



# **Endangered Species Act at the Crossroads: New Directions from Idaho Case Studies**

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- The Idaho Forest, Wildlife and Range Policy Analysis Group was established by the Idaho Legislature in 1989 to provide objective analysis of the impacts of natural resource proposals (see Idaho Code § 38-714).
- The Policy Analysis Group is administered through the University of Idaho's College of Forestry, Wildlife and Range Sciences, Charles R. Hatch, Dean.

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**Policy Analysis Group Reports**

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- No. 3. Idaho Department of Fish and Game's land acquisition and land management program. *C. Wise and J. O'Laughlin* (October 1990).
- No. 4. Wolf recovery in central Idaho: alternative strategies and impacts. *C. Wise, J.J. Yeo, D. Goble, J.M. Peek, and J. O'Laughlin* (February 1991).
- No. 5. State agency roles in Idaho water quality policy. *A.C. Turner and J. O'Laughlin* (February 1991).
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- No. 10. Idaho roadless areas and wilderness proposals. *J.G. MacCracken, J. O'Laughlin, and T. Merrill* (July 1993).
- No. 11. Forest health conditions in Idaho. *J. O'Laughlin, J.G. MacCracken, D.L. Adams, S.C. Bunting, K.A. Blatner, and C.E. Keegan, III* (December 1993).
- No. 12. Grizzly bear recovery in Idaho. *J.G. MacCracken, D. Goble, and J. O'Laughlin* (November 1994).

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## ABOUT THE POLICY ANALYSIS GROUP

**Role and Mission.** The Idaho Legislature created the Policy Analysis Group (or "PAG") in 1989 as a way for the University of Idaho to respond quickly to requests for information and analysis about current natural resource issues. The PAG's formal mission is to provide timely, scientific and objective data and analysis, and analytical and information services, on resource and land use questions of general interest to the people of Idaho.

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## PERSONAL COMMUNICATIONS CITED

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## FOREWORD

Few natural resource issues create as much interest in Idaho as those involving threatened and endangered species. Grizzly bears, wolves, caribou, bald eagles, whooping cranes, salmon, sturgeon, and other rare fish, wildlife, and plants help make Idaho a special place, and future generations of Idahoans could be poorer without them. The Endangered Species Act was devised by the United States Congress to ensure that these species will remain with us. The law requires us to consider and provide for these species in our land and resource management practices. That consideration, on occasion, has significantly altered the way we manage our land and natural resources.

Building on the experience the Policy Analysis Group (PAG) acquired analyzing issues involved in wolf and grizzly bear recovery, and Dr. O'Laughlin's participation on the University Task Force on Salmon and the Columbia River System, the PAG's Advisory Committee suggested that the PAG undertake a broad-based report on the ESA structured around a series of focus questions. Each question was designed to address an issue of concern to Idahoans. Questions addressed informational issues like "What species are on the list and protected in Idaho?" and "What actions are underway to protect and recover listed Idaho species?" to questions that focused on the implementation of the ESA in Idaho. Implementation questions ranged from "Does the ESA mean a shift of management control in Idaho?" to "Where is the flexibility in the ESA?" and "How can the ESA be modified to work better?"

I believe these are questions that Idahoans need to understand and address if they are to be informed participants in the current congressional examination and reauthorization debates about the ESA legislation. It is our intent that this report be a timely and informative document that helps Idahoans effectively contribute to decisions that affect Idaho and its resources.



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## PREFACE

The Policy Analysis Group's mandate to provide credible and unbiased information proved to be particularly challenging with the Endangered Species Act (ESA). The following commentary by the editor of a peer-reviewed journal illustrates why:

This issue of the *Journal of Forestry* is devoted to exploring the many facets of the ESA discussion. Our intent is not to suggest what changes should be made to improve the act's effectiveness and support; rather, we hope readers will become better informed about the ESA and thus better able to participate in the debate and make recommendations....

We were unable to include peer review articles specifically on the ESA as it would have been almost impossible to get three reviewers to agree! (Staebler 1992, p. 4).

I was privileged to write the lead article for that issue of my professional journal on the eve of scheduled ESA reauthorization that is now three years overdue. In it I explained to foresters how the ESA works and what it might become (O'Laughlin 1992). The intent of this report is also policy education, not prescription.

Technical review of the draft of this ESA report resulted in an agreement problem much like that described by Staebler in the *Journal of Forestry*. The ESA involves not only biological knowledge, but also ethical and social problems. The ESA arouses peoples' emotions, making this project perhaps the PAG's most difficult undertaking. It was certainly more difficult than reports analyzing the recovery of individual ESA-protected species such as wolves (PAG Report #4) and grizzly bears (PAG Report #12). Considering the controversial nature of water quality issues (PAG Reports #5, #8, and #9), wilderness issues (PAG Report #10) and forest health issues (PAG Report #11), when I say that ESA issues may be more difficult to analyze impartially, I am saying a lot.

I strive to be open-minded and fair; indeed, fairness is one of the criteria used by reviewers of all PAG draft reports, including this one. I am grateful for the diligent efforts of the contributors and reviewers who helped me with this difficult project (see the **Acknowledgements** section), and hope I have satisfied the concerns and constructive criticisms they expressed during the review process. In some instances I felt it was necessary to incorporate their comments into the report, and these are identified as (name, review comments). For the benefit of reviewers and for your understanding, a qualifying statement from a chapter on endangered species recovery plans in a book on that subject seems appropriate here:

Not all reviewers have endorsed its content, but such is the nature of the process in which we all work in trying to protect and restore endangered species. (Clark and Harvey 1991, p. 161).

Although many people tried hard to help make this report as useful as possible, as PAG director and report author, all errors of omission or commission are my responsibility.



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## SUMMARY AND OVERVIEW

This **Summary and Overview** section consists of the same text that was published separately as a 24-page **Executive Summary**. The three tables referred to in this **Summary and Overview** were included in the **Executive Summary**, but are included here in later chapters.

### Goal of the ESA

The goal of the Endangered Species Act (ESA) is species conservation.<sup>\*</sup> This translates into actions to *identify* all species and subspecies of animals and plants—and populations of vertebrate animals—that face the possibility of extinction, and then *protect* and *recover* the threatened or endangered species.

The law affects many activities throughout the United States on all land ownerships. Although Congress has amended the ESA several times since it was enacted in 1973, the law has retained its basic purpose and protection provisions. Because habitat transformation by human activity can lead to habitat impoverishment for some plants and animals, habitat modification is a key concern of the Act. Determining the effects of habitat transformation on fish, wildlife, and plants involves judgments about land-use practices and the modifications of them required to meet species' needs.

Biological science is relied upon for data to ensure that land and resource management practices do not cause "harm" to species or their habitats. Because the requirements of imperiled species are intertwined with habitat, species' needs sometimes clash with the desires of some humans. The ESA was designed to ensure that imperiled species' needs are met before human wants are fulfilled. Sometimes that assurance is necessary because other laws have not provided the protection Congress intended. For example, federal laws for decades have mandated that salmon in the

Columbia River system are to be treated equitably with other river resources, yet their numbers have dwindled significantly, and they are now protected by the ESA.

The ESA is a bold experiment in reordering the relationship of human and non-human species. Implementation of the Act raises biological issues about how many members of a species there ought to be and where they ought to be. These questions led to the invigoration in the 1980s of a new discipline called conservation biology. (The scientific issues addressed by conservation biologists are briefly reviewed in **Appendix A**.)

ESA implementation also results in social and economic issues being raised about how much it will cost to protect and recover these species, who should pay the costs, and the respective roles of different public and private landowners in providing habitat. Economic development activity in the vicinity of a protected species is not absolutely forbidden by the Act. The ESA is not designed to stop development projects, but to ensure no "harm" is done to the species and that its habitat is not significantly modified in an adverse way. In practice that is not so simple.

### Purpose and Organization of the Report

This report is designed to answer a number of questions about the effects of ESA implementation in Idaho, especially legal requirements that might necessitate modification of existing land and resource management practices. The focus questions that guided the analysis were suggested by a committee made up of leaders of public agencies and private organizations interested in Idaho's natural resources. (See the brief **About the Policy Analysis Group** section on page *i* for further explanation.) These 15 focus questions provide the organizational framework for this report. The Policy Analysis Group develops replies to these questions; short replies are provided in this

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\* Underlining is used throughout this report to highlight terms with specific definitions in the Endangered Species Act (ESA § 3)—the symbol § means section and is used to refer to portions of the ESA. These specific definitions are presented as a Sidebar on page 4 of this **Summary and Overview**. Other unfamiliar terminology appears in the **Glossary** at the end of the report.

**Summary and Overview.** There is a chapter addressing each focus question that provides the analysis supporting the short reply in this **Summary and Overview**.

The report begins with a chapter of **Introduction** that sets the stage for the analysis by briefly reviewing why science cannot address all the ESA questions. It is difficult to overemphasize the importance of habitat in species conservation, and habitat is thus a continuing theme throughout this report. Decisions affecting habitat involve land and resource uses and are thus political. This explains in part why science cannot address all the ESA questions.

The body of the report consists of 15 chapters numbered and titled as focus questions. These chapters could be read in any order, depending on your interest. The report's **Conclusions** are presented in this **Summary and Overview**. A **Glossary** at the end of the report defines terminology that may be unfamiliar; in this **Summary and Overview**, Sidebar S-1 provides essential definitions necessary to understand the ESA. Case studies of species conservation in Idaho are featured in **Appendices** to the report, where salmon protection, bull trout conservation efforts, and grizzly bear recovery plans in Idaho are presented (**Appendices B, C, and D**, respectively). Other Idaho examples, especially the gray wolf and the Bruneau hot springs snail, are scattered throughout the report to illustrate points about ESA implementation in Idaho.

### Focus Questions and Short Replies

All of the following short replies to the 15 focus questions are based on the analysis in the report, as are the **Conclusions** and other discussions presented in this **Summary and Overview**.

**1. How does the ESA work?** The reply to this question explains the means and ends of the Act, rather than an appraisal of its success. A simplified overview of the ESA is presented in Sidebar S-2.

Three words capture the essence of required ESA processes: *identify*, *protect*, and *recover*. The ESA *identifies* species threatened or

endangered with extinction and the critical habitat essential to their survival and recovery; it *protects* the identified species from "harm" and its habitat from significant adverse modification; and it mandates affirmative action by all federal agencies to *recover* the species to the point where the Act's protection is no longer necessary.

Some facts pertinent to the three required ESA processes follow, and are provided to set the stage for a better understanding of the remainder of this analysis.

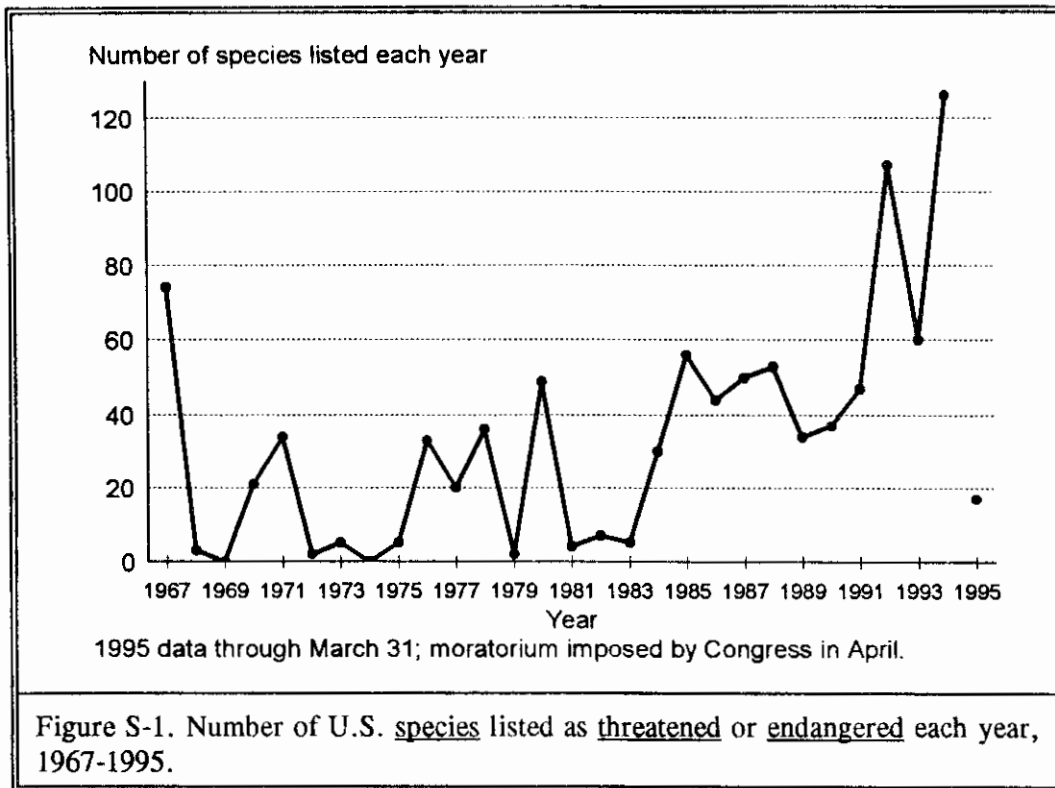
**Identify.**—On March 31, 1995 there were 961 species in the U.S. *identified* and officially listed through rule-making procedures as threatened (202 species) or endangered (759 species); 55% of the listed species were plants (US-FWS 1995b).

There has been a substantial increase in new listings since 1991 (Figure S-1). Part of the increase is explained by the fact that in December 1992, when there were 779 species on the list, the FWS agreed to settle a lawsuit (*The Fund for Animals v. Turner*, Civ. No. 92-800) by adding 401 additional species to the list by September 1996 (see Glitzenstein 1993, Howe 1993).

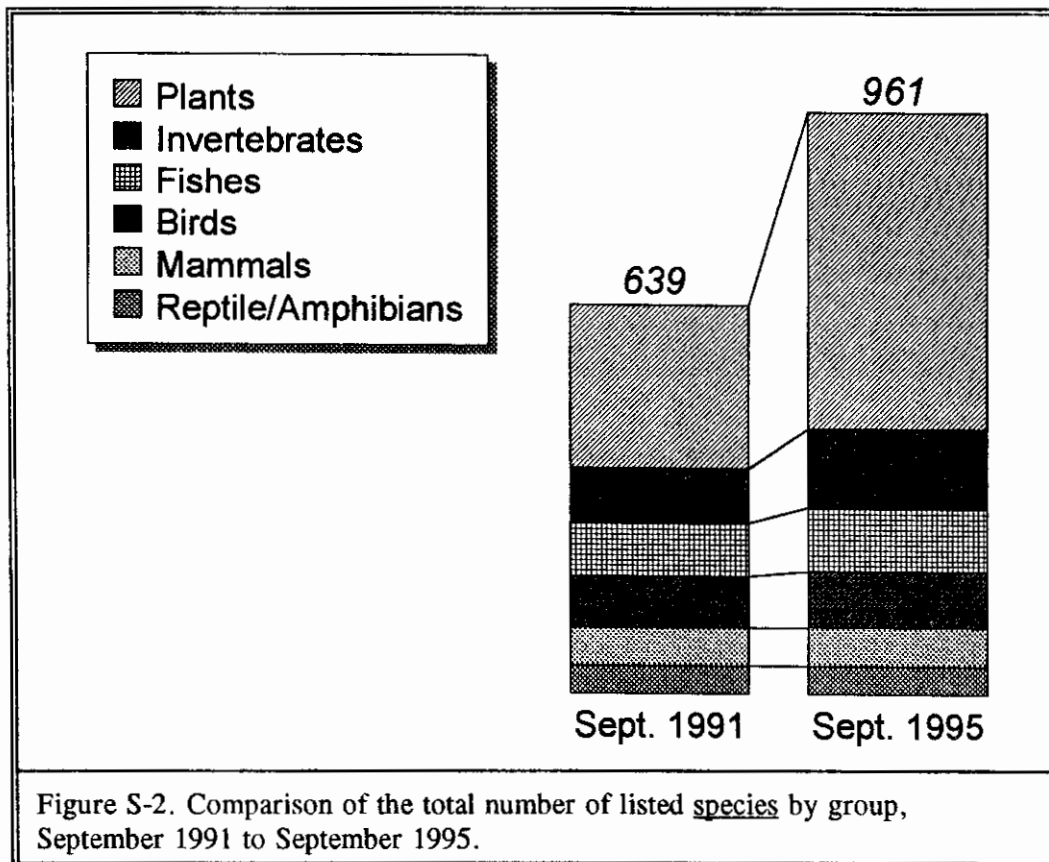
Between September 30, 1991 and March 31, 1995, the list grew by 50%, with increases of 255 plants, 41 invertebrates (snails, clams, crustaceans, insects, and spiders), 18 fishes, 7 birds, and one mammal (Figure S-2). In April 1995 the U.S. Congress imposed a moratorium on new listings, and as of September 30, 1995, no new species had been added to the list, which remains at 961 species.

The ESA requires critical habitat for virtually all listed species to be *identified* and designated through required rule-making procedures that allow economic impacts and any other impacts to be considered. Less than 15% of the listed species have designated critical habitat, which Coggins and Glicksman (1995) describe as putting species' needs above any other land use.

**Protect.**—Species that have been formally identified as threatened or endangered are *protected* by two principal mechanisms. First, section 7 of the ESA prohibits federal agencies from taking actions that would "jeopardize" the species. On federal lands, or on state and private lands where federal permits or funds



Source: Data from US-GAO (1992) and *Endangered Species Technical Bulletin* (March 1994, January/February 1995, and March/April 1995).



Source: Data from *Endangered Species Technical Bulletin* (October 1991 and March/April 1995).

## Sidebar S-1.

## Essential ESA Definitions

The ESA (§ 3) provides specific definitions of the terminology used in the Act. Some of the important definitions essential to understanding the ESA are as follows (underlining added):

- The term "species" includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which breeds when mature.
- The term "endangered species" means any species which is in danger of extinction throughout all or a significant portion of its range other than [certified insect pests].
- The term "threatened species" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- The terms "conserve", "conserving", and "conservation" mean to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which such measures are no longer necessary. Such methods and procedures include ... all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case ... regulated taking.
- The term critical habitat for a threatened or endangered species means—the specific areas ... (I) essential to the conservation of the species and (II) which may require special management considerations or protection.
- The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. [Note: regulations define "harm" to include significant habitat modification.]

Source: ESA (§ 3).

are involved, the facts are that nationwide in the late 1980s and early 1990s, less than 1% of development projects were halted because they posed "jeopardy." This low percentage, however, masks the importance of conflicts that do arise, and it does not include most private land ESA conflicts.

Second, section 9 of the ESA prohibits the take of a species by any individual, except under special flexible circumstances authorized by the Service (see Question 12). The take prohibition includes no significant habitat modification, regardless of whether or not it is critical habitat.

**Recover.**—In April 1995 there were 445 approved plans to **recover** the 961 listed species (US-FWS 1995b). Virtually all listed species are required to have an approved recovery plan; roughly half do not.

**2. Who is responsible for the ESA?** Two federal agencies have the major responsibilities for implementing the Act. The U.S. Fish and Wildlife Service (FWS) is responsible for plants and most animals. The National Marine

Fisheries Service (NMFS) is responsible for most marine mammals—whales, dolphins, porpoises, seals, and sea lions—and all anadromous fish, including salmon, that spawn in fresh water but spend a large part of their lives in the ocean. This report uses the term "Service" collectively to describe both agencies, in part for convenience, and in part to be consistent with federal regulations that use the term "Service" to refer to the two agencies. You must recognize, however, that the FWS has the major responsibility for ESA implementation. Because it is responsible for salmon, the NMFS has recently played an important role in species conservation activities in Idaho.

The ESA recognizes the importance of cooperative relationships between the federal and state governments. The Act makes federal funds available to states that have entered into a cooperative agreement. The Idaho Department of Fish and Game is the state's lead agency for ESA matters. Other federal and state agencies and all private individuals have a responsibility to ensure that their

## Sidebar S-2.

## A Simplified Overview of the ESA

**What?** The ESA replaced two earlier versions of the Act, which did not include the strict procedural requirements that make the ESA the closest thing to an absolute legislative command in public natural resources law (Coggins and Glicksman 1995).

**Why?** To temper economic development activities with adequate concern for the well-being of all species (ESA § 2(a)(1)), the goal of the Act is to recover species threatened or endangered with extinction.

**Where?** The Act applies to all lands and territorial waters of the United States. There is also a provision for listing species in other nations (ESA § 8).

**Who?** The implementing authorities identified in the ESA (§ 3) are the Secretary of the Interior (U.S. Fish and Wildlife Service or the FWS), Secretary of Commerce (National Marine Fisheries Service or the NMFS), and the Secretary of Agriculture (import/export of terrestrial plants). The ESA authorizes these agencies to promulgate regulations to implement the Act.

**When?** The ESA was enacted by Congress in 1973, and since then, Congress has added stipulations that certain procedures must be accomplished within certain periods of time.

**How?** The goal of the Act is species conservation, which means to recover threatened and endangered species. This can be best described by briefly outlining the requirements of the Act (terms with specific definitions in the Act are underlined):

- **Identify** threatened and endangered species and include them on the list of protected species, and **identify** the critical habitat essential to their recovery and designate it as such through rule-making procedures (ESA § 4).
- **Protect** listed species by prohibiting actions that "harm" the species or its habitat. No individual can trade in listed species or their parts without a permit, nor can an individual take species (ESA § 9). Take is broadly defined in section 3 of the ESA, and even more broadly defined by regulations. Federal agencies cannot undertake any action that might "jeopardize" the continued existence of the species, or allow "adverse modification" of critical habitat (ESA § 7). Neither "jeopardy" nor "adverse modification" are defined in the Act. Section 7 is implemented through interagency consultation. The regulatory definition of "harm" is so broad that it is an all-encompassing term for the various protection mechanisms in the Act.
- **Recover** listed species. Federal agencies are obligated not just to **protect** individual members of the species, but to **recover** the species (ESA § 4). The implementing agencies must develop and implement a recovery plan with recovery goals expressed as objective criteria, and include details of specific actions, time lines, and costs.

actions do not "harm" threatened and endangered species or adversely or significantly modify their habitat.

**3. Where is ESA information available?** The two principal sources of information for Idaho citizens are (a) the two field offices of the U.S. Fish and Wildlife Service that cover Idaho (one in Boise, the other in Spokane, Washington); and (b) Idaho Department of Fish and Game, which has a Nongame Office as well as the Conservation Data Center that is responsible for maintaining a database on rare plants, animals, and fish in the state. (Rare species include threatened, endangered, and

other plants, animals, and fish considered worthy of special concern.) Both Idaho Department of Fish and Game offices are in Boise. The National Marine Fisheries Service opened an office in Boise in 1994 to deal with salmon issues in the state.

The focus question in chapter 3 presents a checklist for land managers concerned about their relationship with the ESA. It includes what landowners should do to determine if rare species are on their land, and then what to do if rare species are discovered. The first action is to contact one of the agencies identified above.



**4. What species are on the ESA list and protected in Idaho?** Currently there are 18 species in Idaho on the list of species protected by the ESA. As shown in Table 4-1 (see page 76), protected species in Idaho include three mammals (gray wolf, grizzly bear, and woodland caribou); three birds (bald eagle, peregrine falcon, and whooping crane); four fish (Kootenai River white sturgeon, Snake River sockeye salmon, and the fall and spring/summer runs of Snake River chinook salmon); six snails (five in the middle reach of the Snake River plus the Bruneau hot springs snail); and two plants (MacFarlane's four-o'clock and water howellia).

**5. What actions are underway to protect and recover listed Idaho species?** The ESA requires the Service to develop and implement a plan to recover each listed species. A summary of the status of plans for each of the 18 listed species is provided in the report. Conservation of Snake River salmon involves a high degree of biological, social, economic, institutional, and political complexity. A recovery plan draft released for public comment in March 1995 was more than three years in the making. Grizzly bear recovery involves a recently revised and controversial recovery plan that the PAG covered in detail in another report (MacCracken et al. 1994). Another PAG report focused on gray wolf recovery (Wise et al. 1991), and illustrative examples from it are scattered throughout this report.

**6. What are the prospects for recovering and delisting these species?** After a species has reached the recovery goals stated in the recovery plan, it is to be removed from the protected list. Within the next five years, only one species, the peregrine falcon, is likely to be delisted in Idaho. The status of the bald eagle in Idaho is improving and it was recently downlisted from endangered to threatened not only in Idaho, but throughout the contiguous 48 states. The MacFarlane's four-o'clock is in the process of being downlisted, again indicating improved status. All fish, snails, and the water howellia have been listed for less than five years and it is too early to tell what might happen to them. Perhaps the most

difficult and expensive set of recovery tasks yet faced under the ESA involves Snake River salmon. It appears that woodland caribou and the grizzly bear populations in the northern Idaho panhandle will always have a struggle to maintain their current low population levels. Efforts to reintroduce the gray wolf to Idaho have just begun and it is premature to judge the potential outcome. Attempts to establish an Idaho whooping crane population have been unsuccessful.

**7. What species in Idaho are candidates for ESA listing?** Approximately 135 species in Idaho appear on various federal and state agency lists as potential candidates for threatened and endangered status under the ESA. The Conservation Data Center, which is administered by the Idaho Department of Fish and Game, maintains a data base on these species (see CDC 1994).

**8. What actions are underway to prevent the need to list candidate species?** More important than identifying candidates for potential future listings is to take affirmative actions in the attempt to preclude the need for their listing. This is being done in Idaho.

Under the leadership of the Idaho Department of Fish and Game, the Idaho Conservation Effort was begun in 1994 as an attempt to identify and mitigate the factors involved in the decline of 35 candidate species. After a Habitat Conservation Assessment is completed, a Conservation Strategy is developed through interagency efforts. The end result may be a Conservation Agreement that identifies responsibilities for actions to improve the status of these species, with the hope of reducing the priority of their status as candidates for threatened or endangered listing.

A "short list" of species for which these efforts are underway includes bull trout (see Table 8-1, page 102). The bull trout is a particularly important species because of its wide range throughout the inland Pacific Northwest and the fact that its stream habitat is largely dependant on the condition of neighboring forest lands. Attempts to meet the needs of bull trout in Idaho through the Conservation Agreement approach indicate that

cooperation between agencies, private landowners, and timber operators will be necessary before a successful agreement can be attained. The success of the Idaho Conservation Effort, however, should not be judged by whether or not the needs of bull trout can be adequately addressed through this approach.

**9. What are the major ESA issues?** Five ESA issues are frequently discussed that are central to ESA reauthorization debates in the United States Congress (see Bean 1991):

- The ESA: stunning success or colossal failure?
- The Act's costs: inordinately expensive or miserly cheap?
- The Act needs more balance, but which way?
- Subspecies and populations: does the Act protect too much?
- Does the ESA place animal welfare ahead of human welfare?

Each of these five issues can be argued from opposing perspectives.

The facts pertinent to the success issue are that only one species in the U.S.—the dusky seaside sparrow—has gone extinct since 1973; seven species had recovered enough by the end of 1994 to be delisted (see Table 9-1, page 111). As of September 1992, the status of roughly 10% of the listed species (69 of 711) was improving, 28% were stable, 33% were declining, 2% were thought to have gone extinct, and the status of 27% was unknown (US-FWS 1994g).

On costs, federal ESA expenditures are authorized at roughly \$50 million per year in a budget with total federal expenditures of about \$1 trillion. This figure is misleading, as some ESA expenditures do not show up as budget line items; for example, the expenditures for salmon recovery by the Bonneville Power Administration. Also, the costs of social and economic impacts go beyond budget expenditures but are difficult to quantify, as are benefits of conservation actions. Because Congress declared that species facing extinction "are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people" (ESA § 2), attempting to measure ESA

benefits is not only fraught with multiple problems, but unnecessary under the Act to justify species conservation actions.

The question of balance is closely related to that of the relative welfare of humans and animals; both involve ethical perspectives. In a position paper on the ESA, the National Wildlife Federation (1995), speaking for its 4 million members and supporters, presented a set of legislative proposals for changing the ESA, many of them based on the principle of balance:

The Federation strongly believes that the ESA can and should balance the needs of people with the urgent treatment of a species in danger of extinction. While the principle of balance is inherent throughout the Act, it is not sufficiently explicit. The balancing of needs cannot be left so largely to bureaucratic discretion. Some significant changes in the Act are required to assure that balance is achieved in practice as well as principle. (National Wildlife Federation 1995, p. 9).

Does the ESA protect too much? According to a National Research Council (NRC 1995) committee report that scrutinized the biological science in the ESA, subspecies and populations need to be protected to reduce the risk of extinction.

**10. Does the ESA mean a shift of management control?** Yes. Under the ESA, all other land and resource uses are subordinated to the needs of protected species, and the Service is responsible for seeing that those needs are met. This does not mean that all land and resource management activities must cease, but it does mean that public and private landowners may need to modify current practices. A cooperative approach to consultation and other dealings with the FWS or the NMFS is suggested because these agencies wield considerable power under the ESA to affect land and resource management activities through their decisions as to what constitutes "harm" or "jeopardy" to a protected species, what activities lead to significant adverse habitat modification, and what actions are necessary to recover listed species.

The issue of property rights often comes up in the context of the ESA. Private property is protected by the United States Constitution.

No court has ruled that endangered species protection is a taking of property in violation of the Constitution. Nonetheless, the issue remains an important part of the debate over the power the ESA gives federal agencies to affect land-use regulations.

### ***11. Can the ESA be modified to work better?***

This is the central question in ESA debates. "Better" as it relates to the ESA is a tricky term. This report is careful to avoid arguments about what actions might be taken to strengthen or weaken the Act because those judgments are largely based on value positions. There is strong public support for protecting endangered species, yet criticisms of the ESA are increasing as more species need protection because of conflicts arising from habitat needs and human uses of lands and resources. As a nation we have more than 22 years of experience implementing the ESA, and observers have suggested a wide variety of changes in the Act.

Current ESA issues point to the need to reaffirm the ends and means of the ESA as a public policy. The overdue reauthorization of the ESA by the United States Congress provides that opportunity.

ESA success stories demonstrate the importance of cooperation and the use of the Act's flexibility to accommodate different situations and to manage potential conflict. The key to success is identifying the cause of endangerment to the species and taking action to mitigate the cause. The fundamental ESA problem is providing adequate habitat for species. Habitat can be provided in most cases through cooperative efforts to accommodate the needs of species without complete cessation of land and resource management activities.

***12. Is there flexibility in the ESA?*** The two federal Service agencies that implement the ESA have considerable latitude in determining which species need protection (Eisner et al. 1995). The Service has some discretion to determine what causes "harm" to protected species and significant adverse modification of their habitat. As the definitions of endangered and threatened imply, species listed as endangered are closer to extinction than those that are threatened. In section 4(d), the ESA

gives the Service some flexibility to tailor protection for threatened species through development of special rules governing take.

The principal source of flexibility is the Act's "incidental take" provisions. "Incidental take" permits allow some degree of "harm" to protected species. Through the Act's section 7 consultation process with the Service, these provisions apply to federal agencies, or state and private landowners with a federal connection. In addition, landowners without a federal connection can obtain an "incidental take" permit by developing a Habitat Conservation Plan (ESA § 10).

Implementing agencies have recently become more willing and able to use the existing flexibility in the Act. The uncertainty the ESA creates about permissible public and private land-use activities seems unnecessary and unproductive. The perverse incentives the ESA unintentionally gives non-federal landowners—"shoot, shovel, and shut up" (see Hudson 1993, Polasky 1994, Seasholes 1995)—help no one, least of all the protected species.

***13. Is there an appropriate role for economics in the ESA?*** Economic considerations are dealt with in a limited fashion in the ESA, thus one can assume that economic considerations are appropriate. The issue is where and how economics are considered. There are two prominent possibilities. One is the use of economic incentives such as tax credits to motivate private landowners to provide habitat (see Hudson 1993, Keystone Center 1995, Stone 1995). The other is the use of economic analysis in ESA processes.

Public budget resources for species conservation are limited (Master 1991). Economic analysis offers information upon which choices could be made to allocate budget resources effectively. If the ESA is to include economic analysis, an appropriate role is evaluating the cost-effectiveness of alternative recovery actions and an appropriate place is in the recovery planning process. Costs could include social and economic impacts as well as budget expenditures. As mentioned under the short reply to question 9, attempts to measure benefits as a measure of effectiveness face a multitude of problems.

Effectiveness could be measured as the risk of extinction or probability of persistence; the risk in many cases is irretrievable loss of species, and such analysis is difficult.

**14. What roles should agencies play in the ESA?** One of the major issues debated in 1973 when the ESA passed into law was the appropriate role of state and federal governments, and section 6 of the Act speaks to this relationship. The implementation of the ESA is primarily a federal responsibility.

Cooperation from the states is usually essential in species conservation (Tobin 1990). Both the Western Governors' Association (1995) and the International Association of Fish and Wildlife Agencies (1993) have made explicit recommendations for modifications in the ESA that would give states a more active role. Federal oversight may be necessary to ensure that states are doing what is expected to protect our nation's natural heritage and to manage species that migrate across state, international, and tribal boundaries. Several recommendations for giving the states, tribal, and local governments larger roles in ESA implementation have been offered by the Department of the Interior (USDI 1995a, see also US-FWS 1995c, f).

If species conservation is to be effective, more resources are necessary. There are two approaches. One is to give the Service more funds and personnel, and allow the agencies to determine where ESA implementation needs are greatest. The other is to direct the flow of those resources to various sections of the Act through the budget process. As Tobin (1990) noted, state fish and wildlife agencies have cadres of professional resource managers dedicated to protecting fish and wildlife, and the ESA, through section 6, provides a mechanism to channel resources to the states.

Part of this policy analysis assignment was to determine if Idaho state agency roles are appropriate, given the current ESA. They are. If the ESA is modified to include a greater role for state government, then a special state office to help balance the needs of imperiled species with those of people may be helpful.

Regarding federal agency roles in salmon recovery, based on experience in Idaho the responsibilities for salmon while they are in a

freshwater environment perhaps should be reassigned from the NMFS to the FWS, with the NMFS retaining its responsibilities for salmon while they are in the marine environment. The argument is one of efficiency, and is supported by the elimination of what seems like unnecessary duplication of bureaucratic structure and process.

**15. What alternatives are there for changing the ESA?** Four alternatives are analyzed in the report and summarized in the following section of this **Executive Summary**:

- (1) Leave the ESA alone,
- (2) Repeal the ESA,
- (3) Replace the ESA, and
- (4) Modify the ESA.

There seems to be support from many quarters for modifying how the ESA is implemented. Any suggestion for change is certain to be judged as an attempt to either strengthen or weaken the Act. This report analyzes potential changes that could make the ESA more effective in attaining the goal of species conservation, and reviews several modifications others have suggested as well as some that may be novel. Instead of specific recommendations, the analysis offers a series of questions that should be considered in discussions of modifying the Act. These questions are an important part of the purpose of this report and are listed in a Sidebar in the following **ESA Reauthorization and Process Modifications** section, which also summarizes the analysis of the four alternative approaches to changing the ESA. Following that, the **Conclusions** of the report are presented.

### **ESA Reauthorization and Process Modifications**

The ESA was scheduled for reauthorization by the United States Congress in 1992, a task that had not been accomplished as of October 1995. Reauthorization involves funding the ESA, and also offers an opportunity to debate and possibly modify the ends and means of the Act. Since 1992, a variety of proposals have been offered by interest groups for reforming the ESA during reauthorization, and some have been formalized as congressional bills. Instead of reviewing these proposals, four

general alternatives for reauthorization are presented and analyzed, with most of the analysis focusing on modifications that would clarify ambiguities and promote the goal of species conservation.

**Alternatives Analysis.** How can the ESA work better? That is, what alternatives to current implementation are there for more effective recovery of threatened and endangered species through conservation efforts? There are four views, each representing an alternative approach to the question: (1) Leave the ESA alone—the Act is fine the way it is, and is up to the job of species conservation if more resources are dedicated to that purpose. (2) Repeal the ESA—species conservation as conceived under the ESA causes problems that cannot be resolved, and the Act should be repealed. (3) Replace the ESA—the idea of the ESA is good, but the Act is so flawed it should be replaced with something else. (4) Modify the ESA—the intention of the ESA is laudable and necessary, the statute is flexible enough to do what ESA critics want, but could use some changes to ensure that species conservation is carried out effectively and is balanced with other socially desirable ends.

**(1) Leave the ESA alone.**—Policy is about choice, and to the extent that the ESA is a public policy that must compete for limited budget resources with other programs and policies that society has decided are worthwhile, a choice must be made. Mann and Plummer's (1995c) book *Noah's Choice* presented documented case histories and examples that the ESA offers no choice. The Act mandates that we attempt to save all the threatened and endangered populations of species in the United States. This is like Noah following God's command to put all the animals on the Ark to save them from the great flood. *Noah's Choice* is no choice at all. Similarly, the ESA offers no choice. To do nothing to modify the ESA is to accept the current situation.

The idea of saving everything seems an unattainable goal for many reasons (Melquist 1995). Conservation biologist J. Michael Scott (Scott et al. 1991, p. 283) wrote, "Regardless of how we feel about the value of these

species, social, economic, and biological realities preclude saving them all." They said there is simply not enough money to do everything that needs to be done (see also Master 1991). This implies the need for making a choice.

In *Science* magazine, a group of prominent biologists (Eisner et al. 1995, p. 1232) said, "New approaches with respect to both the science and economics of protecting biodiversity could significantly improve the performance of the ESA." Murphy (1995, p. 8), a conservation biologist, said, "Simply stated, the science in the Act is rather straightforward, but putting that science into action is a policy dilemma of the highest order."

A scientist who helped write the ESA and a representative of an Idaho citizen conservation group both told Barker (1995) that the ESA has been used too much for purposes other than it was intended. However, they both emphasized the crucial role of the ESA in protecting species and ecosystems. Species conservation requires us to look beyond building dams, harvesting timber, or improving crop yields and thinking about ways these and other activities can be made compatible with our fellow species (Kohm 1991). The debate over the ESA is likely to be extended and bitter just for the reason that the ESA goal has such wide support (Kohm 1991).

Now may be an appropriate time for a change in the ESA. Rolland A. Schmitt, director of the NMFS, observed that the ESA needs a good overhaul. He said, "The legislation is 22 years old. It is time to be modernized. The buzzword is streamline and make more effective. I can agree with them" (Wickliffe 1995a). Hank Fischer, spokesperson for Defenders of Wildlife in the northern Rocky Mountains, said, "I don't fear change in the Endangered Species Act. We've been living with this law for 20 years. It's hardly realistic to think we'd get it right the first time" (Larmer 1995a).

**(2) Repeal the ESA.**—Getting rid of the ESA is not given serious consideration in this report. Public opinion polls show strong support for the idea of species conservation. However, as Senator John Chafee (R-Rhode

Island)—Chairman of the Environment and Public Works Committee that through a subcommittee chaired by Senator Dirk Kempthorne (R-Idaho) has jurisdiction over the ESA—said during a June 1995 field hearing on the ESA in Lewiston, Idaho, "while the ESA will be amended, it is safe to say that it will not be repealed or gutted. Most Americans ... support the conservation of fish and wildlife and maintenance of a healthy environment. However, they want our environmental laws to be less burdensome and more effective" (Titone 1995a).

**(3) Replace the ESA.**—This alternative involves replacing the ESA with something else. Two different ideas are often mentioned: (a) supplementing the ESA with a new policy for protecting biological diversity more broadly, or (b) comprehensive revision of the entire ESA.

(a) An Endangered Ecosystems Act that would protect areas of land rather than species is often mentioned as a needed change in the way biological diversity is to be protected. Conservation biologists view this approach as a complement to, rather than replacement of, the ESA. The current ESA recognizes the importance of protecting ecosystems, but the mechanisms of the Act protect species and the habitat a particular species needs to survive. Ecosystem protection is a broader concept than species protection, and should be considered as a separate policy.

(b) A comprehensive revision of the entire ESA would retain the Act's basic purpose of species conservation, but replace the current definitions, mechanisms, and processes of the Act. The book *Noah's Choice* seems to support this alternative, but Mann and Plummer (1995c) stop short of offering an alternative to the current ESA. One might therefore conclude that Mann and Plummer's alternative to *Noah's Choice* is to repeal the ESA, not replace it with something else. However, Mann and Plummer (1995c) offer two noteworthy ideas. One is the notion of a biodiversity trust fund (see Hudson 1993, Keystone Center 1995 for further discussion). The other is a national dialogue on the importance of protecting biological diversity. Our nation had that dialogue 22 years ago when the ESA was passed, and has revisited

the issue several times since in reauthorization and amendment debates. There seems to be no evidence of an erosion of a national commitment to the goal of the ESA. If there is to be a national dialogue on biodiversity protection, it should be based on a comprehensive reexamination of the ends and means of not only the ESA but also other policies (such as the National Forest Management Act) that deal with the effects of habitat modification on other species we share the planet with.

**(4) Modify the ESA.**—This fourth alternative involves incremental modifications or changes to the existing ESA. Most of the effort in analyzing alternatives is focused here and presented in the following section.

**Process Modifications.** The fourth alternative involves analysis of modifications to the ESA to make the Act more effective in attaining the goal of species recovery. This report analyzes many issues associated with implementation of the ESA. Changes in the law have been endorsed by prominent biologists (Eisner et al. 1995), a National Research Council committee of scientists (NRC 1995), the Secretary of the Department of the Interior (Barker 1995), a federal agency director (Schmittgen of the NMFS, see Wickline 1995a), and the National Wildlife Federation (1995).

A mechanism of choice could be installed in the ESA without defeating what many commentators, including the National Research Council committee (NRC 1995), read as the goal of the ESA—recover threatened and endangered species. The recommendations of the NRC (1995) committee report on *Science and the Endangered Species Act* for changes in the law are based on biological science and emphasize the importance of habitat. This analysis builds on that and incorporates social sciences, which the NRC was specifically charged not to consider, but nonetheless concluded are necessary for an effective species conservation program.

As changes to the Act are deliberated, some issues will draw attention, and others will not. The most effective ESA policy will be one that comprehensively addresses the full range of species conservation issues. The wide range of process-related issues analyzed in this report

are summarized in this section and presented in Sidebar S-3 as questions related to ESA functions. This list should be fully considered during discussions of potential changes. Further explanations of some of the points presented in Sidebar S-3 follow.

**Listing.**—It is widely recognized that decisions about which species ought to be afforded protection under the Act should be made based only on the best available biological data. There has been some controversy about what a species should be. The report of the National Research Council committee (NRC 1995) supports the current ESA approach of reducing the possible threat of extinction by protecting subspecies and distinct population segments of vertebrate species that might be abundant in some locations and rare in others. The scientific aspects of the debate about what a species is under the ESA affirm the need to protect subspecies and populations (NRC 1995).

**Protection.**—Protection against take (or "harm") is afforded to individual members of the species, unless an exception is granted by the Service with an "incidental take" permit, or through the Endangered Species Committee (or "God Squad") exemption process, which is cumbersome (Albritton 1994). The safety-valve aspects of the committee are valuable (Yaffee 1991), but a different process could potentially alleviate some conflicts.

Under the ESA, state agencies and private landowners may not use the formal consultation process with the FWS or NMFS to obtain permission to take a species unless their proposed activities involve federal permits or federal funds. This places a financial burden for species conservation planning on state and private entities that do not have a federal connection because they must prepare environmental assessments under the National Environmental Protection Act.

Habitat protection on non-federal lands is arguably a legitimate purpose of federal regulatory efforts under the ESA. As things are, the Service protects all habitat through the regulatory "harm" definition in the take prohibition, rendering critical habitat protection redundant (Bean 1983, Rohlf 1989, Houck 1993). Less than 15% of the listed species have designated critical habitat;

virtually all are supposed to. If critical habitat is to be designated, perhaps it should be part of the recovery planning process, not part of the listing process as it currently is. Critical habitat can be designated after biologists have determined how many members and populations of a species (to include the various subspecies and distinct population segments of species) are necessary to attain viable populations with reasonable certainty of their continued existence. Once biologists have made such a determination, then the search for existing and potentially suitable critical habitat can commence. If existing critical habitat on federal land is inadequate then perhaps state and private land should be considered.

**Recovery.**—Recovery plans need more attention than they have been given. Approximately half of all listed species do not have an approved final recovery plan. The lack of emphasis may result from a lack of resources. Although strictly biological analysis could be used to determine how many members of a species are necessary to attain a reasonable certainty of their continued existence as viable populations, that is not always how recovery planning is done now (Tear et al. 1993, 1995; Scott et al. 1995). As stated above, critical habitat could be designated during the recovery planning process rather than the listing process. The Service now is required to enumerate budget expenditures for recovery actions in the recovery plan, making this the logical place for any and all economic analysis to be performed. Such analysis could be done after a biological recovery goal has been established, and critical habitat identified in the recovery plan. The financial, economic, and social costs of critical habitat designation could then be identified, and the actions and associated expenditures to recover the species and mitigate factors causing endangerment could be identified by interdisciplinary, interagency, and intergovernmental teams of biologists, resource managers, and economists, along with affected private parties.

Only a small portion of the Service's current budget is devoted to recovery planning, few recovery plans have been produced, and plans are treated as advisory. Based on analysis, a more effective strategy would involve

## Sidebar S-3.

## ESA Process Modification Questions and Issues

*Listing*

- What is a species?
  - Is full species, subspecies, or distinct population segments the appropriate level of analysis to avoid extinction?
- Who should decide what species are to be protected and recovered under the ESA?
  - Should there be a formal peer review process?
- What is the threshold level between endangered and threatened species status?

*Protecting Species*

- What is "jeopardy"?
- Is "jeopardy" determination designed to collectively protect all the members of a species, and the take prohibition designed to protect individual members of a species?
- What is "actual injury" to a species?
- How broad should take protection be? That is, should take include habitat protection under the "harm" regulation?
- Should there be modifications to the current exemption process?

*Protecting Habitat*

- What is the meaning of "ecosystem conservation" (ESA § 2(b)) in relation to actions for species habitat protection?
- What is the appropriate mechanism for protecting habitat under the ESA?
  - "Adverse modification" of critical habitat?
  - Take as "harm" and "significant habitat modification"?
  - "Jeopardy" as "harm"?
- Is it necessary to protect habitat that is not essential for species recovery? (That is, what is the reason for protecting habitat that has not been designated as critical habitat?)
- Should critical habitat designation include economic impact analysis as it currently does, or should it be based only on the biological needs of protected species?
- When during ESA processes should critical habitat be designated?
  - Listing (as currently required) or recovery planning?

*Interagency Consultation*

- Is a "jeopardy" determination necessary? That is, what protection does the "jeopardy" prohibition provide in addition to "adverse modification" of critical habitat, and no taking individual members of species?
- Should program- or plan-level activities, as well as project-level activities, continue to be subject to section 7 consultation?
- Should consultation be available to all private landowners?

*Recovery Planning*

- Should recovery plans continue to emphasize target population goals rather than mitigation of the factors causing endangerment?
- Should a recovery plan be considered advisory by the Service, when the ESA (§ 4(f)(1)) states that "the Secretary shall develop and implement plans"?
- Should a recovery plan be considered a "major federal action" and thus subject to the National Environmental Protection Act (NEPA)?

*Agency Responsibilities*

- Should state and private landowners continue to be required by the U.S. Fish and Wildlife Service to do NEPA analysis (see US-FWS 1994c) in order to obtain an "incidental take" permit (ESA § 10)?
- Should the U.S. Fish and Wildlife Service and the National Marine Fisheries Service be authorized to write regulations to implement the ESA without input from a Committee of Scientists? (The U.S. Forest Service was required to have such a committee before the agency wrote regulations to implement the National Forest Management Act.)
- Should the National Marine Fisheries Service continue to have the authority to determine whether land and resource management activities cause "jeopardy" to salmon in Idaho streams, the nearest one being hundreds of miles from a marine environment? (That is, should the U.S. Fish and Wildlife Service do section 7 consultations for all species in Idaho and thus avoid duplication of effort?)
- Should states be allowed to develop take protection guidelines if they have a cooperative agreement in place, as per the language in the ESA (§ 6(g)(2))?
- How can more funding be made available to the states for implementing ESA section 6 cooperative agreements?



the following steps. Tasks for biologists to perform for each population segment and subspecies within the full species and full geographic range are:

1. Identify factors causing endangerment;
2. Identify alternative means to mitigate factors causing endangerment;
3. If habitat impoverishment is a factor causing endangerment, then identify critical habitat on federal land and then, if essential, on non-federal land;
4. Perform viability analysis for various mitigation alternatives to determine the probability of persistence of the species, both in the short- and long-term.

When biologists have completed these tasks, economists and social scientists could then begin to work with them to:

5. Identify the costs of mitigation alternatives; and
6. Identify the economic and social costs of critical habitat designation.

The ESA gives the Service the responsibility for implementing the recovery plan as well as developing it. Therefore an argument can be made that the recovery plan draft is a "major" federal action, and thus subject to the National Environmental Policy Act of 1969 (NEPA), the cornerstone of all our environmental laws except the ESA. The two main features of NEPA are interdisciplinary analysis and public participation. If the recovery plan were subject to NEPA, then several features absent from current processes would be installed.

Making recovery plans NEPA-like would:

- eliminate rule-making procedures for critical habitat designation,
- require interdisciplinary analysis of recovery plan alternatives and impacts, and
- require public participation.

NEPA, however, also adds more procedural requirements and thus more opportunities for litigation (M. Feldman, review comments) and may dilute the substance of ESA (E. Franz, review comments). Nevertheless, if the ESA-required recovery plan were made NEPA-like, it could be a mechanism of choice, as Souder (1993) suggested.

There are many reasons to reconsider the way recovery planning is currently done. The following questions need to be asked:

- ▶ Should all subspecies and population

segments within a full biological species be included in one plan?

- ▶ Should risk assessment be included as part of population viability analysis? If so, what is the appropriate probability of persistence, and for how long?
- ▶ Should a range of alternatives for mitigating the factors causing endangerment be included?
- ▶ Should impact analysis of alternatives to mitigate the factors causing endangerment be included?
- ▶ Should public participation be included, and if so, how?

Carefully considered replies to these questions will no doubt identify some features of the ESA that could be modified. Some of the modifications may require that the Service take on new tasks, and the Service may be expected to say that increasing its task load will require additional resources.

If it is not possible to recover all species everywhere, then a system of priorities needs to be built into the ESA. To do that, a complete set of recovery plans needs to be developed and someone asked to determine which ones need to be done now, and which ones can wait for awhile. However, recovery plans have been approved for about half the listed species, and most of them do not have enough information to facilitate making such choices. A multispecies or ecosystem approach might reduce the amount of information needed.

**Agency responsibilities.**—The principal issues in agency responsibilities concern the respective roles of state and federal agencies in species conservation, as well as the role of private landowners. Specific to Idaho is the question why the NMFS has a responsibility in Idaho—what advantages are there to having one agency protect the entire life cycle of salmon in relation to the costs of duplicating bureaucratic structure and the interagency consultation process of the FWS?

Schmitt, director of the NMFS, believes states should be allowed to take a major role in the development of recovery plans, and even in deciding what species are to be listed. He also favors including non-federal parties in the section 7 consultation process (Wickline 1995a).

Species conservation is a difficult task for understaffed and underfunded agencies. There are two ways around that. First, give the Service more resources. Second, give non-federal entities a larger role in species conservation. As long as federal agencies have the sole responsibility for implementing the Act, as is the current case, the role of the states and private sector will continue to be subordinated to the federal role.

If that is to change, one approach is an oversight role for federal agencies, with state agencies performing the tasks in gathering and analyzing data to support listing, to protect imperiled species and their habitats, and to plan and implement recovery actions. States do much of this now, except for listing, through section 6 funding (Melquist 1995), but a more formal arrangement might be more effective. The Clean Water Act provides a different model of federal/state cooperation than the ESA does, relying on federal oversight more than direct implementation. The U.S. Environmental Protection Agency is responsible for seeing that states implement the provisions of the Clean Water Act. The states recognize the importance of not only clean water, but also control over water resources that would be forfeited to the federal government for failure to implement Clean Water Act requirements.

It is worth considering whether more money made available to the states through section 6 might be more effective and more efficient than building the federal fish and wildlife regulatory bureaucracy. The private sector cannot be ignored because of its role as the nation's largest landowning sector. Incentives to encourage private landowners may be more effective than a regulatory approach, and states may be able to provide those better than the federal bureaucracy (W. Melquist, review comments).

### ***Recent Policy Changes in ESA***

***Implementation.*** During 1994 and 1995 President Clinton's administration has attempted to respond to some of the criticisms regarding the implementation of the ESA by establishing or changing regulatory policies. Some of these changes have been formally addressed through the rule-making procedure

while others have been policy statements and memoranda. These changes follow in chronological order.

***July 1, 1994.***—The FWS and NMFS published a series of policy statements in the Federal Register that outlined six new policy directives (59 *Fed. Reg.* 34270-74 [July 1, 1994]):

1. independent peer review will be solicited on listing recommendations and draft recovery plans;
2. Service biologists are required to gather, review, and evaluate information from a variety of sources prior to undertaking listing, recovery, consultation, and permitting actions;
3. the Service will identify, to the extent known at the time a species is listed, specific activities that will and will not be considered likely to result in a taking violation of section 9 of the ESA;
4. the Service will: (a) diversify areas of expertise represented on a recovery team, (b) develop multiple species plans when possible, (c) minimize the social and economic impacts of implementing recovery actions, (d) involve representatives of affected groups and provide stakeholders the opportunity to participate in recovery plan development, and (e) develop recovery plans within 2½ years after final listing;
5. the Service will incorporate ecosystem considerations in ESA activities regarding listing, interagency cooperation, recovery and cooperative activities; and
6. the role of state agencies in activities undertaken by the Service under authority of the ESA is outlined and clarified.

***December 21, 1994.***—The FWS and NMFS published two notices of availability for draft documents and a draft policy (59 *Fed. Reg.* 65780-84 [December 21, 1994]). One of the notices of availability was for a draft guidance for candidate species. The purpose of this document is to provide policy and guidance to promote efficiency and nationwide consistency within the Service in identifying species as candidates for listing, assessing and monitoring their status, and seeking opportunities to stabilize and recover them before listing becomes a high priority. This draft document

has not been finalized and may be changed substantially due to the elimination of Category 2 for candidate species (see *July 1995* below).

The second notice of availability was for a preliminary draft handbook for habitat conservation planning and "incidental take" permit processing. This draft document provides internal policy and guidance for conducting the "incidental take" permit program under ESA section 10(a)(1)(B), and documents procedures to promote efficiency and nationwide consistency within and between federal agencies. The final document is in progress at this writing.

The December 21, 1994 draft policy was regarding the recognition of distinct population segments of vertebrate fish or wildlife under the ESA. The Service proposes to adopt a policy to clarify their interpretation of the phrase "distinct population segment of any species of vertebrate fish or wildlife" for the purposes of listing, delisting, and reclassifying species under the ESA. The draft policy is being finalized at this writing.

*March 1995.*—The Service announced a list of 10 principles that will guide changes to be made in ESA implementation (see US-FWS 1995c). Some of these principles have been implemented. Others can be implemented through regulatory change, whereas others may require statutory change. The 10 principles are:

1. Base ESA decisions on sound and objective science.
2. Minimize social and economic impacts.
3. Provide quick, responsive answers and certainty to landowners.
4. Treat landowners fairly and with consideration.
5. Create incentives for landowners to conserve species.
6. Make effective use of limited public and private resources by focusing on groups of species dependent on the same habitat.
7. Prevent species from becoming endangered or threatened.
8. Promptly recover and de-list threatened and endangered species.
9. Promote efficiency and consistency.
10. Provide state, tribal, and local governments with opportunities to play a greater role in carrying out the ESA.

When Secretary of the Interior Bruce Babbitt outlined this plan to reform the ESA before a U.S. Senate subcommittee, he emphasized flexibility (Barker 1995).

*July 1995.*—Director Beattie of the FWS made a major ESA policy change by memorandum when she abolished Category 2 of candidate species. This change has not been widely reported, and it is unclear at this writing how it will affect listing policy.

*July 20, 1995.*—The FWS proposed a rule that would exempt certain small landowners' activities from ESA section 9 take prohibitions for threatened species and seeks to establish an additional general exemption for activities that are conducted in accordance with a state-authorized or state-developed habitat conservation strategy for a threatened species (60 *Fed. Reg.* 37419 [July 20, 1995]). The rule has not been finalized at this writing.

*August 4, 1995.*—The FWS and NMFS proposed a rule that establishes an alternative ESA section 7 consultation process for the U.S. Forest Service and the Bureau of Land Management. The proposed rule encourages consultation well before project-level decisions are made and provides a framework for consultation on program-level or ecosystem-level decisions, as opposed to project-level decisions (60 *Fed. Reg.* 39921 [August 4, 1995]). The rule has not been finalized at this writing.

*August 31, 1995.*—The FWS and NMFS announced a joint policy designed to enhance the participation of Native American or tribal governments in species conservation programs.

**Choosing the Future.** Regardless of what happens to the ESA in the current reauthorization, the same issues are likely to resurface again in the future. Revising the ESA requires thoughtful attention to the cause of ESA problems, most of which stem from habitat deprivation.

Secretary of the Interior Bruce Babbitt said he hopes that ten years from now we will not be thinking quite so much about endangered species problems (Cuscela 1993). If that is to happen, it seems reasonable to take care of what we have. If we cannot save everything (Master 1991, Scott et al. 1991, Melquist 1995), some difficult choices about priorities

are necessary.

Which species should be saved and at what cost? The ESA does not allow these questions to be asked, and there are no policy choices. We must save them all and, as the United States Supreme Court ruled in *TVA v. Hill* (437 U.S. 153, 184 [1978]), we must save them "whatever the cost." Uncertainty arises because difficult choices that involve modifying or curtailing land-use activities to avoid habitat impoverishment must be made. These are important social choices for which biological analysis is necessary, but insufficient.

There are two options for incorporating choice into the ESA. One is to replace the current ESA with something else. The other is to retain the basic purpose and structure of the ESA, and refine its implementation through changes in ESA processes.

The real ESA policy is not in the statute or regulations, but is made in the implementation process (Brewer and Clark 1994). The real impact of the ESA is on the land, and this report analyzes what others have observed about how ESA issues have been handled as they arise following implementation. The conclusion is that certain features of the ESA could use some modification. The ESA requires federal agencies to try to save everything, whatever the cost. The Service has extended its scope to private land through regulatory powers, which the United States Supreme Court ruled is not beyond what Congress authorized the agencies to do (*Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 115 S.Ct. 2407 [1995]).

By empowering organizations other than two federal regulatory agencies with responsibilities and resources and by including other disciplinary information as a supplement to biology, ESA implementation can become more sensitive to social issues without forfeiting biological goals. However, the federal regulatory agencies need to maintain oversight authority. Resource management issues are more and more about trusting individuals and institutions. Resource management decisions are governed by our institutional arrangements for land and resource control embodied in the concept of

property rights and ownership. We can abide by existing arrangements or change them. The ESA is forcing us to examine these institutional arrangements. Congress can decide if change is warranted.

Two realities seem to become evident from this analysis: (a) ESA implementation can be improved by a workable choice mechanism, and (b) as the ESA is currently written and implemented, it behooves everyone to keep species from reaching the point where they need to be added to the list in order to avoid having to deal with the ESA. This second point may serve as an incentive to protect species (E. Franz, review comments). Many state and federal agency employees and private landowners in Idaho are working hard to keep species from being listed through cooperative efforts with the federal regulatory agencies.

## Conclusions

When the United States Congress passed the ESA in 1973, the people of the nation were asked to become more sensitive to non-human organisms and their needs; furthermore, the Act mandates that we provide for them—all threatened and endangered species, everywhere they exist. The ESA does not stop all economic activity in the vicinity of a listed species, but usually requires modifications of existing practices.

Questions of how much room each species should be given, and what cost human society should bear to protect them from extinction, will always be with us (O'Laughlin 1992). As long as we have a policy that mandates species conservation without explicit regard for costs, as the ESA does, we should expect actions that promote the continued existence of species in as many areas as biologists think are necessary and feasible (MacCracken et al. 1994), regardless of non-biological impacts.

ESA implementation results in the protection of species and habitats wherever biologists think it is necessary. ESA issues have focused on the adequacy of knowledge that supports these decisions, and the lack of what some people view as adequate consideration of social and economic impacts. Attention to only biological factors is what Congress intended in 1973, and amendments since then have not

substantially altered the biological focus of the ESA.

As Mann and Plummer (1995c) pointed out, there are good reasons why humans have modified natural environments. We can protect some habitats as natural areas, and we have land-use designations designed to protect parks and wilderness areas for their natural and scientific values. If we as a society decide to add more lands to these systems, we can do so. On other lands, current practices on habitats essential for imperiled species (that is, critical habitat as defined in the ESA) need to be adjusted to species needs. In their monograph on endangered ecosystems, Noss et al. (1995) seem to agree. The key is identifying those essential habitats, and little effort has been expended in this direction, even though the ESA requires it in the designation of critical habitat.

Congress has modified the Act through the amendment process several times to accommodate problems that arose. The flexibility and discretion in the ESA gives agents of the Service authority to do what they think is right. There is no consensus on the issue of whether or not the Service has abused its authority to affect land-use decisions, but there can be little doubt that bureaucratic and legal decisions have been made that impact private land-use activities as well as override other public policies that allow other uses of federal lands. Support for lessening these impacts is reflected in several changes in ESA policy announced by the Secretary of the Interior within the past year or so, such as exempting private landowners with less than 5 acres from the ESA under some circumstances (see the *Recent Policy Changes in ESA Implementation* section above). These adjustments in ESA implementation may or may not require statutory changes, which Congress will determine as it debates ESA reauthorization.

What will Congress do about the ESA? There are no easy biological, economic, social, political, or legal answers, so we should not expect easy policy fixes. Ecosystem-level protection has a potential to avoid some species conservation problems in the future, but the ecosystem-based approach has not yet been adequately developed. Even with

ecosystem-level protection, the ESA will still be necessary to protect the most endangered elements of biological diversity. A shift in focus to habitat protection and recovery planning is likely to make the species conservation goal of the ESA more attainable while reducing uncertainty. This may require additional budget resources directed at specific ESA tasks.

**ESA at the Crossroads.** A crossroads is an intersection; in this context it is the juncture of the past and the future. Human and non-human species are at the ESA crossroads now, and have several routes to choose from. The ESA route we have been on for 22 years has non-human needs on a collision course with human desires. The ESA was designed to alter that course and give non-humans the right-of-way. In some cases this ideal has been attained without major problems, but the needs of species that cover large areas, such as in the Pacific Northwest, have caused some pile-ups—some call them train wrecks—at the crossroads. The causes of these collisions are species' habitat needs in conflict with perceived human needs. How the ESA could be modified to change this situation is a major focus of this analysis.

Analysis of experience in Idaho indicates there are two keys to making the ESA more effective: (a) learning how to use the existing flexibility in the Act; and (b) developing cooperative relationships among different agencies, and between agencies and the public.

Rather than waiting for the number of members of a species to get low enough to worry about extinction, a more effective strategy would be to identify potential problems and mitigate them before it becomes necessary to invoke the ESA. If that cannot be done through cooperation, then the ESA with its protection and recovery mandates becomes necessary. Even then, a strategy based on cooperation and flexibility would approach the situation with sensitivity to all parties, non-human and human alike, and craft solutions based on local situations. A cooperative and flexible strategy depends on parties working together towards effective plans and actions rather than at cross purposes.

Does the current ESA have the latitude to

allow consideration of a cooperative and flexible strategy as a route to avoid species extinction? If the ESA is to be effective, this is the question to be asked. Debate would center on how we could save species more effectively by putting limited species conservation budget resources where they will do the most good, which implies a mechanism of choice that is currently absent in the ESA. The solution in most cases is providing adequate habitat.

In Idaho, many people are taking actions that will not only solve existing problems, but also keep new problems from arising. This report is designed to help move in that direction. The new directions based on ESA implementation in Idaho include approaching species conservation problems by using the flexibility in the current Act, and by adopting a spirit of cooperation rather than confrontation by all parties.

## INTRODUCTION

A crossroads is an intersection and the Endangered Species Act (ESA) is at such a juncture. Today we are at the intersection of the past with the future. We can continue in the current direction we have been going or choose a different route. It is not possible to turn around and go back the way we came. Humans have the ability to learn from where we have been and what we have done, and use that information to chart our direction into the future. The quality of our future is related to that of the plants and animals with whom we share the planet. As we begin the journey, let us first check the rear view mirror.

Coggins (1991), a law professor, succinctly described the ages-old relationship between human and non-human species:

Throughout most of human history, animals (like trees) were thought to exist only to support human life in ways that humans determined. In Genesis, God commanded Man to assert dominion "over everything that moves." This injunction has been observed much more closely than other biblical lessons. (Coggins 1991, pp. 63, 72).

The ESA partially dissolved that injunction when Congress passed it into law in 1973. The Act recognizes that species have many values worth protecting—"esthetic, ecological, educational, historical, recreational, and scientific" (ESA § 2(a)(3))—but the legal language of statutes does not effectively capture the essence of the new relationship between humans and non-humans. In *A Sand Country Almanac*, Aldo Leopold (1949) described its significance:

For one species to mourn the death of another is a new thing under the sun. The Cro-Magnon who slew the last mammoth thought only of steaks. The sportsman who shot the last [passenger] pigeon thought only of his prowess. The sailor who clubbed the last [great] auk thought of nothing at all. But we, who have lost our pigeons, mourn the loss. Had the funeral been ours, the pigeons would hardly have mourned us. In this fact ... lies objective evidence of our superiority over the beasts. (Leopold 1949, p. 117).

The ESA no longer allows us to ignore the impact of our activities on the environment and

the diversity of other biological units called species. In the March 1995 *National Geographic* magazine cover story, Chadwick (1995), a freelance writer educated in wildlife biology, described Congress' idea for the ESA:

Based on the assumptions that each life-form may prove valuable in ways we cannot measure and that each is entitled to exist for its own sake as well, the act gave the federal government sweeping powers to prevent extinction. Here was nothing less than a rudimentary bill of rights for nonhumans, an attempt to guarantee a future for as many as possible, even if doing so required real sacrifice on our part....

As the world's most potent single piece of environmental legislation, the ESA is reshaping the way our society lives upon the land, and it is fueling bitter debate over economic balance, nature's balance, property rights, and the limits to growth. (Chadwick 1995, pp. 7, 9).

Since 1973, if a species is listed as threatened or endangered, the ESA offers protection to the species and mandates that it be recovered to the point where it is no longer imperiled with extinction. In 1978, the United States Supreme Court interpreted congressional intention to mean the federal agencies must do this "whatever the cost" (*TVA v. Hill*, 437 U.S. 153, 184 [1978]). There is no choice except for the seldom-convened cabinet-level Endangered Species Committee (ESA § 7(e))—widely known as the "God Squad"—that has the power to exempt a federal project from the ESA. Yaffee (1991) described the committee's role as a "political safety valve." The existence of the "God Squad" thus indicates that there might be a choice mechanism in the Act. However, the committee's makeup of six cabinet-level officials and its difficult functional design (Albritton 1994) ensure it will be used infrequently.

To a great extent, species recovery is a biological consideration, and to a great extent ESA implementation has focused on species' biological needs. The habitat needs of species, a biological consideration, often conflict with land-use practices and resource management activities, raising highly charged social, economic, political, and institutional questions such as those Chadwick mentioned in the above quotation. From one point of view the

principal ESA issue is this: As the agencies go about the business of protecting species and implementing plans to recover them, is there a place for consideration of the non-biological components of land-use issues? As the law stands now, this may occur in a limited fashion during consultation with the Service. The ESA requires an enumeration of budget expenditures for species conservation activities, but does not allow us to ask what the social and economic costs to protect species might be. From another point of view, the principal ESA issue is whether the law can save endangered species.

As human populations grow, additional pressures will be put on all species and their habitats. Our society is not expected to increase as rapidly as others, but we will add tens of millions of United States citizens in the next century. The ESA issues of the future depend on the policy choices we make today in our government institutions. Many people are calling on science to inform those choices.

The often-quoted words from Aldo Leopold's (1949) essay "Round River" are in the background as we check the rear view mirror once more:

The last word in ignorance is the man who says of an animal or plant: "What good is it?" If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering. (Leopold 1949, p. 190).

### Science, Policy, and the ESA

In his book *Saving America's Wildlife*, Dunlap (1988), a historian, observed that humans have always been uncertain about our relationship with the rest of the natural world, and have looked in various places for guidance. Whereas our ancestors spoke of animating spirits or God's personal intervention, today we speak in scientific terms and invoke such concepts as ecosystems and predator-prey interactions. We have, according to Dunlap (1988), replaced one set of myths with another.

For centuries the ruling idea was that humans must dominate nature, but there have always been those who disagreed. Science has made such dissent more popular, and today we are much less fearful of nature and not as subject to its harsher realities, which were pervasive even a century ago (Dunlap 1988).

Wildlife policy in America has evolved from a hands-off approach, to recognition of dwindling resources, to management of individual species and populations (Cubbage et al. 1993). Until recently, wildlife policy was aimed almost exclusively at the conservation of fish and game that could be taken in sporting activities. It is now moving in the direction of ecosystem-based management. Other aspects of wildlife, including ecology, esthetics, and ethics, are becoming more important in our society. As embodied in the ESA, wildlife protection policy for these values and purposes has become perhaps the most controversial resource management policy of the 1990s. A complex web of federal and state laws helps protect wildlife from ever-increasing human population pressures. The laws, particularly the ESA, often are the center of debate about the values of wildlife versus the values of developed human uses. The debate provides the basis for evolving public policy (Cubbage et al. 1993).

Science is only one of many factors considered by policy-makers. Dunlap (1988) said that science is supposed to guide wildlife policy. He observed the reality is that policy-making involves choices and values more than decisions of fact, and that scientific findings can be interpreted in different ways. Nonetheless, scientific knowledge has been instrumental in policy shifts over the last century and scientists have played important roles in the public debate concerning humans and nature by fostering public appreciation for wildlife (Dunlap 1988).

Two ideas about science are presented in this **Introduction**. The first concerns science as objective knowledge, which can be a problem because science is influenced by values. The second is science as information in the public policy process, and follows from the first. Because the ESA gives biological science primacy over other considerations, problems arise as societal goals other than



species conservation are considered in public policy forums.

*Science as Objective Knowledge.* In *A Sand County Almanac*, Aldo Leopold (1949) described how science and its objective viewpoint has served society:

Science contributes moral as well as material blessings to the world. It's great moral contribution is objectivity, or the scientific point of view. This means doubting everything except facts; it means hewing to the facts; letting the chips fall where they may. One of the facts hewn to by science is that every river needs more people, and all people need more inventions, and hence more science; the good life depends on the indefinite extension of this chain of logic. (Leopold 1949, p. 163).

Then in the "Land Ethic" Leopold (1949) illustrated how science can be abused when scientific objectivity is foregone:

In all of these [land as soil *versus* land as biota] cleavages, we see repeated the same basic paradoxes: man the conqueror *versus* man the biotic citizen; science the sharpener of his sword *versus* science the searchlight on his universe; land the slave and servant *versus* land the collective organism. (Leopold 1949, p. 260, italics are Leopold's).

Journalists have an influence on public policy through public opinion, and their observations are an appropriate part of this policy analysis. In his book *The Final Forest*, Dietrich (1992), chief science correspondent for the *Seattle Times*, directed his Pulitzer Prize-winning talents to scientific problems associated with conservation of the northern spotted owl in the Pacific Northwest:

What such confrontations [between scientists] illustrated is how important the assumptions and motives of individual scientists had become. In an age of uncertainty and moral confusion, we tend to enshrine science for the truth it seems to offer. And in fact, over time science does tend to be ruthlessly objective, with even the most sacred theories fair game for scrutiny and challenge. But the stereotype of the scientist as objective to the point of being emotionless and socially naive is rarely accurate. Scientists' background colors their observations, which in turn drives their research. Nor do they live in a social vacuum. (Dietrich 1992, p. 73).

Because a scientist knows more than anyone else about a particular facet of a particular issue, it is difficult for anyone but a disciplinary peer to know if a scientist is searching objectively for knowledge. However, if a scientist falsifies data, misrepresents facts, and does not clearly distinguish theories, hypotheses, and opinions from the results of scientific inquiry, then his or her scientific objectivity is placed in doubt.

If the scientific method is followed, science can indeed shed light on many problems, but not all of them in the case of ESA species conservation. Roger (1995), the Fisheries Science Department Manager for the Columbia River Inter-Tribal Fish Commission, described what science can contribute to salmon conservation efforts in the Pacific Northwest:

The central role of science in the current Columbia Basin salmon crisis is to clearly describe to decision-makers and the public the present condition of salmon populations, the major reasons for recent declining trends in abundance, and the most likely results of various restoration strategies. Properly describing the problem and hypothesizing the results of corrective actions are the first two steps of the scientific method.

The next steps are to implement restoration actions, compare the actual and predicted results of those actions, and refine and modify future actions. These five steps constitute the heart of scientific methodology. When actions are directed toward achieving a clearly stated goal—such goals are usually developed through political processes—these steps are also the core of what is called adaptive management. (Roger, 1995, p. 22).

Science has something to say about what might happen if various recovery actions are implemented. But the goal for such actions is developed by political processes, not by scientists. The "clearly stated goal" Roger (1995) mentioned is not yet clear in the case of salmon conservation under the ESA, but perhaps will be soon if the recovery plan proposed by the NMFS (1995b) is adopted.

Roger (1995) made two additional points regarding scientific objectivity. First, he said the technical and policy functions should be kept separate if science is to be used effectively. The policy task is to choose among alternative management options based

on information provided by scientists. The second point is that when scientists are faced with incomplete information, as is often the case in species conservation, to achieve technical consensus it is necessary to use an impartial dispute resolution mechanism. For example, the complexity of salmon conservation and incompleteness of information means that a single "best" interpretation of data is not possible, and a skilled third party that all sides respect can be a catalyst for progress (Roger 1995).

**Science and Policy.** The ESA is but one example of what seems to be an increasingly important role of science in public policy decisions. The ESA was designed to favor biological science over other scientific disciplines and viewpoints. Some of the calls for ESA reform are premised on the belief that other viewpoints besides biological science should be considered in species conservation decisions.

The ESA evokes emotional responses from people, including not only interest group representatives and people whose livelihoods are affected by land and resource management decisions, but also scientists and public agency professionals. By requiring procedures and substantive actions to ensure that human actions take into account how they will affect imperiled plants and animals, the ESA defines a relationship of humans to the natural world. As Rohlf (1991) described it, the resulting public policy is an imperfect blending of science with law. Actions firmly grounded in biological science are necessary for answering the difficult land-use questions facing us today. Biological data are frequently missing that would be useful for making some of the judgments required under the law.

What if biological knowledge comes up short of answering questions about how many members of a species make a viable population and what kind of habitat is essential for their existence? Scientists nonetheless can provide their expert opinions, as the ecologist Botkin and his colleagues (1995) argued. They suggested that these opinions, expert though they may be, should be carefully identified as something other than the results of scientific

inquiry—an "expert witness" approach was recommended (see Sidebar I-1).

Uncertainty about the future consequences of current actions will always exist. This leads to controversial issues about who makes the decisions and on what basis, as well as where, how, and why ESA policy tools are deployed. At issue is whether biology should be the only scientific input to land and resource management decisions. A wildlife biologist (Schaller, 1992, p. 47) noted that "conservation problems are social and economic, not scientific, yet biologists have traditionally been asked to solve them." A resource sociologist (Machlis, 1992, p. 161) observed that "biologists, ecologists, and conservationists have increasingly grasped a harsh reality: solutions to biological problems lie in social, cultural, and economic systems." Case studies of many endangered species recovery programs (see Clark et al. 1994) provide ample testimony in support of the importance of non-biological factors in species conservation (Wondollock et al. 1994).

Scientists should be aware of the expectations others place on them, and when talking about science should be careful to stay within the boundaries of their disciplinary training and collected data. They should clearly distinguish between facts, theories, hypotheses, and opinions. If differences in opinions about the interpretation of data exist, they should clearly be stated as such, or scientific credibility can be diminished. When one scientist loses credibility, the rest suffer. No ESA issue is more scientifically or politically difficult than salmon recovery. Because of the failure of other public policies to protect salmon, the ESA has biologists from the NMFS making decisions about hydropower dam and reservoir operations, grazing, and timber harvests. The salmon case study presented herein (see **Appendix B**) may lead one to ask if the ESA is an effective approach to attempt to recover dwindling salmon populations.

A National Research Council committee (NRC 1995) was assembled at the request of some members of Congress to analyze and report on science issues in the design and implementation of the ESA. The committee's

### Sidebar I-1. Insufficient Data and the Expert Witness Approach

When faced with the absence of sufficient cause-and-effect explanations and with insufficient data and statistical analyses, scientists often respond to questions ... by giving personal opinions based on their experience as naturalists and working scientists. They respond as would an expert witness testifying on a case which has inadequate scientific information and analyses, but about which he has had more experience than the average person. Sometimes there is no other choice with major practical questions. The advice given by a scientist acting as an expert witness may be legitimate as long as both the scientists and the audience understand that such statements are opinion based on experience. Too often, because science tends to be highly respected in our society, the distinction is not made between a scientist's expert opinion and a scientist's report on the results of scientific cause-and-effect studies or the results of valid statistical analysis. As a result, opinion is accepted as scientific conclusion.... The expert witness approach is useful when it is acknowledged as such, but would be counterproductive if mistaken to represent the results of specific scientific research and experiments.

Source: Botkin et al. (1995).

Science and the Endangered Species Act report (see Murphy 1995, Eisner et al. 1995) promises to set part of the public policy agenda for ESA amendment, but only part of it, as the committee's charge was limited to analysis of biological science issues. The report said,

[S]ound science alone will not lead to successful prevention of many species extinctions, conservation of biological diversity, and reduced economic and social uncertainty and disruption. But sound science is an essential starting point. Combined with innovative and workable policies, it can help solve these and related problems. (NRC 1995, p. 12).

Species require adequate habitat, and habitat deprivation is the leading cause of species endangerment. The goal of the ESA is recovery of species facing endangerment. Recovery often involves the modification of land-use practices. Habitat management is a land-use problem, and as such is inherently political as well as biological. The crux of the ESA species conservation problem is modifying human behavior to accommodate other species.

Policy analysts Brewer and Clark (1994, p. 391) observed that "regardless of what the formal ESA policy may call for, the real ESA policy is made in the implementation process." This report analyzes several cases of how ESA implementation has proceeded in Idaho, and presents a mixture of facts, hypotheses, and values from different

viewpoints. Values and other non-biological factors are an important part of the ESA debate. Journalistic sources—a blending of fact and perception—are used in this report to document ESA implementation cases. These sources are significant because of their influence on public opinion, which in turn influences public policy.

The ESA is about the relationship of humans and non-humans. Evolutionary biologist and Pulitzer Prize winner E.O. Wilson (1988) addressed this relationship and emphasized the importance of ethics as he recognized the limits of science, and the necessity of reconciling the same paradox Aldo Leopold referred to in the "Land Ethic":

In the end, I suspect it will all come down to a decision of ethics—how we value the natural worlds in which we evolved and now, increasingly, how we regard our status as individuals. We are fundamentally mammals and free spirits who reached this high a level of rationality by the perpetual creation of new options. Natural philosophy and science have brought into clear relief what might be the essential paradox of human existence. The drive toward perpetual expansion—or personal freedom—is basic to the human spirit. But to sustain it we need the most delicate, knowing stewardship of the living world that can be devised. Expansion and stewardship may appear at first to be conflicting goals, but the opposite is true. The depth of the conservation ethic will be measured by the extent to which each of the two

approaches to nature is used to reshape and reinforce the other. (Wilson 1988, p. 16).

Wilson's sentiments are also reflected in the very first words of the ESA:

The Congress finds and declares that various species of fish, wildlife and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation. (ESA § 2(a)(1)).

After 22 years, we are beginning to see how difficult it is to balance development and conservation. The ESA has tried to temper economic development by giving species conservation the upper hand. As the analysis herein documents, Wilson's "essential paradox of human existence" is a feature of species conservation, which is sometimes done without significant consideration of its effect on the human desire for economic expansion, or on

personal freedom.

In this report ESA processes are analyzed and illustrated with Idaho case studies of how the Act plays out in real situations. The ESA can work for all species, human and non-human. There is widespread support for the basic goal of species conservation, and the courts have consistently upheld the Act. This leads to the conclusion that the ESA is not going to go away. This report identifies scientific and institutional challenges stemming from policy issues associated with the ESA that should be carefully considered in attempts to redesign the Act. This report looks at the confrontation and rigidity that have characterized some of the on-the-ground ESA issues with an eye toward promoting a spirit of cooperation that will make the ESA more effective in achieving its goals.

**Question 1. How does the ESA work?**

People have different points-of-view on the ESA. To understand these different perspectives, one first must understand the law. How does the ESA work? The question is answered here by describing the mechanisms of the Act. Descriptions of federal and state agency roles and the relationship between them are covered in Question 2. The evaluative interpretation of the ESA is addressed by later questions, where analysis focuses on ESA issues (Questions 9, 10, and 11), flexibility in the ESA (Question 12), a potential role for economic analysis in the ESA (Question 13), and alternatives for modifying the ESA (Question 15).

The ESA has special terminology. Some of these words are defined in the ESA. Because it is a law, these words have legal meanings. For example, conservation has a legal definition quite apart from its use elsewhere. A few of these key statutory definitions were provided in Sidebar S-1 (page 4), and these terms are underlined throughout this report. Other important terms are defined not in the ESA statute, but in the implementing regulations of the Service. For example, "jeopardy" and "harm" are extremely important ESA terms defined by regulation, and they will be placed in quotation marks throughout the report.

It is not difficult to understand how the ESA is designed to work. The Act mandates four things: [1] listing, which means **identify** formally those species endangered or threatened with extinction; [2] **identify** and designate critical habitat considered essential for such species to continue to exist and to attain recovery; [3] **protect** the species while actions are being taken to improve the situation causing its endangerment; and [4] **recover** the species so that it is no longer necessary to **protect** the species and it can be taken off the protected species list, or delisted. If you can remember the words **identify**, **protect**, and **recover**, you understand how the ESA works.

**Overview of the ESA**

This section begins with a simplified overview of the whys and wherefores of the Act,

followed by a brief explanation of the purpose and scope of the ESA, and condensed explanations of the processes required by the law.

**A Simplified Overview.** Sidebar S-2 (page 5) explained the purpose and mechanisms of the ESA as simply as possible. The Act is simple in conception, but difficult in application.

**Purpose and Scope.** The purpose and scope of the ESA can be described with two words—species conservation. These terms have very specific definitions in the ESA. Taken together, the words species conservation describe the purpose of the Act. Taken individually as defined in the Act, the two words describe the scope of the ESA:

Species includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature. (ESA § 3(16)).

Conservation means the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which [such] measures are no longer necessary. (ESA § 3(3)).

The Act defines species expansively, including subspecies (e.g., the northern spotted owl) and distinct population segments of species (e.g., the fall run of Snake River chinook salmon is considered a different species than the spring and summer runs of Snake River chinook salmon). The reasons for this expansive definition are primarily to protect evolutionary potential to reduce extinction risk (see Question 9). Conservation translates into recovery activity, because "the point at which [such] measures are no longer necessary" (ESA § 3(3)) is when recovery goals have been attained.

The purpose of the Act, then, is to **identify**, **protect**, and **recover** plants and animals threatened or endangered with extinction. The scope of the Act is found in the definition of species, and also in the definitions of threatened and endangered, both of which apply to species "throughout all or a significant portion of its range" (ESA §§ 3(6), (20)).

**ESA Processes.** The mandate of the ESA—**identify, protect, and recover**—suggests this process: a species is listed as threatened or endangered in a particular location because it is at low abundance caused by specific problems, the species is protected while the Service prepares a recovery plan specifying how the problems endangering the species will be corrected, the plan is implemented, the species recovers to the point that special federal protection is no longer needed, and the species is delisted. The key to the process is the accurate identification of the problems endangering the species, accompanied by the development of management programs designed to correct the problems, and monitoring the response of the species to those programs. Because many animal species are typically difficult to census and study, the three key tasks—identification of problems, their correction, and monitoring the species—can be very difficult in practice. These tasks are further complicated because populations are at low levels when the species is listed under the ESA.

The ultimate goal of the ESA is species conservation. One way to describe how the Act does that is to use the three short paragraphs in which the U.S. Fish and Wildlife Service describes the conservation actions provided by the ESA (see Sidebar 1-1).

The remainder of this section provides a brief overview of the process generated by the ESA mandates—identify, protect, and recover. The rest of the chapter provides the details on the implementation of the ESA statute through agency regulations as well as relevant case law.

**Identify and List Species.**—Listing is the formal identification of endangered and threatened species through rule-making procedures. In 1982, the U.S. Congress said listing decisions are to be based only on biology. The reasons for listing a species are the factors causing endangerment. They are given in the Act (ESA § 4(a)(1)) and are to be identified by the Service. Economic and other non-biological considerations are to have no role in listing.

The law provides for an expansive definition of species—that is, the ESA definition of species includes subspecies and population

segments—in order to protect genetic diversity and evolutionary potential. In March 1995, there were 961 species listed as threatened or endangered in the United States (US-FWS 1995b). Listed species represent major taxonomic classifications as follows: mammals and birds (16%); reptiles and amphibians (5%); fishes (11%); insects, spiders, crustaceans, snails and clams (14%); and plants (54%). Most listings in recent years have been plants, snails and clams, and fish (Figure S-2, see page 3). In excess of 3,700 more species (mostly plants) may qualify for listing.

**Identify and Designate Critical Habitat.**—The designation of critical habitat for listed species recognizes the importance of protecting against habitat impoverishment. This is perhaps the most controversial feature of the Act, because a species is dependant on habitat for its existence or survival. Critical habitat for a species is defined as the area "essential to its conservation" (ESA § 3(5)). That is, the area necessary for recovery of the species. It can be the entire current geographic range the species occupies, or it can be a larger area. Critical habitat is generally to be identified and designated at the time of listing, "after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat" (ESA § 4(b)(2)).

The designation of critical habitat is generally required by the ESA, yet less than 15% of listed species have designated critical habitat. Why? Although the NMFS designates and protects critical habitat as required by the ESA (M. Tuttle, review comments), the FWS has interpreted critical habitat as redundant or unnecessary protection (Bean 1983, Rohlf 1989, Houck 1993). In the case of the northern spotted owl, the court disagreed and forced the FWS to designate critical habitat (*Northern Spotted Owl v. Lujan*, 758 F.Supp 621 [W.D. Wash. 1991]).

Instead of identifying and protecting critical habitat, the FWS protects habitat on federal lands using the "jeopardy" prohibition, and there and elsewhere by using the take prohibition, defined by the "harm" regulation (not by statute) to include "significant habitat modification." Although it is not unusual for

## Sidebar 1-1.

Available ESA Conservation Measures

Among the conservation benefits authorized for threatened and endangered plants and animals under the Endangered Species Act are: protection from adverse effects of Federal activities; restrictions on take and trafficking; a requirement that the FWS develop and carry out recovery plans; authorization to seek land purchases or exchanges for important habitat; and Federal aid to State and Commonwealth conservation departments with cooperative endangered species agreements. Listing also lends greater recognition to a species' precarious status, encouraging other conservation efforts by State and local agencies, independent organizations, and concerned individuals.

Section 7 of the Act directs Federal agencies to use their legal authorities to further the purposes of the Act by carrying out conservation programs for listed species. It also requires these agencies to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of any Endangered or Threatened species, or to adversely modify its designated Critical Habitat (if any). When an agency finds that one of its activities may affect a listed species, it is required to consult with the FWS to avoid jeopardy. If necessary, "reasonable and prudent alternatives," such as project modifications or rescheduling, are suggested to allow completion of the proposed activity. Where a Federal action may jeopardize the survival of a species that is proposed for listing, the Federal agency is required to "confer" with the FWS (although the results of such a conference are not legally binding).

Additional protection is authorized by section 9 of the Act, which makes it illegal to take, import, export, or engage in interstate or international commerce in listed animals except by permit for certain conservation purposes. The Act also makes it illegal to possess, sell, or transport any listed species taken in violation of the law. For plants, trade restrictions are the same but the rules on "take" are different. It is unlawful to collect or maliciously damage any Endangered plant on lands under Federal jurisdiction. Removing or damaging listed plants on State and private lands in knowing violation of State law, or in the course of violating a State criminal trespass law, also is illegal under the Act. In addition, some States have more restrictive laws specifically against the take of State or federally listed plants and animals.

Source: *Endangered Species Technical Bulletin*, any issue.

agencies to write implementing regulations for environmental regulatory programs (M. Feldman, review comments), by not identifying habitat areas essential for species conservation, the FWS makes its own tasks easier while increasing the uncertainty for land and resource managers about where management activities may take place.

***Protect Against "Jeopardy" and "Harm".***—It is necessary to afford some degree of protection to listed species and the critical habitat upon which their continued existence depends. These are intermediate measures designed to keep imperiled species from moving any closer to extinction while a recovery plan is developed and implemented. No one is allowed to take a member of an endangered animal species except under extraordinary circumstances. Take is defined

as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (ESA § 3(18)). Endangered plants receive less protection. Damage to plants on federal lands violates the ESA if it is done maliciously and knowingly, but on state and private lands, the ESA defers to state law. Idaho does not provide statutory protection for endangered plants. Threatened species can be afforded less protection than endangered species (ESA § 4(b), see Question 12).

To protect the species and its critical habitat, federal agencies are prohibited from causing "jeopardy" to the species, or allowing adverse modification of critical habitat (ESA § 7(a)(2)). Neither "jeopardy" nor "adverse modification" are defined in the Act. These determinations are made through the process

of interagency consultation, through which the Service provides its expertise regarding the potential impacts of planned land and resource management activities as they might impact protected species.

"Harm," in the statutory definition of take, is defined in ESA implementation regulations.

[Harm is] an act which actually kills or injures wildlife [and which] may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. (50 CFR § 17.3 [1992]).

Protection goes wherever the species goes, and frequently to the habitat it might wander onto. According to Houck (1993), the FWS can and does use the "no jeopardy" standard to protect habitat, thus giving the agency more flexibility than a critical habitat designation would. Data is often not available that would be required to designate critical habitat, so this flexibility is a practical necessity to provide habitat protection. The take prohibition and the "harm" regulation of "significant habitat modification" as a take, regardless of whether or not it is critical habitat and regardless of whether it is federal, state, or private land, was upheld by the United State Supreme Court in June 1995 (*Babbitt v. Sweet Home Chapter*, 115 S.Ct. 2407 [1995]).

**Recover and Delist.**—The ESA requires the Service to develop a plan describing actions necessary to recover the listed species to the point where the protection of the Act is no longer necessary and it can be taken off the protected list, or delisted. This affirmative conservation duty makes the ultimate purpose of the Act the recovery of threatened and endangered species. The conservation duty is to be met through the development and implementation of a recovery plan.

The key to ESA success is recovery efforts. The recovery plan must identify "objective, measurable criteria," which by regulation translates into a quantitative recovery goal by setting a target population level. At least as important, the plan must identify any and all actions necessary to reach the recovery goal, including how to mitigate underlying problems that led to listing. The removal or mitigation of the factors causing endangerment may be

especially important for species that are hard to count, such as grizzly bears. Once the recovery goal is reached, the process of delisting begins, which is essentially the listing process in reverse.

Recovery planning seems to receive less attention than listing and protection. This is perhaps because it is a labor intensive and therefore expensive undertaking for an agency without adequate resources (D. Goble, review comments). Only half of the listed species have the required recovery plans. The biological underpinnings of these plans are uncertain (see discussion of viable populations in **Appendix A**), as is their legal status as binding documents.

Because the listing, protection, and recovery processes are driven by the biological needs of species, recovery discussion tends to focus on the number of individuals and genetic diversity within the populations of the species, with less attention on modifications of existing land-use practices and associated impacts. Biologists may tend to focus on the former concerns, land and resource managers on the latter. Ecologist Daniel Botkin (1990) pointed to the need for interdisciplinary collaboration in recovery planning:

[T]he condition of the habitat is more important than simple population numbers. It is better to have a good habitat sustaining a small population than a large population in poor habitat. Conservation of endangered species is, in this way, understood to depend on the idea of an ecosystem rather than on simple analyses of populations. This is a movement toward managing with complexity as a basic condition. (Botkin 1990, p. 162.)

### Brief History of the ESA

The evolution of the ESA is a fascinating chapter in American conservation history. Until now, protection efforts under the ESA have focused on the needs of individual species, and first became a matter of public policy in 1966 with the Endangered Species Preservation Act, a weak older sister to the Endangered Species Act of 1973. In spite of the controversies about exactly how the goal of the ESA is to be obtained, Kohm (1991) said there seems to be broad agreement and support for the conservation of endangered species,



because the basic framework of the Act has remained intact through seven amendments since 1973 (Kohm 1991). Sidebar 1-2 outlines how the Act has evolved.

Enactment of the ESA was the result of a broad consensus that animals and plants were becoming extinct at a rapidly increasing rate. In early 1973, representatives from more than eighty nations met in Washington, D.C., and agreed to a far-ranging Convention on International Trade in Endangered Species of Wild Fauna and Flora (now section 8 in the ESA). President Nixon urged congressional action, arguing that existing federal law was insufficient "to save vanishing species." In March 1973, the House held hearings at which wildlife managers and representatives of conservation organizations testified that the states alone could not or would not protect species faced with extinction. As the nation watched the Watergate hearings that summer, administration and congressional staff found common ground in the ESA legislation.

The dominant issue surrounding the passage of the ESA legislation was the relationship between federal and state governments. Control over wildlife had traditionally been a state prerogative and some state wildlife managers viewed the proposed federal role in protecting endangered species an unconstitutional intrusion upon "states' rights." Congress rejected this argument, seeking instead to engage the states in a cooperative structure. While unequivocally asserting federal jurisdiction over takings of species that a federal agency, through notice and comment and rule-making procedures, was to determine were facing extinction, Congress set out criteria under which the states could reassume management of resident wildlife. These important topics are covered in the last section of Question 2.

**Congressional Declarations.** The United States Congress issued the following declarations in section 2 of the ESA, which clearly state the underlying reasons for the Act. In the ESA, the Congress finds and declares that

[V]arious species of fish, wildlife, and plants in the United States have been rendered extinct as a consequence of economic growth and

development untempered by adequate concern and conservation....

[O]ther species of fish, wildlife, and plants have been so depleted in numbers that they are in danger of or threatened with extinction....

[T]hese species of fish, wildlife, and plants are of esthetics, ecological, educational, historical, recreational, and scientific value to the Nation and its people....

[E]ncouraging the States and other interested Parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs which meet national and international standards is a key to meeting the Nation's international commitments and to better safeguarding, for the benefit of all citizens, the Nation's heritage in fish, wildlife, and plants. (ESA § 2(a)).

It is further declared to be the policy of Congress that

[A]ll Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities [to do so].

Federal agencies shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species. (ESA § 2(c))

**Supreme Court Opinion.** In 1978, the Supreme Court heard its first and, for almost twenty years, only ESA case. (The second ESA case, *Babbitt v. Sweet Home Chapter*, was ruled on in June 1995.) In the mid-1970s, the snail darter was discovered in the Tellico River and listed as endangered, which could have prevented the completion of the Tellico Dam, a Tennessee Valley Authority (TVA) hydroelectric project. The Supreme Court ruled on behalf of the fish, saying

Congress intended endangered species to be afforded the highest of priorities, ... and the plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost. (*TVA v. Hill*, 437 U.S. 153, 174, 184 [1978])

**Congressional Intent.** Taken aback by the Supreme Court ruling in *TVA v. Hill*, Congress amended the ESA in 1978; the Act has been amended six more times since then, the latest in 1988. Congress added some

## Sidebar 1-2.

## History of the ESA

**1966 Endangered Species Preservation Act**

- Authorized the Secretary of the Interior to identify species of native fish and wildlife threatened with extinction and to purchase land for their protection and preservation;
- Directed all federal agencies to protect these species and preserve their habitats "insofar as is practicable and consistent with [the agencies'] primary purposes.

**1969 Endangered Species Conservation Act**

- Expanded the Department of Interior's land acquisition authority;
- Broadened the definition of fish and wildlife to include invertebrates;
- Authorized the Secretary of the Interior to list foreign species threatened with worldwide extinction and banned the importation of any species so recognized.

**1973 Endangered Species Act**

- Removed all practicability concerns (i.e., economic considerations) from decisions to protect species and their habitats;
- Extended protection to all wildlife ("any member of the animal kingdom") and to plants ("any member of the plant kingdom");
- Explicitly forbade the "taking" of an endangered organism;
- Prohibited federal agencies from authorizing, funding, or carrying out any actions that would "jeopardize" the continued existence of a listed species or result in the adverse modification of its habitat;
- Authorized the Department of the Interior to regulate threatened species (those likely to become endangered). Through regulations, in 1975, the FWS extended these species the same protection afforded endangered species.

**1978 Amendments to the ESA**

- Established the Endangered Species Committee with authority to exempt federal projects from the provisions of the ESA if the net benefits to society of an exemption clearly outweigh those of complying with the Act, and certain other criteria are met;
- Required the Secretary of the Interior to designate "to the maximum extent prudent" critical habitat for each new species listed as endangered;
- Expanded the definition of species to include subspecies, races, and distinct geographic populations.

**1982 Amendments to the ESA**

- Specifically prohibited consideration of economic impacts in the listing of a species as endangered or threatened.

**1988 Amendments to the ESA**

- Established a process for monitoring candidate and recovered species;
- Allowed the emergency listing of species in cases where such action is warranted.

Source: Lambert and Smith (1994).

flexibility into the Act, and took steps to interject some economic considerations into the Act.

Although the Service is empowered to write implementing regulations, one of the functions of courts is to determine congressional intent. The goal of the ESA statute is consistent and clear: recover threatened and endangered species.

**A Glance Back and Ahead.** The ESA does not necessarily prohibit all commercial or developmental activities in the vicinity of protected species. According to Greenwalt (1991), in most cases fears that ESA restrictions would cause major disruptions in human activity have been unfounded—wolves co-exist with dairymen in Minnesota, grizzly bears that pose a danger to humans can be

moved or destroyed, an endangered butterfly has become the pride of residents of a housing project that would have eliminated it without innovative changes by the developer. But in others, notably the spotted owl case and salmon recovery in Idaho (see **Appendix B**), disruptions have occurred. The deliberations about spotted owls and salmon in the Pacific Northwest have broken ground for a broader ecosystem approach for dealing with protection of biological diversity and endangered species. The ecosystem approach is consistent with the purpose of the ESA, however, the Act does not provide a specific program for ecosystem conservation (Feldman and Brennan 1995).

### Purpose and Scope of the ESA

The ESA is at the cutting edge of not only wildlife law, but, as Coggins and Glicksman (1995) pointed out, also public natural resources law in general. The presence of a threatened or endangered species on federal lands drastically affects management. Protection provisions in the ESA have provided courts with grounds to enjoin proposed dams, roads, hunting regulations, and timber harvesting plans (Coggins 1991, Coggins and Glicksman 1995). The Endangered Species Act has been described as the strongest and most far-reaching piece of environmental legislation enacted by any government (Kohm 1991). Controversies involving the spotted owl in the Pacific Northwest and the red-cockaded woodpecker in the South challenge traditional timber management practices and timber sales in the national forests. Salmon recovery affects the Pacific Northwest in different and even more pervasive ways than the spotted owl. Scott (review comments) said this suggests we are approaching the limits of our natural resources and impairing ecosystem health.

Alaska has bountiful runs of chinook and sockeye salmon, and abundant gray wolves, grizzly bears, and bald eagles. These species are not in imminent danger of extinction in the far north. The Act tries to protect these species from extinction elsewhere. Why? The biological rationale is that biological diversity needs protection in order to decrease the risk of extinction, and that means genetic diversity

must be protected. In his essay "Wilderness," Aldo Leopold (1949) articulated another reason: "Relegating grizzlies to Alaska is about like relegating happiness to heaven; one may never get there" (Leopold 1949, p. 277).

As Rohlf (1989) said, "disputes usually arise not over *whether* to conserve species, but over the question of to what *degree* species preservation should be enforced." At the core of ESA conflicts are questions concerning value judgments about not only the means, but also the ends of protecting biodiversity. What are the ends? There can be little doubt that at face value the purpose of the ESA is a compelling statement of national policy:

The Congress finds and declares that the United States has pledged itself as a sovereign state in the international community to conserve to the extent practicable the various species of fish or wildlife or plants facing extinction. (ESA § 2(a)(4)).

The purposes ... are to provide a means whereby the ecosystems upon which endangered species ... depend may be conserved, to provide a program for the conservation of such endangered species. (ESA § 2(b)).

The declared purpose of conserving ecosystems is not provided for in the statutory mandates of the Act. The prohibition against adverse modification of critical habitat is narrower than ecosystem protection. Furthermore, the ESA definition of conserve—"methods and procedures which are necessary to bring any endangered species or threatened species to the point at which such measures are no longer necessary"—is applied to species, not ecosystems. This leads some observers to call for modifications in the ESA, or new policies designed to protect ecosystems as well as species.

There is no confusion as to what the goal of the ESA is. A political scientist described the goal of the Act unambiguously: "All of the effort associated with the implementation of the Endangered Species Act is ultimately directed at a single goal—the recovery of endangered species to the point where their continued existence is no longer in doubt" (Tobin 1990). The objective of the FWS in implementing the ESA is also clear: "The Service's goal is to improve the status of

endangered or threatened species so that they can be delisted" (Tobin 1990).

In this report, the goal of the ESA is taken to be the recovery of listed species, and nothing more. Ecosystem protection and restoration are certainly important natural resource management goals and can be used as a means to achieve the recovery of individual species. However, ecosystem protection is not the goal of the ESA. Recovery of threatened and endangered species protected by the Act is the goal.

### What the ESA Requires

How the ESA proceeds with the business of recovering threatened and endangered species is vague, thus providing the Service with ample opportunity to affect land-use decisions where agency personnel feel it is necessary.

The ESA has far-reaching implications on state and private lands as well as federal, and the Act has teeth. Criminal penalties of up to \$50,000 in fines and one year in prison may be assessed, plus civil penalties of up to \$25,000 for each violation, and forfeiture and seizure of equipment (ESA § 11). Broad citizen suit provisions also are included. More far reaching than the criminal or civil penalties of the Act are its injunctive powers, which have been consistently upheld by the courts (ESA § 11(e)(6)).

The presence of a species protected by the ESA complicates the use of that area for other purposes and narrows management flexibility. Agencies must go through the section 7 consultation process with the Service, and must promote recovery of the species as well as avoid "jeopardizing" the species. No one, may take a species, unless authorized to do so by the Service. The keys to solving the ESA puzzle are to accommodate the needs of protected species and mitigate the factors causing endangerment (Coggins and Glicksman 1995).

As a nation we are committed to protecting from extinction what remains of our plant and animal heritage. But in practice, we also seem to be trying to protect the evolutionary potential of species as well as protecting current species from becoming extinct. Biologists have effectively argued that to

protect a species, its genetic diversity must be preserved. This is accomplished by protecting distinct population segments and subspecies. The ESA language says that is the way it shall be. It also says ecosystems are to be conserved, which many people interpret as full and complete protection of all habitat the species uses, even though the ESA clearly limits such protection to only critical habitat features essential to recover the species. In effect, the ESA commits us to protect aspects of the natural environment that could be transformed by human activity.

### Identifying Imperiled Species

The ESA requires that species be identified and formally listed before they can be protected by the Act, although a modicum of protection is provided to candidate species. The identification process is universally referred to as "listing."

**Listing Process.** The ESA process begins with listing, the identification of imperiled species to put on the threatened and endangered species list. As of March 1, 1995, there were 436 U.S. animal species, 525 U.S. plant species, and 565 foreign species on the list. Listing is important because it triggers the four major duties of the ESA, which are to conserve listed species, avoid "jeopardization," avoid adverse modification of critical habitat, and avoid taking (Coggins 1991, Coggins and Glicksman 1995). These key terms are defined in the **Glossary**, and their implications are analyzed in this chapter and throughout the report.

The first of the four provisions—conservation of listed species—requires action by federal agencies. Conservation is defined as "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures... are no longer necessary" (ESA § 3(3)).

The listing process may be initiated either by the implementing federal Service agencies or by petition from any interested party. Once the process is begun, the Service must review the status of the species, using the best available scientific or commercial data.

Two federal agencies and their cabinet officers have the authority to list species: the U.S. Fish and Wildlife Service (FWS) under the Secretary of the Interior, and, in the case of salmon, other anadromous fish, and most marine species, the National Marine Fisheries Service (NMFS) under the Secretary of Commerce. The Secretary is to make listing determinations "...solely on the basis of the best scientific and commercial data available to him after conducting a review of the status of the species and after taking into account those efforts, if any, being made by any State or foreign nation ... to protect such species" (ESA § 4(b)(1)(A)).

The ESA specifies a four-step process for listing a species (Figure 1-1). First is the receipt and evaluation of a petition to list, delist, or reclassify a species. Within 90 days of receipt of the petition, the FWS is required to make a finding on whether it presents "substantial scientific or commercial information" indicating that the action "may be warranted" (ESA § 4(b)(3)(A)). A status review is the second step of the listing process. This is an evaluation of the best available data and biological information to determine whether a species is endangered—i.e., "in danger of extinction throughout all or a significant portion of its range" (ESA § 3(6))—or threatened—i.e., "likely to become endangered within the foreseeable future throughout all or a significant portion of its range" (ESA § 3(20)). The status review includes a determination of which of the five factors causing endangerment may be relevant. (These two steps and related considerations in the listing process are further explained in the following sub-sections). The third step is publication of the findings in the *Federal Register* as a proposed rule. The public has an opportunity to comment on these proposals (ESA § 4(b)(5)(A)-(E)). The fourth and final step in the listing process is publication of a final rule in the *Federal Register* (Figure 1-1).

Listing can be initiated by the Service through the normal rule-making procedures or by emergency listing through issuance of regulations. Emergency listings expire within 240 days unless normal listing procedures are initiated during that period.

**Citizen Petitions and Lawsuits.**—By far the

most common method for initiating listing is by petition from interested parties (Hill 1992). Coggins and Russell (1982) noted that several organizations "have taken advantage" of this opportunity. The process from petition to listing can take as long as 2½ years (see Tobin 1990).

Within 12 months after receiving the petition for a listing, the Service must publish a notice in the *Federal Register* that the petition to list is warranted, not warranted, or "warranted but precluded" by other ESA-related activities (Figure 1-2). If the Service does not find substantial information that listing is warranted at its 90-day determination, or that the 12-month ruling is not warranted or "warranted but precluded," the findings are subject to judicial review (Hill 1992).

A private citizen or group can force the FWS to list a species, as happened in the northern spotted owl case. Coggins and Glicksman (1995) cited several cases where persons seeking judicial remedy to prevent or reverse the listing of a species have been unsuccessful, and stated that such attempts will generally not be successful. An exception occurred in Idaho when the Bruneau hot springs snail was removed from the endangered list because of procedural delays during the listing process (US-GAO 1993b). However, it was put back on the list in June 1995 because the Ninth Circuit Court of Appeals reversed the district court's ruling. In Idaho, petitions and suits initiated by citizens occur frequently enough that FWS staff are not likely to initiate new listings (C. Lobdell, pers. comm.).

**Procedures.**—Listing is a complicated process with many steps (summarized in Figures 1-1 and 1-2). The best opportunity for citizen comment is during the status review phase (ESA § 4(b)(3)(A)), which is relatively inaccessible to public input but is the "go" or "no-go" decision based on biological information on whether to list the species before regulations have been written (Brooks 1992).

**Factors Causing Endangerment.**—The Act identifies five factors that lead to species endangerment:

The Secretary shall ... determine whether any species is an endangered species or a threatened

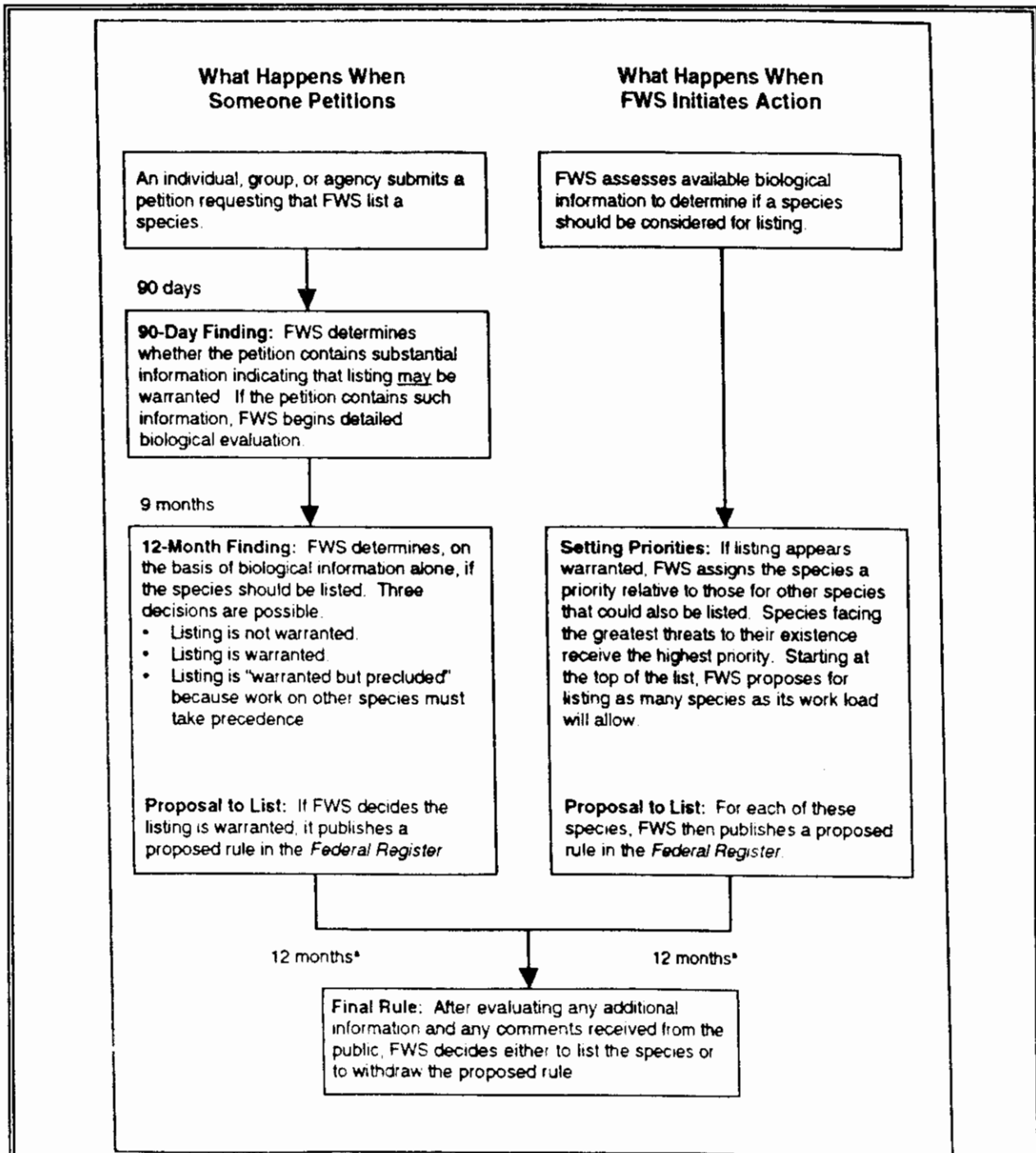
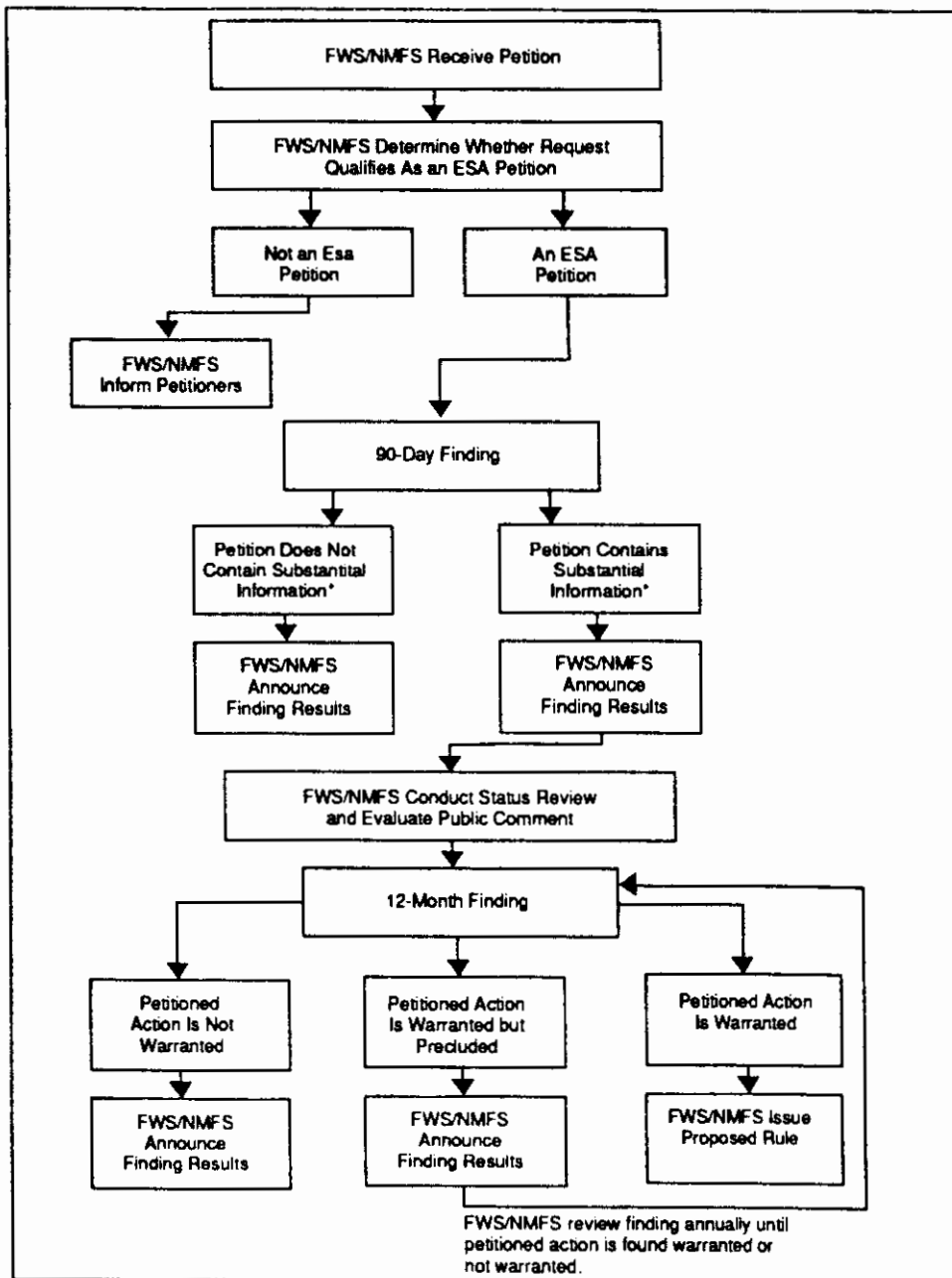


Figure 1-1. Process for considering whether a species warrants listing.

Source: US-GAO (1992, Figure 1, p. 4).



Note: "Substantial information" is defined as information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted.

Figure 1-2. ESA petition for listing process.

Source: US-GAO (1992, Figure 3.1, p. 12).

species because of any of the following factors:

- (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) overutilization for commercial, recreational, scientific, or educational purposes;
- (C) disease or predation;
- (D) the inadequacy of existing regulatory mechanisms; or
- (E) other natural or manmade factors affecting its continued existence. (ESA § 4(a)(1)).

These five factors represent the problems that must be mitigated in order to recover a listed species. Efforts to do so are to be identified in the recovery plan, along with the factors.

**Best Available Data.**—Listing decisions are based on the available evidence that a species "is in danger of extinction throughout all or a significant part of its range" or "likely to become [so]" (ESA §§ 3(6), (20)).

The basis for listing determinations hinges on the quality of available information and a status review of the species. The Secretary shall make determinations ... solely on the basis of the best scientific and commercial data available ... after conducting a review of the status of the species and after taking into account those efforts, if any, being made by any State or foreign nation ... to protect such species. (ESA § 4(b)).

According to Coggins and Glicksman (1995), Congress meant to insure that listing decisions are based solely on biological risks, thus economic considerations have no relevance and economic analysis is not to be applied in the listing process (Conf. Rep. No. 835, 97th Cong., 2d Sess. [1982]). To the extent that the biological information on a species is uncertain, a court is likely to defer to the expertise of the FWS if the agency's listing decision is challenged.

Probably the most important single determinant of species status under the ESA is its population. Some of the most fundamental pieces of information needed to assess population status and trends are fraught with uncertainty—for example, how many individual members of the population are there, and what is the direction and magnitude of population change? Listing proposals often are not accompanied by complete data on

population trends, and this can influence listing decisions. In uncertain situations, wildlife biologists tend to make decisions that do not put wildlife at further risk. Thus biological uncertainty may lead to a listing in order to provide effective protection until more population data can be gathered and analyzed. This approach is consistent with the ESA because one of the basic criteria for delisting a species is that the original listing was in error (MacCracken et al. 1994).

Legal and political risks also can complicate the listing and delisting decisions. Although the Act requires the listing decision be made "solely on the basis of the best scientific and commercial data available" (ESA § 4(b)(1) (A)), concerns about social and economic impacts can overshadow uncertain biological evidence (Thomas and Verner 1992, US-GAO 1993b). Listing petition denials or delays by the FWS have in some cases forced petitioners to seek court rulings.

**Definition of a Species.** A primary source of confusion among many people concerned with the impacts of the ESA is the apparent inconsistency of listing species as threatened or endangered in some regions of the United States, while the same species may be abundant and in some cases commercially exploited in other parts of this nation and in other countries. Both the grizzly bear, listed as threatened in 1975, and sockeye salmon, listed as endangered in Idaho and the Snake River in 1992, are good examples of this situation. Grizzly bears are abundant and legally hunted in Alaska, and cans of Alaskan sockeye salmon can be purchased at almost any grocery store.

The ESA's definitions provide two explanations for this apparent discrepancy. First, the Act protects a species that is endangered or threatened "throughout all or a significant portion of its range" (ESA §§ 3(6), (20)). The grizzly bear is listed as threatened throughout its range in the lower 48 states, which is only 5% of what its range once was (Mattson et al. 1995). The question of whether this geographical area is a significant portion of the species' range is negated by a second definition. The ESA defines species



very broadly to include not only "any subspecies" but also "any distinct population segment of any species" (ESA § 3(16)).

The definition of species in the ESA is broad and ambiguous (Rohlf 1989) because the scientific determination of subspecies is ambiguous (Wilson 1992). "The term 'species' includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature" (ESA § 3(16)). Under this definition, the Act's protections apply to any subspecies or distinct population segment that is threatened or endangered, regardless of the status of other subspecies or populations. According to a panel commissioned by the National Academy of Sciences, this is necessary to protect evolutionary potential (NRC 1995).

The species definitions in the ESA are somewhat hierarchical, with a species being the broadest and most encompassing, followed by subspecies, and then a distinct population segment. All three levels are treated the same under the ESA because each is defined as a species (ESA § 3(16)). For example, Idaho populations of grizzly bear and sockeye salmon are geographically and reproductively separated from other populations; therefore, they are treated as a different species from those in Alaska because they are distinct population segments. Although neither the ESA nor the regulations implementing the Act define the term "distinct population segment," the clear meaning of the term—a population that is separated from other populations of the species—has apparently been adopted by the FWS. This designation is independent of whether or not a population is a subspecies. The key requirement is lack of interbreeding with other populations.

ESA regulations define the term "population" as "a group of fish or wildlife in the same taxon below the sub-specific level, in a common spatial arrangement that interbreed when mature" (50 CFR § 17.3 [1993]). If a population is a "distinct population segment"—and if that population satisfies the biological criteria as either threatened or endangered (ESA §§ 3(6), (20))—then the FWS will either list that population of the species as either threatened or endangered, or

in some cases place it in the "warranted but precluded" candidate category (see Question 7).

The NMFS takes a different approach to identifying distinct population segments of fish than the FWS does, calling them "evolutionarily significant units." The NMFS definition considers two criteria for defining a population as an ESU: (1) it must be reproductively isolated from other conspecific population units, and (2) it must represent an important component in the evolutionary legacy of the species. The second criteria would be met if the population "contributed substantially" to the ecological or genetic diversity of the species as a whole (Waples 1991).

***Difference Between Threatened and Endangered Status.*** Species may be listed as endangered or threatened or both, as six species are (US-FWS 1995b). The difference between threatened and endangered species is subtle, but important. The most significant difference between the threatened and endangered designations is the degree of statutory protection accorded the species. The Act itself imposes stringent limitations on the taking of endangered species (ESA § 9(a)(1)). In section 4(d), the ESA allows, but does not require, the Secretary to adopt regulations protecting threatened species:

Whenever any species is listed as a threatened species ... the Secretary shall issue regulations as he deems necessary and advisable to provide for the conservation of such species. The Secretary may by regulation prohibit with respect to any threatened species any Act [generally "taking"] prohibited under section 9(a)(1), in the case of fish and wildlife, or section 9(a)(2), in the case of plants with respect to endangered species; except that with respect to the taking of resident species of fish or wildlife, such regulations shall apply in any State which has entered into a cooperative agreement pursuant to section 6(c) of this Act only to the extent that such regulations have also been adopted by the State. (ESA § 4(d)).

Although this accords the Secretary the opportunity to allow takings of threatened species, that alternative is limited by the requirement that the taking be for the

conservation of the species (*Sierra Club v. Clark*, 755 F.2d 608 [8th Cir. 1985]). Further discussion of the flexibility inherent in section 4(d) is analyzed in Question 12.

**Delisting.** A species can be delisted for any of the following reasons: 1) the species has gone extinct, 2) the species has recovered, and 3) the data on which the species was originally designated as threatened or endangered was in error (50 CFR § 424.11(d)(1)-(3) [1992]). If a species has been proposed for delisting because it has recovered, its status is to be evaluated in relation to the five factors considered in the listing process: (A) the present or threatened destruction, modification, or curtailment of a species habitat or range, (B) overuse for commercial, recreational, scientific, or educational purposes, (C) disease or predation, (D) the inadequacy of existing regulatory mechanisms, or (E) other natural or manmade factors effecting the species' continued existence (ESA § 4(a)(1)). If the best scientific and commercial data available substantiates the conclusion that the species is no longer endangered or threatened relative to the above factors, it is to be delisted.

The FWS takes the stance that because the ESA specifies that only those five factors can be considered in the listing or delisting process, these decisions are not subject to the requirements of the National Environmental Policy Act (NEPA). This position has been affirmed by the judiciary (*Pacific Legal Foundation v. Andrus*, 657 F.2d 829 [6th Cir. 1981] and *Douglas County v. Babbitt*, 48 F.3d 1495, 1502-1507 [9th Cir. 1995]).

Delisting proposals can be controversial and are subject to litigation. For example, in the case of grizzly bears the FWS relies on information other than the total number of bears as criteria for assessing recovery of grizzlies. Scientists and environmentalists alike are divided on the effectiveness of this approach. Indicators of bear population status are a source of contention over the current recovery plan and are a major focus of a current law suit, and will be controversial if delisting is proposed (MacCracken et al. 1994).

The revised grizzly bear recovery plan (US-FWS 1993a) stated that grizzlies can be

delisted by ecosystem, independent of the status of grizzlies in other ecosystems, and set two overall criteria for delisting. One is the achievement of the population goals for an ecosystem. The other is the approval of an interagency conservation strategy by the Interagency Grizzly Bear Committee and participants in the strategy that will guide grizzly bear management following delisting (MacCracken et al. 1994).

The FWS has taken quite a different approach with the gray wolf recovery plan. The three designated recovery areas in Central Idaho, northwestern Montana, and Yellowstone National Park each must attain the population goal of 10 breeding pairs (approximately 100-150 wolves) before the species can be considered recovered and delisted (Wise et al. 1991). The rationale is the maintenance of genetic diversity by allowing for possible interchange between the three population segments (S. Fritts, pers. comm.).

Closely related to delisting is reclassifying or downlisting a species. Two procedures may be used to make decisions on delisting or reclassifying a species: 1) a petition calling for listing, delisting, or reclassification, (ESA, § 4(b)(3)(A)); or 2) the requirement that the Service review the status of a listed species at least every five years to determine if a change has occurred (ESA § 4(c)(2)).

A decision to delist or reclassify a species must satisfy the same procedural and substantive requirements as a decision to list. A petition to list, reclassify, or delist a species may be filed with the Secretary by any interested person. Within 90 days of receipt of a petition, the Secretary must make a finding on whether the petition presents substantial scientific or commercial information to warrant the requested action. If a petition satisfies this requirement, the FWS must promptly commence a review of the status of the species to be completed within 9 months, with a decision published in the *Federal Register* within 12 months of receipt of the petition (ESA § 4(b)(3)(A)). With the publication of the decision, a public comment period begins with a final decision to be adopted within one year of the initial publication (ESA § 4(b)(6)(A)).

The ESA requires the Secretary to conduct a status review of all listed species at least once every five years (ESA § 4(c)(2)). The review is to be based on the criteria used to make the initial decision on listing a species. The status review can play a major role in the reclassification and delisting process because it may indicate improvement or deterioration of the conditions for a listed species.

Recovery plans also play a major role when delisting or reclassification is proposed. The ESA requires that recovery plans include "objective, measurable criteria which, when met, would result in a determination ... that the species be removed from the list" (ESA § 4(f)(1)(B)(ii)). For example, the FWS (1993a, p. 17) described the procedure that will be followed in delisting grizzly bear populations. The procedure is chronological. It begins with the listing decision, followed by the development of the recovery plan, attainment of population recovery goals, approval of a conservation strategy, and then a delisting proposal and final rule.

As with listing a species under the ESA, delisting and reclassification decisions are to be based "solely upon the best scientific and commercial data available" (ESA § 4(b)(1)(A), emphasis added). In other words, the delisting decision is to be based on biological information.

### Designating Critical Habitat

The recognition of the need to maintain suitable habitat for imperiled species predates the ESA. The Public Land Law Review Commission (1970) commented to the president and Congress that "Where certain areas of public lands are the only or best habitat of species that may be threatened with extinction ... other uses of the land and resources should be forgone or restricted in the interest of protecting them." Although limited funding for habitat acquisition was made available as early as 1966, it was not until the passage of the ESA in 1973 and subsequent amendment in 1978 that protection of critical habitat became an issue with the public or land management agencies (Tobin 1990).

Agencies are required to designate critical habitat necessary for recovering the species at

the time of listing. Fish, wildlife, and plants cannot exist without appropriate habitat. Houck (1993, p. 296) said, "The single most important factor in species extinction is loss of habitat." Virtually every ESA commentator agrees, including the National Research Council (Clegg 1995):

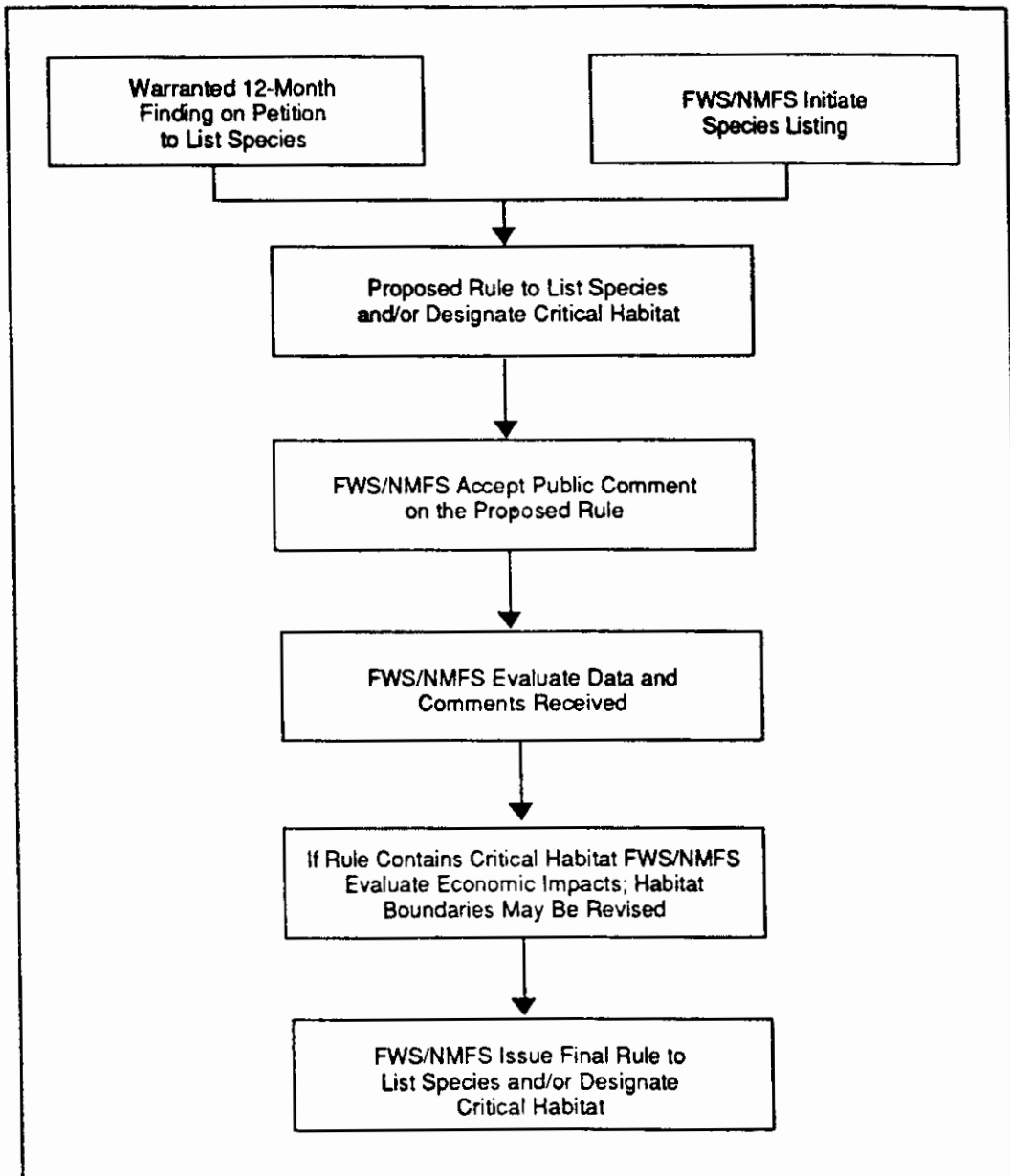
Habitat, the spatial dimension of species, is absolutely crucial to species survival. Habitat is the theater in which the network of interactions between the physical and biological worlds play out.

The ESA recognizes the importance of habitat, and provisions were included to protect habitat necessary for the continued existence and recovery of endangered or threatened species, or critical habitat.

**Definition.** The term critical habitat for a threatened or endangered species means "the specific areas within the geographical area occupied by the species, at the time it is listed... on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection" (ESA § 3(5)(A)(i)). Anything defined as essential to species conservation is therefore highly significant for successful ESA implementation. Critical habitat may also include unoccupied areas if the Service determines "that such areas are essential for the conservation of the species" (ESA § 3(5)(A)(ii)).

**Process for Designation.** As stated in the Act, "The Secretary shall designate critical habitat ... on the basis of the best scientific information available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat" (ESA § 4(b)(2)).

Critical habitat is to be designated at the time of listing (Coggins and Glicksman 1995), and follows the same rulemaking procedures (see Figure 1-3). The FWS has discretion not to designate critical habitat if imprudent or to delay the designation for up to 12 months if it is not immediately determinable. Critical habitat designation was treated as optional by the FWS between 1982 and 1991, but courts



Note: Listing usually becomes effective 30 days after final rule is issued. FWS/NMFS may take an additional 12 months, after issuance of the final rule, to designate critical habitat if insufficient data exist on which to base the designation.

Figure 1-3. ESA listing and initial critical habitat designation process.

Source: US-GAO (1992, Figure 3.2, p. 14).

have removed that option. The FWS refused to designate critical habitat for the northern spotted owl when it was listed in 1990, and the reviewing court decided the failure to designate was unsupportable and an abuse of discretion (*Northern Spotted Owl v. Lujan*, 758 F.Supp. 621 [W.D. Wash. 1991]). Soon after, another court (*Colorado Wildlife Federation v. Turner*, 23 ELR 20402 [D. Colo. 1992]) ordered the FWS to designate critical habitat for the razorback sucker, rejecting the agency's argument that a delay was justified by a lack of information (Coggins and Glicksman 1995).

According to Tobin (1990), the FWS uses five criteria for determining critical habitat: 1) Space for normal growth, movements or territorial behavior, 2) Nutritional requirements, such as food, water and minerals, 3) Sites for breeding, reproduction, or rearing of offspring, 4) Cover or shelter, and 5) Other biological, physical, or behavioral requirements.

Three questions must be answered in order to make an appropriate designation of critical habitat (Tobin 1990): First, what is the species' habitat or range? For sedentary or endemic species with very specific habitats requirements, determining their range is fairly straightforward. With wider ranging species, because of the dynamic nature of ecological processes it is difficult to identify what a species requires and where those requirements will occur over time.

Second, how large an area should be protected? The legal answer is whatever is "essential" to conservation (A. Smith, review comments). However, as Tobin (1990, p. 142) noted, as "political acceptability [of critical habitat designation] increases, risk to the species might also increase." Once a present habitat has been identified, the decision of how large an area will be protected for the species' benefit must be made, keeping in mind that delisting and recovery is the ultimate goal. One option would be to protect the species' historic range, but should a species' historic range be considered critical, even though much of it has been modified to the point that it is no longer usable by the species? A second option would be to buffer the present occupied habitat to provide room for expansion

of the population. This option is not without problems, however, as with determining a species' range, determination of how much expansion room is needed to recover the species is difficult to make with certainty.

A third option is to protect only the territory presently occupied. This, according to Tobin (1990), is the most politically astute, but the riskiest from the species' point of view. This option makes three problematic assumptions: 1) the present range is adequate for the species' survival; however, many species are threatened precisely because of inadequate habitat; 2) because recovery is the goal of ESA protection it must be assumed that present habitat can support a recovered population, however, this assumption is not valid for most endangered species (J.M. Scott, review comments); and 3) protection of current habitat may be sufficient, but only if nothing from outside the habitat, such as pesticide spraying, or water withdrawals, alters the essential features of the habitat. A hybrid option is to designate critical habitat on the basis of the some species characteristic such as prospect for recovery, potential effects of anticipated development, or perhaps economic or symbolic value.

The third question is how should habitats be protected? Chances of species recovery will be enhanced if activities that will disrupt the habitat can be prevented. The difficulty is in "determining detrimental intrusions before they occur" (Tobin 1990, p. 143).

**Significance.** In deliberations over ESA amendments in 1978, Senator Jake Garn (R-Utah) said, "The designation of critical habitat is more important than the designation of an endangered species itself." (124 Cong. Rec. 21,575 [1978]). The significance of this statement has not diminished over time, and serves well to illustrate the importance of habitat, and critical habitat is essential for species conservation.

In mid-1994, only 14% of the species listed and protected by the ESA had designated critical habitat (Table 1-1). Congress intended that virtually all of them are supposed to (Houck 1993). In a northern spotted owl ruling, a court said the agency should follow the law and designate critical habitat, which it

Table 1-1. Threatened or endangered species (by group) with designated critical habitat, August 1994.

<u>Threatened</u> or <u>Endangered</u> <u>Species</u>			
Group	USA Total	with <u>critical</u> <u>habitat</u>	% with <u>critical</u> <u>habitat</u>
Mammals	63	12	19%
Birds	87	10	11%
Reptiles	33	13	39%
Amphibians	11	3	27%
Fishes	101	47	47%
Clams	56	0	0%
Crustaceans	13	1	8%
Arachnids	4	0	0%
Insects	26	5	19%
Plants	<u>434</u>	<u>24</u>	<u>6%</u>
Total	828	115	14%

Source: *Endangered Species Technical Bulletin* (March/April 1994) and 50 CFR 17.11 & 17.12 (August 20, 1994).

has done (see Yaffee 1994, pp. 132-135). The NMFS has designated critical habitat for listed salmon, but the designations across watersheds have not been consistent. Sacramento River winter-run chinook salmon do not have the 300-foot riparian buffer zone that Snake River salmon have. Bjornn (review comments) pointed out that the inconsistency may be because the buffers are protecting different types of habitats.

Critical habitat is one of the most controversial features of the ESA. Houck (1993, p. 297) said, "The concept of providing critical habitat has turned out to be the agony of the ESA." This is unfortunate, because habitat is the essential linkage between a protected species and human activities that cause endangerment. Critical habitat identifies the essential areas where human activities affecting habitat ought to be modified so as not to adversely affect the potential to protect, recover and delist the species.

As the ESA was written and amended, habitat protection is specifically provided only under section 7 and only for critical habitat,

which applies only to lands managed or affected by federal agencies, including land managed, resources distributed, and permits issued by federal agencies. The FWS, however, protects habitat on federal lands using the no "jeopardy" standard. Houck (1993) said the agencies prefer the more discretionary flexibility of a "jeopardy" opinion to the more specific determination of "adverse modification" of critical habitat. Furthermore, by defining a section 9 taking to include habitat modification, the agency extended its regulatory powers to control land-use activities on non-federal lands. Further discussion of this issue is provided in Question 9.

### **Protecting Listed Species**

The ESA mandates two different types of protection for listed species. Section 7 prohibits federal agencies from authorizing, funding, or carrying out actions that will "jeopardize" listed species or result in "adverse modification" of their critical habitat. Section

9 prohibits any person from taking an endangered species. Taking of threatened species may be handled differently with special regulations (ESA § 4(d)), but that flexibility has seldom been used by the FWS (see Question 11).

The protection mandates are stated in terms of the entities subject to them rather than in terms of land ownership. Although section 7 applies only to actions taken by federal agencies, it significantly affects private entities that require federal authorization through permits. As a result, under some circumstances either or both of the protection mandates may apply to actions undertaken on federal, state, and private lands. For example, if an action to be undertaken on private land by a private party requires a federal permit, both section 7 and section 9 prohibitions apply. Similarly, a private person may not take an endangered species on public or private lands even if the conduct that results in the taking does not require a federal permit. The mandates of both sections 7 and 9 are applicable to federal land-use activities.

**Section 7 Duties.** Section 7 of the ESA applies to "any action authorized, funded, or carried out" by a federal agency. Thus, all private activity that requires a federal permit falls within the purview of the section 7 prohibitions. This includes not only actions such as the sale of timber from federal lands but also the issuance of Clean Water Act permits, such as wetland dredge and fill activities. Section 7 imposes two constraints on agency decisions: the agency action must not 1) be "likely to jeopardize the continued existence" of a listed species, or 2) "result in the destruction or adverse modification" of the species' critical habitat (ESA § 7(a)(2)). The FWS defines "jeopardy" as follows: "*Jeopardize the continued existence of means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, number, or distribution of that species*" (50 CFR § 402.02). As Smith (review comments) pointed out, if this regulation is applied literally, which it may not be, survival is the controlling

concept.

The application of this "no jeopardy" standard to any particular action will generally involve a unique mix of factual elements. This precludes a precise specification of the actions that might be prohibited under the ESA. For example, timber harvesting *per se* may not be a problem for grizzly bears and may actually improve habitat in some instances (Mealey 1986). However, the roads associated with harvesting timber increase human access, which can result in the killing of grizzly bears, or bear-human conflicts that result in the removal of the nuisance bear, or displacement of grizzlies from important habitat (US-FWS 1993a).

**Interagency Consultation.**—The ESA requires interagency cooperation among federal agencies, usually referred to as consultation, with the express purpose of prohibiting actions that might "jeopardize" the listed species (see Figure 1-4):

The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. All other agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act. (ESA § 7(a)).

To insure that a federal agency complies with these substantive standards, the ESA established procedures requiring the agency to consider the possible impact of its proposed action on listed species. Before entering into any contracts or making any irreversible or irretrievable commitment of resources, the agency is required to request information from the Service on whether any listed or candidate species may be present in the area (ESA § 7(c)(1)). If a species may be present, the agency is required to conduct a biological assessment to determine whether the project is "likely to affect" the species (ESA § 7(c)(1)). If the agency determines that the proposed action is "likely to affect" a listed species, it must consult with the FWS to determine whether the proposal is likely to violate the prohibitions, i.e., "jeopardize" the continued existence of the species and prospects for

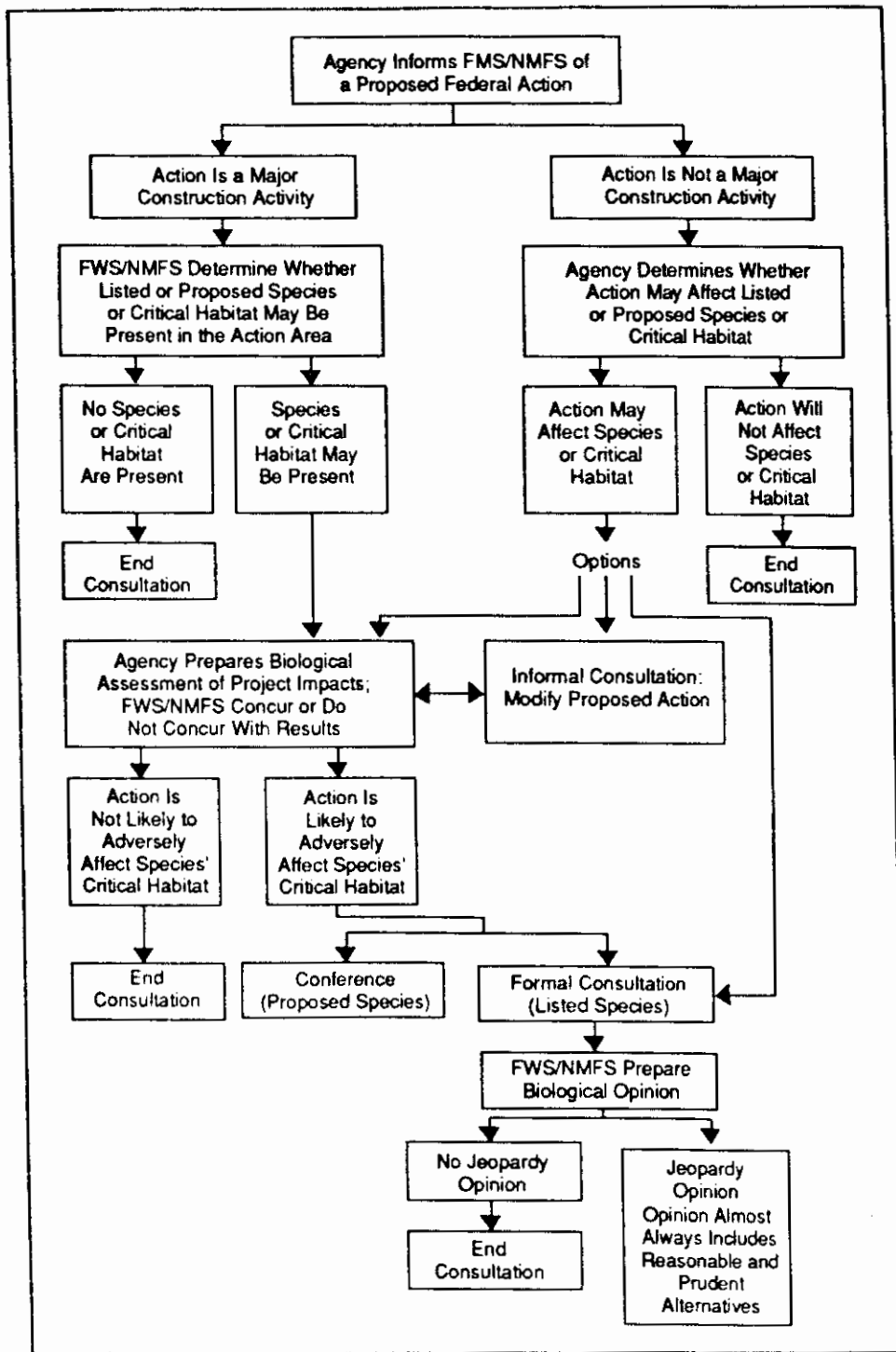


Figure 1-4. Consultation.

Source: US-GAO (1992, Figure 3.3, p. 16).



recovery, and result in the destruction or adverse modification of its critical habitat (ESA § 7(a)(2)). Smith (review comments) pointed out that through regulations for implementing consultation, agency jurisdiction is expanded, because consulting agencies are required to consult or concur on any project which "may affect" as opposed to those determined "likely to affect," which is the wording in the statute (ESA § 7 (c)). The regulatory breakdown is as follows. First there is a "no effect" or "may effect" decision. If "no effect" is the decision, then no concurrence is required from the Service. If "may effect" is the decision, then formal consultation is required unless an action is determined beneficial or "unlikely to affect" and the consulting agency concurs (A. Smith, review comments).

Consultation results in the preparation of a biological opinion by the FWS that states the likely effects of the proposed action on the species. The biological opinion comes to one of three conclusions: the proposed action 1) will not "jeopardize"; 2) will not "jeopardize" given "reasonable and prudent" alternatives, which are identified in the biological opinion; or 3) will "jeopardize."

Consultation generally results in modification of a proposed action. The ESA specifies that when the Service finds either "jeopardy" or adverse modification, the agency is to suggest "reasonable and prudent alternatives" that will avoid the "jeopardy" and adverse modification prohibitions (ESA § 7(b)(3)(A)). Thus, section 7 consultations rarely result in the termination of a proposed project. However, they can delay projects and result in mitigating actions that were not part of the original project plan.

Although the Service has no authority to prevent other agencies from taking actions that will "jeopardize" a species, an action agency generally will not proceed with the action if the Service issues a "jeopardy" opinion because the action agency is aware that it may be subject to litigation. If the action agency wishes to proceed with an action despite a Service finding of "jeopardy", it may seek an exemption for the action from the Endangered Species Committee, or "God Squad" as it has come to be known:

Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the [Endangered Species] Committee. (ESA § 7(a)(2)).

**Section 9 Duties.** Section 9 of the ESA prohibits any individual from trading in species or their parts and from engaging in an activity that would take an endangered species. This is the provision in the ESA providing substantive protection to members of a listed species and, by regulation, prohibits significant modification of habitat.

Except as provided in sections 6(g)(2) and 10 of this Act, with respect to any endangered species of fish or wildlife listed pursuant to section 4 of this Act it is unlawful for any person subject to the jurisdiction of the United States to

- (A) import any such species into, or export any such species from the United States;
- (B) take any such species within the United States or the territorial sea of the United States. (ESA § 9(a)).

It is necessary to make a distinction between an ESA section 9 take of a threatened or endangered species, and a "taking" of private property rights, which is protected by the Fifth Amendment of the United States Constitution. This issue is analyzed in Question 10.

**Animals (Take Prohibition).**—Animals are afforded more protection against taking than are plants. It is illegal for any person subject to the jurisdiction of the United States to take an endangered species within the United States, its territorial seas, or upon the high seas (ESA § 9 (a)(1)(B)-(C)). The ESA not only prohibits actions that result in the death of an identifiable member of the species, it also prohibits a wide range of non-lethal conduct because take is defined broadly as meaning to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such activity" (ESA § 3(19)).

As inclusion of the terms "harass" and "harm" demonstrate, the definition was drafted in the broadest possible manner to include every conceivable way in which a person can take or attempt to take any fish and wildlife (S.Rep. 307, 93rd Cong., 1st Sess. 7 [1973]). Indeed, the drafters intended through interpretation of the term "harass" that the definition of take is to be sufficiently broad to allow the regulation of the activities of birdwatchers where they might disturb birds and make it difficult for them to hatch or raise young (H.R. Rep. 412, 93rd Cong., 1st Sess. 11 [1973]). Thus, it is possible that a person could take a species without actually killing it. The Court did not require dead snail darters floating in the impoundment behind Tellico Dam to determine that a taking had occurred (see *TVA v. Hill*, 437 U.S. 153, 165-66, 184-85 [1978]).

**Habitat Modification as a Take.**—The ESA statute deals with habitat protection by designating critical habitat (ESA § 4), and prohibiting federal actions causing adverse modification of critical habitat (ESA § 7). The prohibition against take (ESA § 9) has been construed by the FWS to include "significant habitat modification" whether the habitat is "critical" (i.e., "essential") or not. Thus section 9 protects all habitat for listed species, regardless of whether it is essential for their survival and recovery. Thus under the ESA, one way to indirectly take a species is to modify its habitat. For example, the Hawaii Department of Land and Natural Resources, which managed a state game preserve to produce feral goats and mouflon sheep for hunting, was held to be a take of the endangered palila, a small finch, because the grazing habits of the sheep and goats prevented the regeneration of the mamane trees that were the bird's food source. In requiring the state to remove the sheep and goats, the District Court offered a discussion of "harm" as the term is defined by regulation and used in the take prohibition:

[F]inding of harm does not require death to individual members of the species; nor does it require a finding that the habitat degradation is presently driving the species toward extinction. Habitat destruction that prevents recovery of the species by effecting essential behavioral patterns causes actual injury to the species and effects a

taking under Section 9 of the Act. (*Palila v. Hawaii Dept. of Land and Nat. Res.*, 649 F. Supp. 1070, 1076 n.22 [D. Hawaii 1986], *aff'd*, 852 F.2d 1106 [9th Cir. 1988]).

A similar result was reached in a challenge to U.S. Forest Service timber harvest policies. The court concluded that the even-aged management program that the agency employed was taking the endangered red-cockaded woodpecker:

It is uncontested that a severe decline in the population of woodpeckers has occurred in the past ten years. Harm does not necessarily require proof of the death of specific or individual members of the species...but as the numbers show themselves, large percentages of the few remaining birds have died. (*Sierra Club v. Lyng*, 694 F. Supp. 1260, 1270-71 [E.D. Texas 1988]).

The crucial point is that while the death of an individual member of an endangered species is clearly a take, a take may also occur from conduct that does not actually cause an identifiable death. Activities that adversely affect normal behavioral patterns of the protected species are also prohibited. Habitat modification that precludes the recovery of the species may itself be a taking. In fact, loss or degradation of habitat may have greater negative impact on species viability than the loss of one or two animals (J.M. Scott, review comments). As early as 1981, the FWS incorporated these principles into its regulatory definition of "harm."

The Circuit Court of Appeals for the District of Columbia rejected this interpretation of harm in *Sweet Home Chapter v. Babbitt* (17 F.3d 1463 [D.C. Cir. 1994]). The court held that the agency's definition of harm as habitat modification was inconsistent with the identifying characteristic of the other terms in the statutory definition of take, which the court saw as "the perpetrator's direct application of force against the animal taken." The FWS appealed *Sweet Home* to the United States Supreme Court, which overturned the appellate court ruling and upheld the FWS definition of "harm" (see Irvin 1995).

Intertwined with the determination of what constitutes a take is the definition of "harm." In *Palila v. Hawaii Department of Land & Natural Resources* ("*Palila II*"), the district

court (affirmed by the Ninth Circuit) held that it was not necessary to document the demise of individual members of a species and that actions causing destruction or modification of habitat that prevents the recovery of the species causes "harm" to the species and is proscribed by section 9. According to Rohlf (1989), this clearly links section 9 to the expressed intent of Congress that conservation of species and the ecosystem on which they depend are primary aims of the Act. The important issues associated with the regulatory definition of "harm" as a take are covered by Question 10. Ecosystem-level protection is addressed in Question 8.

Two other issues come up in deciding what actions constitute take of a species. First is certainty. Is there a direct relation between the action and "harm" to the listed species? Second is immediacy. When, in relation to the time of the action, will a take occur? The courts have generally held that there must be a high degree of certainty—"Section 9 prohibits takings rather than actions posing risks that takings will occur" (Rohlf 1989, p. 61). The immediacy issue has not been so consistently addressed. In both *North Slope Borough v. Andrus* and *California v. Watt*, while predicating that both certainty and immediacy must be shown, the courts did not address the immediacy question in their rulings, as in neither case was certainty demonstrated. However in *Palila v. Hawaii Department of Land & Natural Resources*, the U.S. District Court ruled against the defendants argument that the challenged action—maintaining feral goat herds for hunting, which destroyed Palila habitat—was not a taking as it was not *presently* harming Palila populations. The court ruled this was "shortsighted" and enjoined the action as a taking (Rohlf 1989, p. 62). Under the *Palila* logic, for an action to be considered a take those challenging the action must show there is a certainty that the species will be "harmed" though that "harm" need not be immediate. Another recent decision (*Forest Conservation Council v. Rosboro Lumber Company*, 50 F.3d 781, 787-88 [9th Cir. 1995]) affirmed that a plaintiff must demonstrate to a "reasonable certainty" that actual "harm" to a listed species will occur from an activity in order for it to be a

prescribed taking under Section 9.

According to Smith (review comments), a take may also occur from conduct that disturbs normal behavior patterns of either an individual member or a species. Although the regulation purports to require "actual injury," the district court in *Palila II* held that any action impeding recovery met their requirement and recent actions against owners of old growth within two miles of nesting sites of spotted owls illustrates a similarly broad interpretation of actual injury (Gidari 1994).

**Plants.**—The original ESA of 1973 did not prohibit the take of listed plant species but did protect endangered plants from trade. Private collecting of endangered plants on federal lands was prohibited in 1982. Amendments to the Act in 1988 prohibit anyone from maliciously and knowingly damaging endangered plants on federal lands and removing, damaging, or destroying plants "in knowing violation" of any state law. The ESA does not address vandalism of listed plants on non-federal property, nor does it prohibit landowners from destroying endangered plants or habitat on private property. Similar actions affecting animal habitat would be illegal (Smith et al. 1993, Coggins and Harris 1987). Endangered plants may not be harmed on private lands in violation of state law, including trespass law (Rolston 1991).

Plants comprise the majority (55%) of listed species (US-FWS 1995b), and the difference between plant and animal protection in the ESA is significant. Wild plants are considered property, or part of the real estate they are attached to, whereas wild animals are not (McMahan 1980).

### Recovering Listed Species

The ESA mandates an affirmative conservation duty, and requires a recovery plan. The legal status of recovery plans is uncertain (see Question 2).

The difference between survival and recovery is an important distinction in the Act. It is not enough just to protect existing members of a listed species. They must be recovered and delisted. Only about half of the of listed species have recovery plans, and for all but a handful of species, delisting remains

an elusive goal.

As stated in the ESA,

The Secretary shall develop and implement plans ... for the conservation and survival of endangered species and threatened species ... unless he finds that such a plan will not promote the conservation of the species. The Secretary, in development and implementing recovery plans, shall, to the maximum extent practicable—

- (A) give priority to those endangered species or threatened species, without regard to taxonomic classification, that are most likely to benefit from such plans, particularly those species that are, or may be, in conflict with construction or other development projects or other forms of economic activity;
- (B) incorporate in each plan—
  - (i) a description of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species;
  - (ii) objective, measurable criteria which, when met, would result in a determination ... that the species be removed from the list; and
  - (iii) estimates of the time required and the cost to carry out those measures to achieve the plan's goal and to achieve intermediate steps toward that goal. (ESA § 4(f)(1)).

The Secretary shall, prior to final approval of a new or revised recovery plan, provide public notice and an opportunity for public review and comment on such plan. The Secretary shall consider all information presented during the public comment period prior to approval of the plan. (ESA § 4(f)(4)).

Each Federal agency shall, prior to the implementation of a new or revised recovery plan, consider all information presented during the public comment period... (ESA § 4(f)(5)).

Recovery plans identify measures that will resolve threats to the species, the time and costs associated with those measures, and objective and quantifiable criteria for determining when the species has recovered sufficiently to be delisted (ESA § 4(f)(1)(B)).

To help prepare and implement recovery plans, the Service may enlist the assistance of knowledgeable persons from public and private agencies and institutions. Recovery plans are subject to public review and comment before becoming final (ESA §§ 4(f)(4),(5), in Smith et al. 1993).

The preparation and implementation of recovery plans is the key to success under the ESA. There are many issues associated with recovery plans and several ways to make the process more effective as suggested in the literature and by this analysis (see Question 12).

## Conclusions

The ESA established the conservation of species and their ecosystems as a national goal. Although the Act has no provisions for ecosystem conservation, substantive and procedural mandates for listing, protecting, and recovering individual species make the ESA a shield for imperiled plants and animals and a sword to be used against activities that further imperil protected species. The Act also may protect many non-imperiled species because they use the same habitat that is protected for the threatened and endangered species (J.M. Scott, review comments).

## Question 2. Who is responsible for the ESA?

Two federal agencies are responsible for implementing the ESA. They are referred to collectively as "the Service" in this report, which is consistent with ESA regulations (CFR § 402.02). A number of other federal agencies and state agencies have responsibilities or interests related to ESA species conservation efforts in Idaho, and are briefly reviewed in this section.

### Federal Agencies

The ESA assigns the major responsibilities for implementing the Act to two cabinet secretaries. The Secretary of the Interior is assigned certain responsibilities under the ESA. These duties are implemented by the U.S. Fish and Wildlife Service (FWS). Similarly, the ESA assigns responsibilities to the Secretary of Commerce, which are implemented by the National Marine Fisheries Service (NMFS). Because the two "Service" agencies are authorized to write regulations to implement the ESA, they may be called regulatory agencies. The respective duties of the two agencies are not delineated in the Act, but were made in a compromise when the NMFS was created in 1970, three years before the ESA was enacted (Tobin 1990). Several conflicting jurisdictional situations have arisen since then that the agencies have been forced to sort out on their own.

In addition to its principal responsibility for regulating the harvest of marine fisheries, the NMFS was also given the responsibility for some marine mammals, including sea lions, seals, whales, dolphins, and porpoises (Tobin 1990). In the original compromise, the NMFS also was made responsible for anadromous fish, including salmon. The FWS has the responsibility for some marine mammals too, including polar bears, Florida manatees, and the southern sea otters of the Pacific coast, all of which are listed under the ESA (Tobin 1990). Marine mammal ranges are widely dispersed and there is likely no inefficiency from overlapping jurisdiction. However, the same cannot be said for the NMFS anadromous fish responsibilities.

As the case study of salmon recovery in

Idaho in **Appendix B** illustrates, the FWS has responsibility for other listed fish in the same stream, (such as bull trout if they become listed) and for listed wildlife in the same riparian zone that the NMFS is also responsible for as critical habitat for protected salmon. Moving the NMFS from offshore responsibilities to upland resource management decisions has created turmoil due to ESA section 7 interagency consultations. In Idaho, the NMFS, an agency with traditional responsibilities for regulating the commercial harvest of marine fisheries, is making decisions about whether land-use activities "jeopardize" spawning adult salmon and juvenile fish. People concerned about the efficient operations of federal agencies could make a case that the NMFS is not as well equipped as the FWS to make these difficult "jeopardy" decisions.

A third agency has a small role assigned by the ESA. The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) has a responsibility to regulate imports and exports of listed plant species. International trade in such species is substantial, but between 1978 and 1987, the APHIS had referred only three suspected violations of the ESA to the Department of Justice, while during the same period, the FWS had made more than one thousand such referrals on illegal trade in listed wildlife species (Tobin 1990).

The U.S. Environmental Protection Agency (EPA) was established as a regulatory agency in 1970. According to an agency spokesman (Serfis 1993) many people thought the agency had a mission to protect forests, lakes, estuaries, wetlands, and wildlife, and that perception is largely true. However, prior to 1988 the EPA mainly addressed ecological protection only as it was associated with human health. A new agency emphasis for the 1990s is protecting aquatic and terrestrial ecosystems, taking a "holistic approach to protecting ecological values." The EPA's role in species conservation is "to assess how more effective cooperation under the ESA can be accomplished. These efforts focus on the consultation process and on recovery plans." (Serfis 1993).

**Land and Resource Management Agencies.**

The U.S. Forest Service (USFS), Bureau of Land Management (BLM), National Park Service, and the National Wildlife Refuge System managed by the U.S. Fish and Wildlife Service—are required under section 7 of the ESA to consult with the two regulatory Service agencies. These federal land management agencies are vital to ESA success because they control and manage approximately 30 percent of the nation's land area and thus provide significant habitat for fish, wildlife, and plants (US-GAO 1995). The federal government is responsible for the control and management of 61.6 percent of Idaho's land (USDI-BLM 1994).

The USFS initiated a program in 1990 called "Every Species Counts" to bring together its resources and use them to enhance conservation and recovery of imperiled species, and the agency is committed to cooperating with other federal agencies and state agencies to prevent the need to list additional species by securing adequate habitat for them (Guardia 1994).

The USFS manages 20.4 million acres in Idaho, or 39% of the entire state. There are 13 Forest Service administrative units in Idaho, including seven National Forests in Region 4 (southern Idaho), five National Forests in Region 1 (northern Idaho), and the Hells Canyon National Recreation Area administered by the Wallowa-Whitman National Forest in Region 6. Under the ESA the USFS is obligated to protect and enhance all species listed as endangered or threatened. The agency also has a policy for sensitive species, defined as follows:

Taxa that are identified by the Regional Forester for which viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species existing distribution. (Forest Service Manual 2670).

According to Moseley (1992), this is a proactive policy to protect and manage for non-listed rare species so that they do not decline to the point where they qualify for listing under the ESA. The policy also instructs managers to assist states in their

efforts to protect rare elements of their biota. Although this policy has been around for many years, only recently has public attention begun to focus on preserving biological diversity, in general, and rare plant conservation, in particular. There has been a concomitant increase in botanists and wildlife biologists on several Idaho National Forests in recent years (Moseley 1992).

A similar situation exists in the BLM, which manages 11.8 million acres, or almost 23% of the state of Idaho. They are obligated to preserve listed species and also have a policy to manage and protect sensitive species in a proactive way, as follows:

Sensitive species are those designated by the state director, usually in cooperation with the state agencies responsible for managing the species as sensitive. They are those species that are 1) under status review by FWS; or 2) whose numbers are declining so rapidly that federal listing may become necessary; or 3) with typically small and widely dispersed populations; or 4) those inhabiting ecological refugia or other specialized or unique habitats. (BLM Manual 6840).

There are six BLM Districts in Idaho, mostly in the southern part of the state, with nearly all having either full-time or seasonal botanists on their staff. As with the USFS, the hiring of botanists to administer the rare plant programs has increased in the last few years, a trend that appears to be continuing (Moseley 1992). The BLM also has wildlife biologists working part-time or nearly full-time on the endangered species program (A. Thomas, review comments).

Although cooperation with other agencies such as the USFS, BLM, and state agencies is requisite for ESA implementation success, the responsibilities for the success of the ESA are assigned only to the FWS and the NMFS.

**U.S. Fish and Wildlife Service (FWS).** The FWS is charged with the protection and restoration of migratory birds that cross state or national borders and threatened and endangered species. The agency was established in the Department of the Interior by consolidating the former Bureau of Biological Survey from the Department of Agriculture and the Bureau of Fisheries from

the Department of Commerce. The role of the agency includes many conservation, propagation, and regulatory activities (Cubbage et al. 1993). Concise summaries of more than 20 of the federal laws protecting wildlife are provided by Cubbage et al. (1993). The FWS plays a major role in many of these laws.

The FWS oversees 443 national wildlife refuges, totaling more than 90 million acres. About 77 million acres are in Alaska, the rest are in the continental United States. The FWS has 47,061 acres in Idaho (US-GAO 1995). The FWS also operates about 75 fish hatcheries, 50 cooperative research units at state universities, and several research laboratories. The agency monitors U.S. wildlife populations, sets migratory bird hunting seasons and limits, and distributes excise tax funds. The FWS also plays a crucial role in reviewing federal environmental impact statements and administering and enforcing the ESA (Cubbage et al. 1993). The FWS has the major responsibility for implementing the ESA. The ESA (§ 15(a)(1)) currently authorizes the FWS with \$41.5 million per year to implement the Act, which is less than 5 percent of the agency's budget.

**Training FWS Personnel to Implement the ESA.**—Up until four years ago, training of FWS personnel in regards to ESA was decentralized and not uniform (N. Kaufman, pers. comm; G. Kinser, pers. comm.). Before the early 1990s, a small corps of individuals from the Washington, D.C. office would go out to each FWS regional office periodically and conduct training for project leaders. It was left up to the project leaders to either train the rest of the field staff themselves or see that they were trained.

Approximately four years ago, the training system changed with the creation of the Training Division within the FWS. The training system is now more centralized and formalized. A new, national training facility is being built at Shepardstown, West Virginia.

Every biologist entering the FWS' Ecological Services Division goes through a basic training course that includes training on ESA regulations as well as other FWS programs. The ESA training received by Ecological Services biologists is more extensive than biologists entering the Fisheries

or Refuges Divisions would get because Ecological Services personnel are working directly with ESA implementation. This basic training program began only about two years ago, and at most 200 biologists have completed it (G. Kinser, pers. comm.).

The training division also has started short courses in the section 4 listing process, candidate species conservation, section 7 consultation, and section 10 Habitat Conservation Plans (US-FWS 1995d). These courses are new, and at this writing have been offered twice at the most (G. Kinser, pers. comm.). Another course specifically for managers has been used to train 20 to 25 regional level managers so that they can better train their field personnel (G. Kinser, pers. comm.).

In the past, differences may have existed in the way the ESA was implemented in different regions of the FWS because of differences in the training of personnel between regions. Now with more centralized and uniform training, these regional differences should be lessened; however, differences may still exist because of the scale of projects, the work load of the region or office, and personalities of individuals (N. Kaufman, pers. comm.).

#### **National Marine Fisheries Service (NMFS).**

The Fish and Wildlife Act of 1956 created two bureaus in the FWS—one for commercial fisheries and one for sport fisheries. This split of organizational responsibilities did not function smoothly and led in 1970 to the transfer of the Bureau of Commercial Fisheries to the Department of Commerce, where it was renamed the National Marine Fisheries Service (NMFS) and eventually placed under the National Oceanic and Atmospheric Administration. With the 1970 reorganization came a decision giving the NMFS responsibility for anadromous fish and splitting the management authority for marine mammals. The FWS in Interior retained authority for manatees, walrus, sea otters, and polar bears. The NMFS in Commerce became responsible for seals, whales, dolphins, porpoises, and sea lions. This division of responsibility had nothing to do with the protection of endangered species, but reflected the agencies' interests, abilities, and

preferences as well as some element of compromise (Tobin 1990).

Following the enactment of the ESA in 1973, the FWS and the NMFS came into conflict regarding which agency would have jurisdiction over sea turtles, which lay their eggs on beaches. After delay and frustration, the two agencies jointly listed three species of sea turtles and split jurisdictions between sea and land to the NMFS and the FWS, respectively. Through mid-1989, other than these three turtles, the NMFS had listed only four species, only one—the Guadalupe fur seal—a native to the United States. The NMFS has shown a general lack of concern for the ESA, and assigned all responsibilities and functions to one person (Tobin 1990). Salmon changed that.

In 1989, the winter run of chinook salmon in California's Sacramento River was listed as threatened under emergency procedures. The species is now endangered. This listing was followed shortly by petitions for several runs of salmon in the Snake River, which are now officially threatened. As the adult salmon leave the ocean to begin their spawning runs in freshwater rivers, the NMFS' traditional responsibility for regulating ocean and river commercial harvests now travels upriver with the fish, propelled relentlessly by the genetic pulse to spawn. NMFS has the responsibility for maintaining spawning areas and rearing habitat for juvenile salmon in freshwater streams and rivers, and for the critical habitat designated in streamside riparian areas. This responsibility is by default, not by design. Things are not going as smoothly as they might be able to (see salmon case study in **Appendix B**).

The ESA (§ 15(a)(1)) currently authorizes \$6.75 million for the NMFS to carry out its duties under the Act.

### Idaho State Agencies

This section was drafted by Troy Merrill, and improved by Philip Cook, Kelly Rogers, and the comments of many reviewers.

The two federal "Service" agencies with regulatory authority for implementing the ESA find themselves in what Tobin (1990) called a "marital arrangement" with the states, the

places where listed species are found (Tobin 1990).

State agencies, including those that administer state lands, are not required by the ESA to consult with the Service on actions that may affect endangered species. They are, however, subject to section 9 prohibitions on taking an endangered species, defined through regulation to include "significant habitat modification." Actions on state lands may be subjected to section 7 consultation if the action involves federal funding for all or in part, or requires a federal license or permit because section 7 applies to all federal agency actions regardless of the ownership of the land on which the action takes place. As pointed out in the salmon case study in **Appendix B**, the federal connection can include access to state or federal lands on federal forest roads.

A variety of state agencies have certain responsibilities dealing with imperiled species and their habitat needs.

### *Idaho Department of Fish and Game (IDFG).*

To the extent that the ESA involves the state, the Act looks to the IDFG as the lead state agency. Cooperative agreements, for example, must in general be carried out by the IDFG. Also, the IDFG is the repository for most information regarding the various species within Idaho; thus, the Service relies heavily upon the IDFG for information and technical support in both the listing and recovery decisions (C. Strong, review comments).

The IDFG is also the agency in the best position to warn the state of potential future problems so that corrective actions can be taken to head off an ESA listing (C. Strong, review comments). The IDFG also calls upon the federal government to play an important role in shaping species recovery plans. IDFG sits on many of the key decisionmaking bodies that provide input to the Services' efforts (C. Strong, review comments).

The IDFG is actively involved in the recovery of several federally listed species including; woodland caribou, peregrine falcons, bald eagles, and grizzly bears. The Idaho Nongame, Endangered and Watchable Wildlife program is actively evolving into an ecosystem-level program and attempting to spend its limited resources on preserving or



restoring the system of habitats required by many species, some of which may be imperiled, as opposed to recovering a single species (Melquist 1993a).

Idaho does not have endangered species legislation. However, the IDFG maintains its own list of imperiled species within the state (see Question 6). Under Idaho Code it is illegal to take or possess those species classified as threatened or endangered at any time or in any manner (Melquist 1993a).

The ability of the state to take the initiative in endangered species recovery is severely limited by lack of funding. Most state programs for imperiled species are heavily dependent upon voluntary contributions, such as tax form checkoffs, or sale of special license plates. The lack of funding prevents the implementation of recovery plans for more than a few of the state-listed species that are not also federally listed (Griffin and French 1993).

Idaho's Nongame, Endangered and Watchable Wildlife Program budget of \$700,000 comes from a variety of sources, including a nongame checkoff on state income taxforms and special license plates (Melquist 1993a). Because of competition from other checkoffs, revenues from this source declined to a low of \$47,000 in 1994. The remainder of the funding is obtained from federal aid funds, state and federal agencies, grants trusts, and the sale of goods. Since 1979, as much as \$294,000 per year of the nongame budget has come from ESA section 6 funding. These monies are directed toward the goal of insuring the viability of nongame populations, including threatened and endangered species, and their habitats in Idaho.

**Idaho Conservation Data Center (CDC).** In 1984, the Idaho Department of Fish and Game and The Nature Conservancy cooperatively initiated the Idaho Natural Heritage Program. The purpose of this program was to develop a centralized data management system to collect, store, and disseminate information on the status and distribution of rare plants and animals and examples of high-quality native plant communities throughout Idaho (Melquist 1993a). This worldwide information network was developed by The Nature Conservancy,

and is directed toward the conservation of biological diversity. These data are widely used by federal, state, and municipal agencies, as well as private groups and individuals, for the proactive management and conservation of rare species in Idaho (Moseley 1992).

At the time of its implementation, Idaho's was the 32nd such natural heritage program in the country. Today, it is one of 50 state programs, and is an integral part of a network of the most complete national and international databases on biological diversity (Melquist 1993a). The database now contains over 8,500 records (R. Moseley, review comments) on more than 100 of Idaho's rare animal species, 300 plant species, and 500 plant communities. Resident fish were recently added to the database (Melquist 1993a).

In 1987, the Heritage program was merged into the Department's Nongame Program with the nongame biologist and plant ecologist moving from being Nature Conservancy employees to staff biologists in the Wildlife Bureau. Confusion about the function and staffing of the Idaho Natural Heritage Program prompted the Department to change the name of the heritage program to the Idaho Conservation Data Center (CDC), a name that more accurately reflects the primary function of the program (Melquist 1993a).

Over the last few years, the CDC nongame biologist and plant ecologist have spent the bulk of their time conducting inventory, monitoring, and research projects on rare animals and plants. Data which they collect in the field are mapped and computerized at the CDC office in Boise. Reports are written for the cooperating agency, and printouts on all species tracked in the database are provided annually to database cooperators such as the U.S. Forest Service. Department staff collect information on rare species from as many sources as possible throughout the state (Melquist 1993a) and disseminate this information to a wide variety of federal, state, county, and municipal users, as well as private companies, organizations and individuals. Disseminating information is a large part of CDC's business, serving more than one thousand user requests per year (R. Moseley, review comments).

**Idaho Department of Parks and Recreation (IDPR).** Idaho has a rare plant protection law that is administered by the IDPR. According to Moseley (1992), it is largely meant to protect wildflowers from being removed along public roads (see *Idaho Code* § 18-3911):

(1) It is the duty of all citizens of this state to protect the wildflowers of this state referred to in this section from needless destruction and waste.

(2) It shall be unlawful for any person in this state to wilfully and negligently cut, dig up, trim, pick, or remove, any plant, flower, shrub, bush, fruit or other vegetation growing upon the right of way of any public highway within this state.

(3) It shall be unlawful for any person to export from this state, or to sell or offer for sale or transport bulbs, corms, rhizomes, roots, or plants of native wild flowers or shrubs of the state of any of the following genera: [15 species are listed].

Moseley (1992) pointed out other sections in the law dealing with exemptions for highway workers, prosecution of violators, and, most importantly, authority to amend the list "in order to further protect native wild flowers from needless destruction and waste." Only three of the 15 species listed in the *Idaho Code* are currently on the Idaho rare plant list. This law has never been enforced, although it has allowed the State of Idaho to enter into a cooperative agreement with the FWS and qualify for federal matching money by way of a "limited authorities agreement" with FWS under section 6 of the ESA for rare plant conservation activities (Moseley 1992).

**Idaho Department of Water Resources (IDWR).** The Idaho Department of Water Resources (IDWR) is the agency responsible for administering water use in accordance with state water laws, which are based on the prior appropriation doctrine. This means, briefly, that the first individual to put water to a beneficial use historically establishes the right to continue that use (Merrill and O'Laughlin 1993).

The prior appropriation doctrine's policy of "first in time, first in right" helped foster the development of the West in the 19th century (Shupe 1989). According to Tarlock (1991),

the classic prior appropriation doctrine is premised on these basic assumptions: 1) water is owned by the state and held in trust for the public, 2) the optimal use of water will result from a system that maximizes private uses and minimizes public uses, 3) private rights should be as secure as possible, 4) rights are based on the priority of application to a beneficial use and endure as long as the beneficial use continues, 5) the whole stream can be diverted during times of peak demand, and 6) a "call" on the water can only be rejected if it would be futile (Tarlock 1991).

Many people have subscribed to the notion that the prior appropriation doctrine is "rigid and unforgiving" (C. Strong, review comments). In reality, it is a "very fluid doctrine" that is still in its infancy and growing and expanding to meet the changing times. For example, almost all western states now have provisions under the doctrine for instream flows, and public interest is an important component in any decision to issue a water right (C. Strong, review comments).

Of the 18 species listed as threatened or endangered in Idaho, the cause of endangerment for nine of them is directly related to water policy, including the use of water for hydropower. Identifying water policy as the cause of endangerment for these species is relatively easy; removing those causes is not. In the northern part of the state there is still unappropriated water, for which the Idaho Water Resource Board is in the process of establishing instream flow rights. While the instream rights are not specifically for the protection of endangered species, salmon and bull trout will benefit from instream flow reservations. Perhaps more important is the potential to prevent future listings by protecting aquatic habitat needed by a multitude of species.

In the southern part of the state there is no unappropriated water, and little opportunity for instream flow reservations and associated management. Trying to provide for the needs of endangered species may come into conflict with the system of rights and contracts that control water. These rights are currently being sorted out in the Snake River adjudication process.

**Idaho Water Resource Board (IWRB).**

Created by the Idaho Constitution (Article 15 § 7), the Board is charged by the Legislature with formulating the State Water Plan, "an integrated, coordinated program for conservation, development, and use of all unappropriated waters of this state in the public interest" (*Idaho Code* § 1734 A). The Board must take into account all interests in the development of the plan (C. Strong, review comments). The Board is also mandated (*Idaho Code* § 42-1761) to operate a water supply bank (F. Sherman, review comments). The Board thus will play a role in the conservation of species that depend on quantities of water for which stored water may be necessary. Further discussion of this important topic is in the salmon case example in **Appendix B**.

The Idaho State Water Plan is a comprehensive set of policy statements involving water quality and quantity. The State Water Plan is also a guide to water resource management, and consists of a "series of objectives and policies." Seven "objectives" are laid out in the plan: (1) public interest, (2) economic development, (3) environmental quality, (4) public safety, (5) fish, wildlife, and recreation, (6) agriculture and aquaculture, and (7) quantification of water rights.

The most recent Idaho State Water Plan (IWRB 1992) was adopted by the Idaho Water Resource Board in January 1992. The Plan serves "to guide the development, management, and use of the state's water and related lands" (p.1). The Plan is a dynamic document with a formal review at least every five years. A new Plan must be approved by the Board and changes are subject to review by the Idaho Legislature.

As originally described in 1976, the Plan consists of three parts: Part One—Objectives, Part Two—Policies, and Part Three—River Basin Studies. Parts One and Two have been revised several times since 1976 and are published as one document. In 1988 work began on the components of Part Three, and each river basin study will be published separately.

The ESA is specifically mentioned only once in the 1992 Plan. The section describes in general that endangered species exist in

Idaho and that recovering those species will affect Idahoans and their land and water management. The section states that the FWS administers the ESA (IWRB 1992, p. 12).

Endangered species are mentioned in the description following Policy II—Water Resources Research Program—"It is the policy of Idaho to encourage and develop research on important water resource topics to implement the objectives of the State Water Plan." Under topics that need immediate attention is "investigate the number and range of species that are threatened or endangered" (IWRB 1992, p.18).

Endangered species are mentioned again in the description following Policy 2C—Anadromous Fish—"It is the policy of Idaho to preserve and enhance the state's anadromous fishery resource." The description states that the listing of the Snake River sockeye and the proposed listing of the spring, summer and fall chinook salmon runs (now listed) "as federal threatened or endangered species could lead to radical changes in water management in the Columbia and Snake River Basin" (IWRB 1992, p.20).

Although not specifically mentioned, most of the objectives and policies in the Plan have potential impacts for endangered species and the ESA. The objectives and policies mentioned below are the most relevant ones.

Objective 3 directs the Board to "maintain, and where possible enhance, environmental quality" (p.15). Objective 5 states that the board "is to assure that equal consideration is given to the needs of fish, wildlife, and recreation in any project or program involving the water resources of the state" (IWRB 1992, p.15).

Policy 1C—Beneficial Use of Water—states that "certain non-consumptive water uses be considered as beneficial uses" (p.16). Policy 2C—Instream Flows—states that when it is in the public interest the board should "seek to appropriate waters in the state for instream flow purposes" (p.19). Fish and wildlife habitat and aquatic life are specifically mentioned in the description following both policies.

Policy 2D—White Sturgeon—states that "white sturgeon habitat in the Snake and Kootenai Rivers be protected" (p.20). Policy

2E—Watersheds—states that "it is the policy of Idaho to encourage land-use practices which protect the quality and quantity of the water resource" (IWRB 1992, p.20).

On the other side, Objective 2 states that the board is "to encourage and support water projects that promote economic development in the state" (p.15). Objective 6 states that the board is to "encourage orderly and efficient growth in food and fiber production within the state" (p.15). Several of the policies address protection of potential reservoir and hydropower sites from significant land use changes.

Several of the objectives and policies address the relationship between the state and federal governments, and therefore may have an impact on implementation of the ESA. Objective 7 states that the Board is to quantify all water rights within the state "including those rights held by the federal government" (p.15). Policy 4K—Determination of Federal Reserved Rights—reaffirms that objective by stating that Idaho should quantify all federal reserved water rights within the state through negotiations and plan for the protection of existing state water rights through resource management and project development. Policy 4C—Federal Water Allocation—states that an agreement should be reached with federal agencies to allow the board to review any proposed allocations of water from federal reservoirs over 500 acre-feet annually.

Policy 1A—State Sovereignty—makes the strongest statement in the Plan about the relationship between federal and state rights:

It is the policy of Idaho that the state has sovereignty over decisions affecting the development and use of its water resources, and that the state opposes any attempt by the federal government, its management agencies, any other state, or any other entity to usurp the state's role in these areas. (IWRB 1992, p.16).

Nothing in the Idaho State Water Plan addresses what action will be taken if there are conflicts between federal and state plans for water allocations, but the potential for such conflicts exists in designating critical habitat and developing recovery plans under the ESA.

*Idaho Attorney General's Office (IAG).* The

IAG serves largely as a process office, acting in many instances as a traffic cop when agencies come into conflict. At the forefront of all litigation the IAG often sees the landmines and counsels agencies on preventative actions that can be taken. The IAG provides legal analysis of state obligations under the ESA, which establishes sideboards on the state positions. The *Idaho Department of Fish and Game v. National Marine Fisheries Service* (850 F.Supp. 886 [D.Oregon 1994]) litigation, for example, has helped to shape the state role under the ESA (C. Strong, review comments).

In that litigation, the court held that the NMFS finding of "no jeopardy" to listed Snake River salmon species from hydroelectric power operations on the Columbia River System was arbitrary and capricious. Judge Malcolm Marsh found the effort to save the salmon "seriously, 'significantly,' flawed because it is too heavily geared towards a status quo that has allowed all forms of river activity to proceed in a deficit situation—that is, relatively small steps, minor improvements and adjustments—when the situation literally cries out for an overhaul" (Brown 1995). Since Judge Marsh's opinion in 1994, federal agencies have returned to the table with revision proposals (see **Appendix B**) for managing the Columbia River in such a way that will not "jeopardize" the continued existence of salmon (Brown 1995).

*Idaho Department of Lands (IDL).* Idaho has approximately 2.5 million acres (4.5% of the state's land area) in the state endowment trust. These "endowment lands" were acquired at statehood by federal grants to provide funding for schools and other specific purposes. The State Board of Land Commissioners is charged with the administration of these lands, and is composed of the Governor, Secretary of State, Attorney General, State Controller, and Superintendent of Public Instruction, serving as trustees to the endowment trust (IDL 1993).

The IDL carries out the constitutional functions of the Board. The Idaho Constitution (Article IX, section 8) charges that the endowment trust lands be managed "in such manner as will secure the maximum long-term financial return to the institution to which

granted." According to IDL, this carries with it "statutory and ethical requirements to manage endowment lands for the long term under existing water quality laws and sound land and resource management practices." (IDL 1993, p. 3).

Another significant role of lands is the regulation of the beds and banks of navigable bodies of water. Under the equal footing doctrine, title to these lands came into state ownership upon statehood. They are managed under the public trust doctrine for the benefit of all citizens (C. Strong, review comments). The IDL is not required to consult with the Service under section 7 of the ESA. IDL is subject to prohibition and penalty for taking under section 9 of the ESA. State lands provide habitat for several protected species (Table 2-1), so there is a potential for actions on state lands to be affected.

Table 2-1. Concentration of endangered, threatened, or candidate terrestrial vertebrate species on state lands in Idaho.

Number of Species	Acres of State Land	Percent of Total
1 species	165,487	6.38
2 species	698,445	26.95
3 species	735,884	28.40
4 species	676,300	26.10
5 species	168,232	6.49
6 species	131,699	5.08
7 species	11,754	.45

No endangered, threatened or candidate terrestrial vertebrate species occur exclusively on State of Idaho land. This, coupled with the scattered ownership pattern of state lands, has reduced the restrictions placed on actions on state lands as a result of the ESA. Recent developments have increased the possibility that this will change in the future. First, citizen groups were successful in forcing the designation of critical habitat through the courts for the northern spotted owl. Although this species is not Idaho, critical habitat is an issue with several Idaho species, including

woodland caribou, grizzly bears, and possibly gray wolves because critical habitat is designated for them in Minnesota. Snake River salmon have designated critical habitat, and this does affect state lands. Second, there is increasing interest and support in protecting ecosystems in which endangered species occur. Third, actions by the IDL are subject to increasing comment and review by citizens. Fourth, access to state lands sometimes involves permits to use federal roads, subjecting IDL to ESA section 7 consultation (see the **National Forest Road Use Permits** section in **Appendix B**).

The likelihood of IDL actions being subject to ESA restrictions is greatest in northern Idaho where IDL has concentrated holdings of larger blocks of timberlands. Such concentration increases the efficiency of management, and has also resulted in the State of Idaho being the largest landowner in areas that some observers consider to be essential for endangered species recovery; i.e., critical habitat.

The IDL can have tremendous impact on preventing future listing by removal of threats through the Idaho Forest Practices Act (FPA), which applies to all forest lands in the state (C. Groen, review comments). The IDL administers the FPA, which "contains rules designed to assure the continuous growing and harvesting of forest tree species and to protect and maintain forest soil, air, water resources, wildlife, and aquatic habitat. It is an essential water quality management tool on forested lands" (IDL 1993, p. 9).

#### **Idaho Division of Environmental Quality (IDEQ).**

IDEQ has the overall state responsibility for implementing the federal Clean Water Act. The agency thus has an indirect but important role in species conservation. Half of the listed species in Idaho are fishes and snails that live in an aquatic environment. Bald eagles and whooping cranes are also dependent on aquatic environments.

#### **Federal/State Relationships**

Through the end of the nineteenth century states had exclusive responsibility for wildlife.

According to Tobin (1990), they jealously guarded this prerogative. But, as Scott (review comments) noted, the states historically emphasized management of game species. Although federal laws have gradually eroded the presumption of state primacy, the ESA still recognizes the states' interests in resident wildlife, particularly during the listing process (Tobin 1990). In order to incorporate states' views into ESA decisions, the Service is required to notify and accept comments from affected states and counties before listing species found within those states and counties. This process can involve negotiation and occasionally compromise because states that oppose listing of a species may get sympathetic congressional involvement, and hence effective pressure on the Service. Also, state fish and wildlife officials outnumber their federal counterparts, so to attain species conservation goals the Service is dependent to some extent on the cooperation of the states (Tobin 1990).

In section 6, the ESA provides a mechanism for cooperative agreements between the federal and state governments in species conservation efforts. The writers of the ESA envisioned a cooperative relationship between the states and the FWS and NMFS, but such cooperation has not always been forthcoming; moreover, federal grants are supposed to create incentives for cooperative agreements, but irregular and often parsimonious funding has "probably angered and alienated" many states (Tobin 1990). For example, from 1981 to 1990, overall ESA funding nearly tripled, yet cooperative funding for states through ESA section 6 increased by only 70 percent (Graham 1993). All 50 states have section 6 cooperative agreements for animals, and 44 states have plant agreements. To carry out section 6 provisions, Congress is authorized to deposit an amount equivalent to 5 percent of the federal aid to wildlife restoration fund (Pittman-Robertson Act) and the sport fishing restoration account (Dingell-Johnson Act), which is roughly \$18 million per year. The current appropriation is about one-half of that (Melquist 1995).

Aside from the funding issues, relations between the federal Service agencies and states are sometimes strained by different perspectives on the mix of development and

species conservation activities. Tobin (1990) cited the examples of the failed attempt to designate critical habitat for grizzly bears in the 1980s and the proposed—and now actual—reintroduction of gray wolves.

In recognition of some of the problems with the cooperative federal/state relationship, in July 1994 the FWS and the NMFS issued a policy statement on the role of state agencies in ESA activities (Sidebar 2-1).

The remainder of the **Federal/State Relationships** section is based on an original contribution by Professor Dale Goble (pers. comm.)

***Cooperative Federalism and Imperiled Wildlife.*** Many environmental problems are traceable in part to the federal system: competition between states for jobs and revenue can foster competition in lax regulation. Pollution, in other words, often smells too much like jobs. Many of the environmental statutes enacted during the 1970s employed a structure known as "cooperative federalism" in an attempt to meet two objectives. On the one hand, Congress was concerned that national interests suffered because the states gave priority to their individual interests. As Senator Tunney (D-Calif.) stated in the debates on the ESA, "No one State should be responsible for balancing its interests, with those of other States, for the entire Nation." Central authority is necessary to oversee endangered species protection programs and to insure that local political pressure does not lead to the destruction of a vital national asset. To protect this national interest, Congress enacted national standards for environmental problems ranging from air and water pollution to surface coal mining reclamation and endangered species conservation.

At the same time, however, political and economic reality counseled the involvement of state governments. For example, the Senate report on one of the antecedents of the Act noted that state wildlife agencies employed approximately 6,000 enforcement agents while the federal government employed 158—"most of whom were located in ports of entry." Similarly, several speakers during the 1973 House hearings emphasized the variability of

### Sidebar 2-1. Policy Statement by the FWS and the NMFS on State Agency Roles in the ESA

**Background.** The Services recognizes that, in the exercise of their general governmental powers, States possess broad trustee and police powers over fish, wildlife and plants and their habitats within their borders. Unless preempted by Federal authority, States possess primary authority and responsibility for protection and management of fish, wildlife and plants and their habitats.

State agencies often possess scientific data and valuable expertise on the status and distribution of endangered, threatened and candidate species of wildlife and plants. State agencies, because of their authorities and their close working relationships with local governments and landowners, are in a unique position to assist the Services in implementing all aspects of the Act. In this regard, section 6 of the Act provides that the Services shall cooperate to the maximum extent practicable with the States in carrying out the program authorized by the Act. The term State agency means any State agency, department, board, commission, or other governmental entity which is responsible for the management and conservation of fish, plant, or wildlife resources within a State.

**Policy.** In the following Endangered Species Act programs, it is the policy of the Services to:

#### A. Prelisting Conservation

1. Utilize the expertise and solicit the information of State agencies in determining which species should be included on the list of candidate animal and plant species.
2. Utilize the expertise and solicit the information of State agencies in conducting population status inventories and geographical distribution surveys to determine which species warrant listing.
3. Utilize the expertise of State agencies in designing and implementing prelisting stabilization actions, consistent with their authorities, for species and habitat to remove or alleviate threats so that listing priority is reduced or listing as endangered or threatened is not warranted.
4. Utilize the expertise and solicit the information of State agencies in responding to listing petitions.

#### B. Listing

1. Utilize the expertise and solicit the information of State agencies in preparing proposed and final rules to: (a) List species as endangered or threatened, (b) define and describe those conditions under which take should be prohibited for threatened species, (c) designate critical habitat, and (d) reclassify a species from endangered to threatened (or vice versa) or remove a species from the list.
2. Provide notification to State agencies of any proposed regulation in accordance with provisions of the Act.

#### C. Consultation

1. Inform State agencies of any Federal agency action that is likely to adversely affect listed or designated critical habitat; or that is likely to adversely affect proposed species or proposed critical habitat and request relevant information from them, including the results of any related studies, in analyzing the effects of the action and cumulative effects on the species and habitat.
2. Request an information update from State agencies prior to preparing the final biological opinion to ensure that the findings and recommendations are based on the best scientific and commercial data available.
3. Recommend to Federal agencies that they provide State agencies with copies of the final biological opinion unless the information related to the consultation is protected by national security classification or is confidential business information. Decisions to release such classified or confidential business information shall follow the action agency's procedures. Biological opinions, not containing such classified or confidential business information, will be provided to the State agencies by the Services, if not provided by the action agency, after 10 working days. The exception to this waiting period allows simultaneous provision of copies when there is a joint Federal-State consultation action.

#### D. Habitat Conservation Planning

1. Utilize the expertise and solicit the information and participation of State agencies in all aspects of the Habitat Conservation Planning (HCP) process.

#### E. Recovery

1. Utilize the expertise and solicit the information and participation of State agencies in all aspects of the recovery planning process for all species under their jurisdiction.
2. Utilize the expertise and solicit the information and participation of State agencies in implementing recovery plans for listed species. State agencies have the capabilities to carry out many of the actions identified in recovery plans and are in an excellent position to do so because of their close working relationships with local governments and landowners.
3. Utilize the expertise and authority of State agencies in designing and implementing monitoring programs for species that have been removed from the list of Endangered and Threatened Wildlife and Plants. Unless preempted by Federal authority, States possess primary authority and responsibility for protection and management of fish, wildlife and plants and their habitats, and are in an excellent position to provide for the conservation of these species following their removal from the list.

wildlife populations: Representative Breaux (D-Louisiana), for example, asked almost every witness about Louisiana's alligators, which he thought had multiplied to the point that they should be delisted even if those in neighboring states should not. Congress therefore sought to encourage state involvement in the implementation and enforcement of the national standards. The House report on the ESA's other antecedent expressed the hopeful goals of cooperative federalism as the integration of "federal agencies, [which] have broad policy perspective and authority, and the state agencies, [which] have the physical facilities and the personnel to see that state and federal endangered species policies are properly executed."

While there are variations on the theme of cooperative federalism, the theme itself is simple: a federal statute (and the administrative rules implementing it) create a detailed regulatory structure; a state adopts a "program" of corresponding statutes and rules to carry out the federal regulatory structure; the state program is submitted to the federal agency for approval; if it is approved, the state assumes primary implementation authority, often with a federal grant-in-aid funding much of the program; if the state does not submit a program, the federal agency administers the Act.

With passage of the ESA, Congress explicitly recognized the importance of developing state/federal cooperation. The conference report accompanying the adoption of the ESA reads in part "The successful development of an endangered species program will ultimately depend upon a good working arrangement between the federal agencies, which have broad policy perspective and authority, and the state agencies, which have the physical facilities and the personnel to see that state and federal endangered species policies are properly executed" (Ernst 1991, p. 101).

**The Design of ESA Section 6.** Section 6 of the ESA addresses the relationship between federal and state governments in implementing the Act. Its significance is in determining who does what. Like all relationships between

these two levels of government, the situation is complex.

The authority to regulate wildlife, most particularly when and how an animal can be reduced to possession, traditionally resided in the individual states. However, the need for increased national protection for species faced with extinction lead to this authority being reduced in the ESA. The Act authorizes federal regulation unless certain conditions are met that allow states to resume authority over listed species. The traditional state role in managing resident species of wildlife thus has been a major issue in the takings issue. This had led to tension between state and federal wildlife managers.

The most coherent reading of the various statements in the legislative history of the ESA is as follows. The Act granted the federal government jurisdiction over listed species and concomitantly deprived states of authority to regulate taking of listed species; if a state negotiated a cooperative agreement, it would acquire authority to regulate the taking of listed species; the state's reacquired authority would not, however, displace federal authority. In a cooperative-agreement state, both federal and state agencies would have jurisdiction to enforce takings prohibitions. The House report thus indicates that its drafters thought that the language they chose authorized the use of either federal or state law—"whichever seems most appropriate in the circumstances of a given case." In short, the language in the reports is at odds with a literal reading of the statutory language in section 6 of the ESA, which seems to indicate that federal law ceases to apply once a state has entered into a cooperative agreement.

Three aspects of the federal-state relationship are addressed in section 6 of the ESA. First, section 6(c) establishes a framework for federal-state collaboration by authorizing the creation of cooperative agreements. The Secretary is to enter into a cooperative agreement with any state that establishes "an adequate and active program for the conservation of" listed species that is "in accordance with" the Act. Once a cooperative agreement has been finalized, the state assumes primary responsibility for implementing conservation programs for listed



species.

Second, section 6(d) authorizes federal grants-in-aid to cooperating states to assist in paying for the costs of the state's endangered species program.

Third, section 6 explicitly addresses the preemptive scope of federal law when cooperation fails to produce uniformity. Section 6(f) specifies that two categories of state laws are preempted; state laws that conflict with federal permits controlling the importation, exportation, or commerce in listed species are void as are state prohibitions on taking listed species that are less restrictive than federal law.

One of the most confusing parts of the ESA lies in an ambiguity arises from the interaction of section 6(f) with 6(g), which covers the transition period between federal and state primacy. The third sentence in section 6(f) specifies that federal law is to be a floor on the protection of listed species:

Any State law or regulation respecting the taking of an endangered species or threatened species may be more restrictive than the exemptions or permits provided for in this Act or in any regulation which implements this Act but not less restrictive than the prohibitions so defined. (ESA § 6(f)).

At the same time, section 6(g) provides that state rather than federal law applies within a state that has entered into a cooperative agreement with the Secretary:

The prohibitions set forth in or authorized pursuant to section 4(d) [authorizing the Secretary to promulgate regulations prohibiting the taking of threatened species] and 9(a)(1)(B) [prohibiting the taking of endangered species] shall not apply with respect to the taking of any resident endangered species or threatened species ... within any State ... which is then a party to a cooperative agreement with the Secretary ... except to the extent that the taking of any such species is contrary to the law of such State. (ESA § 6(g)).

Thus, although section 6(f) preempts state laws on takings that are less restrictive than the Act, section 6(g)—and related provisions elsewhere in the Act—provide that state law on taking governs in a state that has entered into a federal-state cooperative agreement. If state law on takings is less restrictive than the ESA,

does that law govern once the state has entered into a cooperative agreement? Is the less-restrictive state law preempted? May the Secretary approve a cooperative agreement that contains less restrictive takings prohibitions? These questions do not have clear answers, and are revisited in later sections beginning with *The "Floor" of Federal Protection* and ending at the **ESA and Indian Nations** section of the chapter. It is a murky but important issue as to whether states can set taking standards.

#### *Cooperative Agreements* (ESA § 6(c)).

Section 6(c) follows the general pattern of cooperative federalism, and specifies a series of requirements: the state's conservation program must be "[i]n furtherance of the purposes of the Act," it must be "in accordance with" the Act, and it must "an adequate and active program" by meeting either of two alternative lists of criteria. To qualify for a cooperative agreement, a state is required to submit a copy of its proposed conservation program to the Secretary. Unless the Secretary determines within 120 days that the proposed state program "is not in accordance with this Act" or is not "an adequate and active program for the conservation of" listed species, the Secretary is to enter into a cooperative agreement with the submitting state. If the state's program is approved, the state may assume management authority under the terms of the cooperative agreement and it is entitled to be considered for financial assistance in the operation of its program.

Section 6(c) contains two sets of criteria under which a state's program may be found to be "adequate and active." Under the first, which was included in the 1973 ESA, a state is required to demonstrate that it has adequate authority to satisfy five criteria:

- (A) the state agency must have authority "to conserve" species listed as endangered or threatened by either the state agency or the Secretary;
- (B) the state agency must have "established acceptable conservation programs" for *all* resident species listed by the Secretary as either endangered or threatened;
- (C) the state agency must have authority to

conduct investigation to determine the status and survival requirements for resident fish and wildlife;

- (D) the state agency must have authority to establish programs to conserve listed species, including the authority to acquire land; and
- (E) the program must allow the public to be involved in decisions on the listing of species. (ESA § 6(c)).

The first two requirements proved troublesome for several state agencies that lacked sufficiently broad authority to conserve *all species* that might be listed by the Secretary as endangered or threatened. In 1977, Congress sought to facilitate federal-state cooperation by providing a different set of criteria. The Secretary may enter into a cooperative agreement with a state agency if it has authorities that satisfy criteria (C) through (E) above and includes plans that give immediate attention to those resident, listed species determined by the Secretary and the state to be "most urgently in need of conservation programs."

The Act requires the state program to include two types of information. The first is the collection of laws and regulations that create a state agency (or agencies) and delegate that agency the powers required by the Act's enumerated criteria; in general, these require the state agency to have adequate authority in areas of law enforcement, research, habitat acquisition, and conservation. The second type of information is a set of plans for the conservation of individual species.

The Secretary is required to review all federal-state cooperative agreements annually to determine under the criteria that the conservation programs continue to be "adequate and active." The annual review is to confirm that a state's program "reflect[s] new laws, species lists, rules and regulations."

Prior to the enactment of the ESA in 1973, the Council on State Governments, the President's Council on Environmental Quality, the Environmental Protection Agency, and the Department of the Interior sponsored a National Symposium on State Environmental Legislation. The Symposium produced a proposed state law on nongame and endangered species. After the passage of the ESA, the Department of the Interior promoted

the proposed law as sufficient to meet the requirements of the Act.

***Allocation and Appropriation of Funds*** (ESA §§ 6(d),(i)). To aid in the development of these cooperative arrangements, section 6 of the ESA provides financial assistance to the states for managing resident threatened and endangered species. The conference report accompanying the adoption of ESA reads in part "...The conferees wish to make it clear that the grant authority must be exercised if the high purposes of this legislation are to be met." (Ernst 1991, p. 101).

Once a state has entered into a cooperative agreement, it is eligible for financial assistance in "the development" of its conservation plans and in monitoring the status of candidate species and recovered species. The primary mechanism through which financial assistance is provided to the states is a "project agreement." A project agreement documents the actions to be taken by the state and the Secretary to conserve a listed species; it must also include a cost-benefit analysis of the proposed actions and an allocation of the costs between the federal and state governments. The Act limits the federal share of a project to no more than 75% of the project's total cost for agreements involving one state and 90% of costs for agreements involving two or more states. According to Ernst (1991), variable and generally inadequate appropriations have restricted the success of this part of the Act. Groen (review comments) suggested that lack of direction on where money can be spent also has limited the success.

The Act also establishes seven criteria that the Secretary is to employ in allocating appropriated funds among various projects.

The Act creates a special fund—the Cooperative Endangered Species Conservation Fund—in the Treasury. The fund is five percent of the monies in two other wildlife restoration funds. The first is the Wildlife Restoration Fund from the Pittman Robertson Act. Pittman Robertson authorizes an 11 percent excise tax on sporting arms ammunition and a number of other sporting goods and allocates funds back to the states based on the number of licensed hunters and the area of the state (Trefethen 1966). The

second is the Aquatic Resources Trust Fund from taxes imposed on sport fishing and recreational boating equipment and fuel through the Dingell Johnson Act. Combined with monies from the Pittman Robertson and Dingle Johnson acts, section 6 grants to the states contributed 72.5% of the funding for state (including Puerto Rico) endangered species programs in 1991 (Swimmer et al. 1992).

Funding for section 6 grants has been meager and irregular. The Reagan administration failed to request any section 6 appropriations in 5 of 7 budget years. Although Congress did appropriate Section 6 funds in those years the uncertainty of the appropriations severely weakened the program. Species recovery is a long term process. Facing uncertain appropriations many states were reluctant to enter into long term projects which were likely to be prematurely terminated (Ernst 1991).

The increases in funding shown in Table 2-2 do not accurately portray the situation. Appropriations in 1987 are approximately equal to those of 1977, however the number of cooperative agreements with states increased four fold during those ten years. This resulted in a decrease in available funds per agreement from \$200,000 to \$57,000.

Fiscal Year	Dollars (thousands)
1982	0
1983	2,000
1984	2,000
1985	3,920
1986	4,204
1987	4,300
1988	4,300
1989	5,000
1990	5,676

Source: Ernst (1991, p. 104).

Despite inadequate funding of section 6 agreements, individual states have significantly increased their role in endangered species

protection. States collectively provide protection to a wider array of species than the federal ESA. State programs are also better able to extend protection to locally or regionally declining species that do not warrant federal listing. State programs also generally have shorter listing times than the backlogged federal agencies (Griffin and French 1993). The ability of state programs to serve as a "first line of defense" could result in conservation of species with less restrictive and less expensive measures.

**Review of State Programs** (ESA § 6(d)). The Secretary is required to review all actions under section 6 "at no greater than annual intervals." The legislative history indicates that Congress intended this to provide the Secretary with "authority ... to intervene at any time if the circumstances were so changed as to render it imperative in his judgment that the cooperative agreement be terminated or that a new agreement be negotiated."

**The "Floor" of Federal Protection** (ESA § 6(f)). The third final sentence in section 6(f) states:

Any State law or regulation respecting the taking of an endangered species or threatened species may be more restrictive than the exemptions or permits provided for in this Act or in any regulation which implements this Act but not less restrictive than the prohibitions so defined. (ESA § 6(f)).

The final sentence is clear: "State law ... [on] taking [listed] species ... may be more restrictive ... but not less restrictive than" the "exemptions or permits provided in this Act" (ESA § 6(f)). As such, it is only a restatement of a recurrent theme: the ESA was to provide a federal "floor" on the protection of listed species. Throughout the legislative process leading up the adoption of the Act—in the hearings, the committee reports, and the floor debates—the participants repeatedly stated that state law could not be less stringent than federal:

[T]he states are to be free to develop regulatory mechanisms which are more stringent or restrictive than those of the federal government... The only exception to this is contained in the language which expressly

prohibits the state from voiding actions specifically permitted by Federal agencies or from permitting specific actions forbidden by Federal agencies. *In all other regards, the state law is not preempted, but is merely subject to the Federal "floor" of regulations under the Act.* (H.R. Rep. No. 412, 93d Cong., 1st Sess. 14 (1973).

While the last sentence in section 6(f) is in itself relatively clear, other sections of the Act can be read to cloud this clarity. Subsections 6(g), for example, provides that the Act's taking prohibitions do not apply within a state that "is then a party to a cooperative agreement with the Secretary ... except to the extent that the taking of any such species is contrary to the law of such State."

**Transition from Federal to State Primacy** (ESA § 6(g)). The third subsection of section 6 that speaks to the federal/state relationship is subsection 6(g). As the subsection's title states, it instituted a period—the "establishment period"—during which states would be able to adopt conservation programs and negotiate cooperative agreements under section 6(c). The section specified the relationship between federal and state law during the establishment period that expired not later than March 28, 1975.

Although the establishment period has long since expired, section 6(g) has continuing relevance because it provides:

The prohibition set forth in or authorized pursuant to sections 4(d) [authorized the promulgation of protective regulations for threatened species] and 9(a)(1)(B) [prohibiting the taking of an endangered species] of this Act shall not apply with respect to the taking of any resident endangered species or threatened species (other than species listed in Appendix 1 to the Convention or otherwise specifically covered by any treaty or Federal law) within a State ... which is then a party to a cooperative agreement with the Secretary pursuant to subsection 6 of this section (except to the extent that the taking of any such species is contrary to the law of such State). (ESA § 6(g)).

The primacy of state law in such cases is reiterated in the specific sections—sections 4(d) and 9(a)(1)(B)—that prohibit the taking of listed species.

When section 6(c) was amended in 1977 to

encourage increased state participation by reducing the requirements for cooperative agreements, Congress also indirectly amended section 6(g) by providing that state law governs takings only when the state has negotiated a "full coverage" cooperative agreement. States may negotiate full coverage agreements by adopting a conservation program that "is in accordance with" the Act and fulfills all five criteria listed in section 6(c). States that are unwilling or unable to meet these requirements may still negotiate "limited coverage" cooperative agreements if they satisfy a less-demanding set of criteria. The most important difference between "full-coverage" and "limited coverage" agreements is their comprehensiveness: a full coverage agreement requires the state to develop conservation plans for *all* species that are listed by the Secretary; a limited coverage agreement requires the state to develop programs only for those species "most urgently in need of conservation programs."

**ESA Taking: The Muddled Interaction of Federal-law-as-floor and State-primacy Provisions.** The ESA's provisions on section 9 takings contain two general propositions. On the one hand, federal law is a floor. Section 6(f) states, "Any State law ... [on] taking [listed] species ... may be more restrictive ... but not less restrictive than" the Act. On the other hand, state law on takings is to be applied in states that have full-coverage cooperative agreements. According to section 6(g),

The prohibitions set forth in or authorized pursuant to section 4(d) [authorizing regulations restricting takings of threatened species] and 9(a)(1)(B) [prohibiting takings of endangered species] ... shall not apply with respect to the taking of any resident [listed] species ... within any State ... which is then a party to a cooperative agreement with the Secretary ... except to the extent that the taking of any such species is contrary to the law of such State. (ESA §6(g)).

There is a potential interpretational problem lurking in the interaction of these provisions. As Coggins (1974) noted some twenty years ago, the "[i]nterpretational difficulty with the question of which entity regulates taking in

what circumstances and under what requirements is nearly insuperable."

The interaction of the state-primacy and federal-law-as-floor provisions are subject to at least four differing interpretations, but not all interpretations have equal support in the Act's language, structure, and legislative history.

The first interpretation (the "simple") emphasizes the clear statement that federal law preempts less but not more restrictive state takings law. It also is consistent with the recurrent refrain in the legislative history that the Act provided a floor on the protection of listed species. While it slights the state-primacy language, this reading has been adopted by the courts which have explicitly faced the question because it more clearly reflects the Act's fundamental objective: the conservation of species facing extinction.

The second and third readings (the "straight forward" and the "complex") both seek to give effect to both the state-primacy and federal-law-as-floor provisions. The straight forward view is that the two provisions address different questions: the state-primacy provisions in section 4(d), 6(g), and 9(a)(1) answer the question, what is the source of the law? The federal-law-as-floor provision in section 6(f) answers the question, what is the content of the law? While this reading of the state-primacy language does limit the "except to the extent that" phrase, its construction of the various provisions seems less artificial than that offered by the timber industry attorneys in the third alternative interpretation. The complex construction effectively reads the federal-law-as-floor provisions out of the Act when a state has entered into a full-coverage cooperative agreement—despite the valiant effort by Quarles et al. (1993) to develop a construction that avoids this result. While neither of these interpretations is without its awkward points, the first construction is more internally coherent and consistent with the legislative history and statutory objectives.

The final reading (the "punt") shifts the focus of the debate by interpreting sections 6(c) as entrusting the Secretary with the discretion to decide what takings prohibitions are "in accordance with" the Act. Under this approach, it is for the Secretary in the first instance to decide what state programs qualify

for cooperative agreements. If the Secretary approves a full-coverage agreement, the takings prohibitions contained in that agreement apply within the state. This alternative also transforms the legal issue from (a) what does the statute provide? to (b) was the Secretary's interpretation of the statute arbitrary, capricious, or an abuse of discretion?

There is no conclusive answer to the conundrum. The statutory language, legislative history, and canons of statutory construction do not definitively resolve the issues.

Ultimately, however, there is something to be said for continuity. The Act has consistently been construed by the Departments of the Interior and Commerce and the judiciary in ways that are only consistent with giving section 6(f) dominance. Consider, for example, the Minnesota wolf litigation. Secretary of the Interior James Watt sought to authorize a sport trapping season on wolves in Minnesota. The courts rejected the Department's argument that the Secretary had the discretion to authorize trapping because the wolves were threatened rather than endangered. None of the parties construed the Act as though state law was determinative of the issue. The example can be easily expanded. Furthermore, Congress has at least presumptively been aware of this interpretation; its failure either formally or informally to indicate disapproval of the universal construction despite numerous amendments to the Act lends additional support.

While none of these interpretations rises to the formal level of binding precedent, they do evidence a pattern of consistent interpretation. A settled pattern of action among all of the parties should not be lightly upset. The simplest solution seems preferable. As one district court has noted, "the clear language of § 6(f) of the ESA combined with the overwhelming priority Congress has given to the preservation of threatened and endangered species warrant the conclusion that the ESA's takings prohibitions are a minimum." (Professor Goble's contribution ends here.)

## ESA and Indian Nations

Because Indian nations are considered sovereign governmental units, their rights must be addressed as the ESA is implemented by them and other governmental agencies on tribal and non-tribal lands. In 1994, the Bureau of Indian Affairs in the Department of the Interior, with input from Indian tribes, developed eight principles which were to be incorporated into the Indian Fish and Wildlife Policy being developed by the FWS. The eight principles addressed are: (1) tribal sovereignty and jurisdiction; (2) the government to government relationships and consultation; (3) Indian self-determination, self sufficiency, and self governance policies; (4) trust and rights protection responsibilities; (5) the unique character and special status of Indian lands as "private trust assets"; (6) the unique character of Indian fish, wildlife, and natural resources; (7) the status of tribes as resource co-managers; and (8) the "reasonable and necessary" and "clear intent" principle (Deer 1994).

One point in the principles is that Indian treaty obligations in fish and wildlife—including areas off-reservation—are considered a property right subject to protection by the Fifth Amendment of the United States Constitution (see Question 9 for an explanation). The principles also state that "all federal agencies share responsibility when implementing laws benefiting or affecting Indian resources" (Deer 1994).

In short, the principles reaffirm that Indian nations are independent governmental units and need to be consulted about actions that affect their lands and the fish and wildlife species that inhabit those lands. In addition, the principles recognize that Indians traditionally have a special relationship with many fish and wildlife species either for ceremony, subsistence, or commerce. Certain species must continue to be available so that traditions may continue. This may involve protection of species both on and off tribal lands. In some cases, Indians may have different rights to species than other Americans. The principles also say that the burden of "species preservation" should not fall disproportionately on Indian nations (Deer 1994).

The draft Fish and Wildlife Policy for Indian Nations (Deer 1994) is official operating policy (G. Rankel, pers. comm.). The policy makes no specific mention of the ESA, other than what is digested in this section.

In August, 1995, the FWS and NMFS announced a new joint policy designed to enhance the role of Native American Tribal governments in the endangered species program. The policy seeks to involve Native American Tribal governments throughout the U.S. in every aspect of the endangered species program from providing information about which species should be protected to more active management of recovering species on or near Tribal lands.

The new joint policy calls for both agencies to:

- Consult with and use the expertise of Native American Tribal governments when determining which species should be listed, conducting surveys on species populations, and implementing conservation measures.

- Provide notification to, use the expertise of, and solicit information from Tribal governments when preparing proposed and final rules to list species; consider impacts to reserved hunting and fishing rights and trust lands and exercise species regulatory authority for threatened species when reserved hunting and fishing rights are involved.

- Allow tribal governments to participate in all phases of consultation about potential conflicts with endangered or threatened species.

- Use the expertise of Tribal governments in habitat conservation planning.

- Include tribal governments in all public aspects of recovery planning processes and implementation including design and implementation of monitoring programs for delisted species (US-FWS 1995f).

## Conclusions

The U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS; collectively, both agencies are the "Service") had their respective responsibilities under the ESA determined in 1970, three years before the ESA was enacted. Tobin (1990) observed that this division of responsibility has not worked smoothly. According to Tuttle

(review comments), this is not the case in Idaho, "where both Services have a memorandum of understanding and where both Services have always reached agreement on how to protect listed species."

The ESA gives the Service authority to write implementing regulations. Species protection is provided by allowing the Service discretion to determine what constitutes "jeopardy" and what a taking of a species is.

The recovery of species is the overriding goal of the ESA.

The role of the states in species conservation is subordinate to the federal role. Mechanisms for cooperative agreements provide modest funding for states. The ESA gives the Service the responsibility for species conservation, and cooperation is to take place through grants and cooperative research programs (J.M. Scott, review comments).

### Question 3. Where is ESA information available?

Decisions on species conservation can be improved with improved information. The goal of attaining better and more reliable data for listing and recovery planning decisions is beyond question. Who should collect the data, how they should do it, how it should be analyzed and presented, and how much the additional information costs are all choices to be faced along the way. If you are a land manager planning to undertake activities that might impact an endangered species you should be aware of the sources of information available to you.

#### Federal Agency Roles

Both the FWS and NMFS have field offices in Boise. In addition, the FWS has a field office in Spokane, Washington.

The FWS and NMFS depend on information for their decisions about species conservation. The Services are required to make listing determinations "solely on the basis of the best scientific and commercial data available." (ESA § 4(b)(1)(A)). Rule-making procedures during the listing and critical habitat designation processes require public notice be given in the *Federal Register*. Landowners and land-users can learn what the Service is up to early in the listing process, which is the most effective time to provide public comment.

The FWS periodically publishes the *Endangered Species Technical Bulletin*, designed to inform the public about species conservation programs. It is a useful source of information, but not a substitute for *Federal Register* notices because of timeliness. In recent years, publication of the *ESTB* has been sporadic, which the FWS attributes to lack of available resources.

#### National Biological Service

One of the practical problems in attaining the goal of the ESA to recover species is the lack of adequate data on the species themselves. In September 1993, Secretary of the Interior Bruce Babbitt created the National Biological

Survey by reassigning approximately 1,600 scientists to it from the FWS, BLM, and National Park Service. In January 1995, the agency's name was changed to the National Biological Service (NBS).

In Secretarial Order No. 3185 that renamed the agency, Secretary Babbitt clarified the mission of the NBS:

NBS is an independent bureau devoted to providing quality biological science. The mission of NBS is to work with others to provide scientific understanding and technologies needed to support the sound management and conservation of our Nation's biological resources. The primary role of the NBS is to meet the biological needs of other organizations within the Department of Interior, other Federal agencies, States, local entities, Tribes, and private and nonprofit users. (USDI 1995b).

**Challenges for NBS.** Jay Zigler, a spokesman for Secretary Babbitt, said the whole purpose of the NBS is to identify the nation's biological resources so steps can be taken to avoid the social and economic "train wrecks" caused by the ESA (Garber 1993h). Secretary Babbitt optimistically told a joint hearing of two House subcommittees that adequate research now will lead to better planning and more effective handling of problems in the future. He said, "I hope that in 10 years the ESA is forgotten. By that I mean there will be so little controversy that there will be no endangered species anywhere" (Cuscela 1993).

In a memo to his staff, Secretary Babbitt said, "By separating the science from resource management, we can elevate the credibility of science itself, forcing others to make decisions based not on ideology but on science" (Kenworthy 1993).

In 1993, Secretary Babbitt created the NBS through a Secretarial Order, without the approval of Congress. According to Harlow (1993), models for the NBS are the U.S. Geological Survey, the National Weather Service, and the Center for Disease Control. When the agency was first created in 1993, both the lack of congressional approval and the organizational structure led to some criticism.

Max Peterson, executive vice president of the International Association of Fish and Wildlife Agencies, raised concerns about the NBS during congressional testimony. "We



continue to question whether the administration has fully assessed the impacts or fully anticipated the gravity and ramifications of the proposed NBS," he said. "In the rush to do something new, less disruptive and lower cost alternatives may not have been given the kind of scrutiny they deserve" (Cuscela 1993).

Peterson is a former chief of the U.S. Forest Service. The USFS manages the world's largest forestry research organization, with a mission separate from its land and resource management mission. Forest Service Research sometimes works on resource management problems, and sometimes it doesn't. The NBS, according to Secretary Babbitt, will not work on agency missions. Babbitt said, "Let the science come first, keep it separate from regulatory, mission, and policy functions, and we'll have the cornerstone for more responsible natural resources public policy" (Harlow 1993).

The president of the Wildlife Management Institute, Rollin D. Sparrowe, was a senior official with the FWS, and shares Peterson's concern that the NBS will sever links between research scientists and resource managers and disrupt existing relationships with state fish and game agencies and universities (Kenworthy 1993).

This also troubles Jim Little, chairman of the National Cattlemen's Association endangered species and wildlife committee. The NBS will, according to Little, take funds away from practical, cost-effective, field-tested, and applied research (Cuscela 1993).

Since 1993, some of these criticisms have been muted because Secretarial Order No. 3185 clarified the mission of the agency and specifically addressed the relationship of the NBS to states and other organizations (UDSI 1995b). The order also addressed another concern of many people by specifically stating that neither NBS employees nor NBS volunteers could work on private property without the owner's permission.

Despite these changes, the NBS continues to experience problems in Congress. Early in 1995 some members of Congress suggested that NBS be dissolved and the scientists returned to their former agencies within the Department of the Interior. As of this writing, the plan is to merge the NBS into the U.S.

Geological Survey and reduce its budget.

To support the goal of species conservation, reliable information is necessary. Otherwise, ESA listing and recovery planning will remain highly uncertain and therefore controversial exercises. In 1995, the NBS released *Our Living Resources: A Report to the Nation on the Distribution, Abundance, and Health of U.S. Plants, Animals, and Ecosystems* (LaRoe et al. 1995). This was to be the first in a biennial series, compiled from existing data, to document to the extent possible the status of plants, animals, and ecosystems in the United States (Harlow 1993, NCASI 1994). The NBS may or may not continue to exist as a source of information about imperiled species.

### State Agency Roles

Many information functions are performed by state agencies. For example, the University of Michigan's School of Natural Resources publishes the periodical *Endangered Species UPDATE*. It contains useful articles on, among other things, species conservation programs and applied conservation biology concepts. The university has combined forces with the FWS, and publishes the *Endangered Species Technical Bulletin* packaged together with *Endangered Species UPDATE*.

One recent article in *Endangered Species UPDATE* featured Idaho's nongame and endangered species programs (Melquist 1993b). The article provided a list of more than a dozen brochures and pamphlets, several involving endangered species, available from the Idaho Department of Fish and Game's Information and Education section.

A landowner concerned about possible endangered species should contact not only the FWS, but also the Idaho Department of Fish and Game headquarters in Boise. The Department's Nongame Program is responsible for endangered species programs. The Idaho Conservation Data Center (CDC) is part of the Department's Natural Resources Policy Bureau and can provide information about specific areas and specific species. The publication "Rare, Threatened, and Endangered Plants and Animals of Idaho" (CDC 1994) is revised every two years and contains updated state and federal conservation status designations for all

rare species in the state.

### Interest Groups

An interest group may be defined as an organization of individuals sharing one or more interests who try to influence decisions of government agencies, political representatives, or other policymakers (Montsma 1969). To the extent that an interest group is organized for the purpose of disseminating information about imperiled wildlife, such a group may be useful as a source of information.

The three principal types of interest groups active on natural resource issues are 1) citizen groups, often called environmental groups or citizen conservation groups; 2) trade associations, comprised of companies or firms concerned with the impact of government on their business, the promotion of their products, and the image of their industry; and 3) professional associations and research groups (Cabbage et al. 1993). A brief discussion of each follows.

1) *Citizen Conservation Groups*.—In Idaho, there are several groups organized to promote conservation of various wildlife species. The Wolf Education and Research Center in Ketchum is organized to promote wolf conservation through research and education. The group has organized events to locate wolves, and publishes a newsletter. Their most ambitious effort is a wolf holding facility large enough for the pack of animals.

Several groups focus on salmon recovery. The Northwest Resource Information Center in Eagle is a frequently cited source of information on salmon. Save Our Wild Salmon, based in Boise, also can provide information.

2) *Trade Associations*.—The Idaho Farm Bureau has paid for the collection of information about the distribution and abundance of imperiled snails, and used that information in an attempt to support efforts to keep such species from being listed.

Individual forest products companies can be sources of information about particular species. Potlatch Corp. in Lewiston and Boise Cascade Corp. in Boise both have Ph.D. wildlife biologists on staff to assist the

companies with integrating wildlife habitat considerations into corporate land management plans. The Intermountain Forest Industry Association, based in Coeur d'Alene, also employs a wildlife biologist.

3) *Professional Associations and Research Groups*.—In assembling its inventory of rare and imperiled fish, wildlife and plants, the Idaho Conservation Data Center relies heavily on the Idaho chapters of The Wildlife Society and the American Fisheries Society, as well as the Idaho Native Plant Society. These professional and scientific interest groups are sources of considerable expertise.

### A "Central Clearinghouse" Design?

The Idaho Conservation Data Center housed in the Idaho Department of Fish and Game (IDFG) (see Question 2) functions as a central clearing house for information on the distribution of imperiled species. The IDFG Nongame and Endangered Program of the IDFG has state responsibilities for involvement in endangered species programs, as per section 6 of the ESA. Although other agencies have responsibilities for ESA-related functions, the IDFG is the only choice for a central clearing house. The IDFG already performs this function, and section 6 of the ESA identifies the state fish and wildlife as the agency responsible for whatever coordination is to be done, as well as entering into cooperative agreements with the federal agencies for species conservation purposes.

### Land Manager's Checklist for Avoiding Potential ESA Problems

The ESA raises several questions of interest to non-federal landowners. What ESA protection mechanisms am I required to follow and what are the penalties if I don't? How can I avoid "harm" to protected species? How can I avoid problems with the ESA?

**Protection and Penalties.** The ESA mandates three classes of prohibitions to protect species: no person may trade them, take them, or adversely modify their critical habitat. Plants get less protection than animals. In addition, federal agencies are prohibited from

"jeopardizing" protected species, which includes issuing permits for private activities.

Trade means engage in commerce, transport, or sale of protected species or their parts. Lawful permits may be granted.

Take is defined in the ESA to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect." Service regulations further define "harm" to include "significant habitat modification or degradation where it actually kills or injures wildlife by impairing essential behavior patterns, including breeding, feeding or sheltering." Thus all habitat for listed species (critical or otherwise) is subject to protection by the Service. Critical habitat designation is analytically demanding and can lead to land-use conflicts, causing Service biologists to prefer making judgments about "jeopardy" and "harm" rather than designate and protect critical habitat.

Endangered plants, like animals, are protected from commerce, transport, and sale. Unlike animals, destruction of protected plants is not a prohibited take on federal land unless done intentionally. However, removing and possessing protected plants from federal land is prohibited. Plants on non-federal lands are not protected by the ESA, but are subject to state statutes, such as trespass and special protection laws. Idaho has no such special laws concerning plant protection.

Federal agencies are prohibited from actions "jeopardizing" species, which the Service equates with "harm." All federal employees must consult with the Service about potential "jeopardy" if planned activities are likely to affect listed species, including activities on non-federal lands if federal leases, permits, or funds are involved. Federal timber sales have usually been through consultation before being publicly offered.

Courts may enjoin activities following citizen suits alleging "harm" or taking if there is proof of the likelihood of future violations of the Act. Civil penalties of \$25,000 per violation can be assessed. Criminal penalties can be fines of up to \$50,000 and imprisonment for one year. Violators can lose federal permits as well as guns, cars, and other equipment used in the crime. Enforcement of illegal "taking" is infrequent, averaging 25 cases annually, or 3% of all ESA

adjudications, the rest being trade violations. If the purpose was avoiding bodily harm, and not protecting property, killing can be exempted from penalties.

***Avoiding "Harm" and Taking.*** Violation of the Endangered Species Act may be prosecuted as a criminal activity. Individuals may be prosecuted for trading in endangered species without a permit or for taking an endangered species or "significant habitat modifications" on public or private land.

If take is incidental to, and not the purpose of, planned activities, it is possible to apply for an "incidental take" permit, which requires developing a Habitat Conservation Plan which is subject to the Service's approval. For some threatened species, including the northern spotted owl, the Service can write "special rules" concerning take that may allow some activities to occur without "harm" to the species.

The scope of "harm" and take is broad. A precedent-setting enforcement action occurred in 1992. Three civilian employees of the U.S. Army responsible for forestry and associated environmental impacts were indicted in January 1992 by a federal grand jury. They were charged with conspiracy to violate the ESA by allegedly allowing timber harvests that harmed the red-cockaded woodpecker (RCW) population on the Fort Benning military reservation in Georgia. The indictment alleged that the defendants concealed the known presence of RCW colonies and nesting-cavity trees and submitted false documents and maps thereby permitting cavity trees to be destroyed and RCW colonies to be left without sufficient habitat. The indictment alleged this resulted in a take of the RCW by disturbing natural behavior patterns, including breeding, feeding, and sheltering, such that RCWs were injured and died (Rolston 1992).

The FWS brought the charges in the RCW case against the three defendants, who were required to bear their own defense costs. The threat of a lawsuit by citizen conservation groups over alleged RCW mismanagement by the federal government at Fort Benning spurred the litigation. The case has potential for similar enforcement of takings cases on private land, and for future criminal

prosecution of forestry and wildlife management prescriptions, investigation about damage to RCW populations, and application of the ESA. The trial was scheduled for the fall of 1992 (Cubbage et al. 1993). Prior to trial, the case was settled out of court. Two of the defendants paid fines of \$1500 and were placed on one year probation.

A second such suit has been brought against Anderson & Middleton, Inc. a small logging company that wanted to harvest 72 acres of timber on its own land on Washington's Olympic Peninsula. The government's case is that because a pair of northern spotted owls lives 1.5 miles away, the timber cannot be harvested. This case is currently pending. It will not only test what "actual injury" to a species is but also put the science of spotted owl protection on trial (Macleod 1995), if the case goes to court (see further details under Question 9).

**Avoiding ESA Problems.** Are your activities planned on land harboring listed species? The nearest U.S. Fish and Wildlife Service office and the Natural Heritage Program (or Conservation Data Center as it is called in Idaho) connected with your state fish and wildlife agency can help answer that question, and also identify species proposed for listing. Candidate species under consideration for possible future listings have almost no ESA protection, but are worth checking on. Voluntary conservation agreements may exist to keep candidates off the list, and could affect your public relations as well as land management considerations. In Idaho, there are 18 listed species and roughly 135 candidate species, of which three dozen currently have special management strategies at various stages of development to keep them from being listed. If imperiled species may be present, a field survey by competent biologists to determine their presence/absence is necessary to avoid potential problems.

If there is a listed species present, you must determine if connections between the proposed activity and the federal government exist. Such a "nexus" could occur through federal permits, use of federal funds, or federal ownership or control of the land, including critical habitat designation. With a federal

nexus, some required ESA tasks become federal responsibilities that otherwise would fall on the landowner, including the preparation of environmental analysis required under NEPA to obtain an "incidental take" permit (US-FWS 1994c).

Planned activities that might take listed species (or "jeopardize" them if there is a federal nexus) sometimes can be mitigated by moving the project, using alternative methods, or changing the timing of the project. As simple examples, if a protected animal requires wetland habitat, you could design the project to protect a marsh rather than fill it. If a protected bird may be adversely affected by clearcuts but unaffected by selective cutting methods, then you could choose the latter method to avoid ESA scrutiny. In grizzly bear country, harvesting timber during winter hibernation may be a simple and effective mitigation strategy. Mitigation may also be more complicated, involving such things as land trades and special funds to pay for mitigation activities.

**Problem Identification Checklist.** An endangered species program on industrial timberland in the South identified four components as necessary for success: inventory, management planning, training, and monitoring (McGlincy and Haines 1994). The following checklist from the *Endangered Species Handbook* (Vaughan 1994) suggests things to consider during inventory and management planning:

- \_\_\_ Are activities in or near designated critical habitat?
- \_\_\_ Are activities in actual habitat for listed (or candidate) species?
- \_\_\_ Do local environmental groups (e.g., The Nature Conservancy) know of listed or candidate species in the area?
- \_\_\_ Conduct a competent biological survey to verify presence/absence of the species.
- \_\_\_ Are alternative sites possible?
- \_\_\_ Are alternative methods feasible?
- \_\_\_ Can timing be altered?
- \_\_\_ Has another operator in the area experienced ESA problems?

**Actions to Avoid Problems.** If the inventory reveals listed species, it may be significant whether that species is classified as threatened or endangered. The Service has some flexibility to write section 4(d) "special rules" for the taking of threatened species, alleviating some concerns for owners. Otherwise landowners should at least consider an "incidental take" permit. With a federal nexus, it can be obtained through consultation with the Service (ESA § 7). Otherwise a Habitat Conservation Plan is necessary (ESA § 10).

The following points from the *Endangered Species Handbook* (Vaughan 1994) summarize actions potentially helpful in avoiding ESA problems:

- **Anticipate** potential problems by acquiring knowledge of ESA requirements and possible species and habitat considerations in your area of operations,
  - **Inform** the Service of planned activities,
  - **Cooperate** with the Service and interested parties,
  - **Share** information about possible impacts,
  - **Employ** unbiased professional experts,
  - **Incorporate** suggestions from experts,
  - **Explore** reasonable and prudent options,
  - **Be honest** about the project and limits to its economic viability,
- **Litigate** only if the Service has made an unscientific decision (courts will give benefit of the doubt to the Service) or if species protection results in a "taking" of property (courts have not yet found ESA protection to be a property "taking"),
  - **Petition** for statutory exemption from the ESA, available from the Endangered Species Committee ("God Squad"), available only if there is a federal nexus (there have been three such cases), and
  - **Lobby** Congress and the President to legislatively exempt the project from ESA requirements if statutory exemption is not possible and litigation is unsuccessful (this has happened three times).

### Conclusions

Information is a key element in the protection of imperiled species conservation. Almost all land-use decisions have the potential to be affected by the requirements of the ESA. It is best to have information before taking action rather than afterwards, so getting good, accurate information up front is the best practice. The FWS, NMFS, NBS, and IDFG can all provide information. Interest groups also can provide information, but users should be aware that the information may reflect the group's values and objectives.

**Question 4. What species are on the ESA list and protected in Idaho?**

Idaho has 18 species listed as threatened (6) or endangered (12) including 3 mammals, 3 birds, 4 fishes, 6 snails, and 2 plants (Table 4-1). As of March 1, 1995 there were 961 federally listed threatened and endangered species in the United States (Table 4-2).

**Mammals**

**Gray Wolf.**—The gray wolf is the largest wild dog, standing up to 32 inches at the shoulder, measuring up to 76 inches in length and weighing up to 115 pounds (Melquist et al. 1993). Gray wolves are highly social animals and when established in an area, live in packs that range in size from two to 25 or more animals (Mech 1970). Packs cooperatively hunt, kill, and eat a variety of big game including deer, elk, and moose and to a lesser extent small mammals and birds. Wolves also kill cattle and sheep, but predation rates are less than one percent of the livestock within primary wolf habitat in Minnesota, British Columbia, and Alberta (Fritts 1990). There are no confirmed accounts of healthy wild wolves attacking humans in North America (Mech 1990).

The gray wolf all but disappeared from the American west by the 1930s because of large-scale poisonings and other predator control measures. Although hundreds of likely sightings of gray wolves have occurred in Idaho in the past several decades, no pack activity, a precursor to reproduction, has been documented (Wise et al. 1991). Gray wolves were listed as endangered in 1973. Additional information on gray wolves can be found in Policy Analysis Group Report No. 4 (Wise et al. 1991).

**Woodland Caribou.**—The woodland caribou is known as the "bigfoot of the north" because of its broad, concave hooves that keep it from sinking in the snow (Melquist et al. 1993). Woodland caribou stand about four feet tall at the shoulder. Males can weigh up to 400 pounds; females can weigh up to 250 pounds. Both sexes have antlers. Dominant males maintain and breed harems of three to 10 females. Woodland caribou do not migrate

widely to find food, but prefer to move higher and lower in elevation instead (Melquist et al. 1993).

Idaho's woodland caribou population is now restricted to northern Idaho in the Selkirk mountains. Idaho's woodland caribou are part of a population isolated by Kootenay Lake, to the north in Canada, and human developments elsewhere (Melquist et al. 1993). Hunting and habitat loss to fires and logging reduced the population, and woodland caribou were listed under emergency provisions of the ESA as endangered in 1983 and formally listed in 1984. There is some controversy as to whether Idaho's caribou were a resident population or a migratory portion of the Selkirk herd that moves south from Canada periodically.

**Grizzly Bear.**—The grizzly bear gets its name from its grizzled appearance caused by the long, silver-tipped guard hairs that stand above its coat that can range from blonde to almost black. Adult males weigh up to 600 pounds; females weigh up to 350 pounds.

Grizzly bears require large areas of habitat. Mothers with young use approximately 100 square miles, whereas males can roam an area as large as 300 square miles (Melquist et al. 1993). Grizzly bears are omnivores, eating many types of food including grasses, roots, berries, insects, carrion, elk calves, and fish.

Because they were considered a threat to human life and livestock, grizzly bears were almost wiped out in the lower 48 states by the 1930s. Habitat loss and human-related mortality combined with the bears' low productive rate have kept their populations small. They were listed as threatened in 1975. Analysis of the reasons for grizzly bear listing in four separate Idaho populations—Selkirk, Cabinet-Yaak, Selway-Bitterroot, and Yellowstone—is provided in Policy Analysis Group Report No. 12 (MacCracken et al. 1994).

**Birds**

**Whooping Crane.**—Whooping cranes are an international symbol of endangered wildlife. The whooping crane is the tallest bird in North America, standing up to five feet tall. Adults mate for life, usually producing one offspring

Table 4-1. Species listed under the federal Endangered Species Act in Idaho, September 30, 1995.		
	ENDANGERED	THREATENED
Mammals	2 Gray wolf Woodland caribou	1 Grizzly bear
Birds	2 Whooping crane American peregrine falcon	1 Bald Eagle
Fishes	2 Kootenai River white sturgeon Snake River sockeye salmon	2 Snake River chinook salmon (spring/summer & fall runs)
Snails	5 Utah valvata snail Idaho spring snail Snake River physa snail Banbury springs limpet Bruneau hot springs snail	1 Bliss Rapids snail
Plants	1 MacFarlane's four-o'clock	1 Water howellia
TOTAL	12	6

per year. Most whooping cranes winter in Texas and breed in Canada.

Whooping cranes were never common, but they were almost wiped out in the late 1800s because they were hunted for their plumage. By 1941, only 16 birds remained. A captive breeding program was begun in 1967. The whooping crane was listed as endangered in 1970 under a law predating the ESA.

**American Peregrine Falcon.**—The peregrine falcon has a sleek, compact body with long, pointed wings that are well suited to aerial hunting for other birds. Peregrines cruise at 40 to 60 mph and can dive as far as 1,500 feet to hit their prey in mid-air at speeds of up to 150 mph (Melquist et al. 1993). Peregrines nest from Alaska and Canada to Mexico. Females lay two to four eggs, and both parents incubate them.

Peregrine falcons were nearly wiped out in the United States by the mid-1970s because of the widespread use of the insecticide DDT. Chemical residues accumulated in the insects

on which it was used. In turn, the residues were passed on up the food chain by other animals that fed on insects. Because peregrines are meat eaters at the top of their food chain, the residues from DDT accumulated in their bodies. The residues caused peregrines' eggshells to be thinner than normal, leading many eggs to crack during incubation.

The peregrine falcon was listed as endangered in 1970 under a law that predated the ESA. By the mid-1970s no peregrines were known to nest in Idaho.

**Bald Eagle.**—The bald eagle, our national symbol, is found only in North America. This large raptor with a white head and tail has a 6 to 7 foot wing span. Bald eagles usually hunt from tree perches and eat fish and waterfowl. Bald eagles mate for life, and pairs return year-after-year to the nest they establish, usually in the canopy of a large, living tree. Both adults incubate the two or three eggs that the female lays each spring.

Table 4-2. ESA listed species by category, March 1, 1995.

	United States Species				Foreign Species (T&E)
	Endangered	Threatened	With Recovery Plans*	% With Recovery Plans	
Mammals	55	9	40	62%	274
Birds	76	16	70	76%	183
Reptiles	14	19	30	91%	79
Amphibians	7	5	11	92%	8
Fishes	68	37	66	63%	11
Snails	15	7	11	50%	1
Clams	51	6	42	74%	2
Crustaceans	14	3	4	24%	0
Insects	20	9	20	69%	4
Arachnids	5	0	4	80%	0
ANIMAL SUBTOTAL	325	111	298	68%	562
Flowering plants	406	89	201	n.a.	1
Conifers	2	0	1	n.a.	2
Ferns and others	26	2	4	n.a.	0
PLANTS SUBTOTAL	434	91	206	39%	3
GRAND TOTAL	759	202	504*	52%	565

\* There are 445 approved recovery plans. Some recovery plans cover more than one species, and a few species have separate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

n.a. = not available in source document

Source: US-FWS (1995b) "Box Score."

Trappers, collectors, and bounty hunters contributed to the decline of the bald eagle, but the main reason for their decline was the use of DDT. Like the peregrine falcon, DDT residues passed up through the food chain thinned the shells of eagle eggs. Bald eagles were listed as endangered in 1967. In August 1995, the bald eagle was downlisted from endangered to threatened status in all of the

lower 48 states (60 Fed. Reg. 36000 [12 July 1995]).

#### Fishes

*Snake River Sockeye Salmon, Snake River Chinook Salmon (Spring/Summer and Fall Runs).*—These fish species are addressed in the salmon case study in Appendix B. The



Snake River sockeye salmon was listed as endangered in Idaho in 1991, and the spring/summer and fall runs of the Snake River chinook salmon were listed as threatened in Idaho in 1992, then changed to endangered in 1994 under an emergency rule. That rule expired in May 1995 so the runs technically have reverted to their threatened classification.

**Kootenai River White Sturgeon.**—The white sturgeon is a primitive fish that evolved 400 million years ago and has cartilage instead of a bony skeleton. The fish uses its vacuum cleaner type mouth to suck up living and dead organisms. Female white sturgeon mature later than males, generally at 15 to 32 years. Both sexes may live to be 70 years old. Females deposit 100,000 to 7 million eggs in rocks above rapids every four to 11 years.

In Idaho, populations of white sturgeon are found in both the Snake and Kootenai river drainages, but the populations are genetically distinct. The Kootenai River white sturgeon are substantially smaller, weighing less than 200 pounds. The Kootenai population has been isolated since the last ice age 10,000 years ago, and confined to 168 miles of river between Kootenai Falls in Montana and Kootenay Lake in British Columbia.

The Kootenai River white sturgeon population has not reproduced successfully since 1974, probably because of changes to river flows after Libby Dam was built in the 1970s. Loss of nutrients, diking, and water pollution also may be factors. The Kootenai River white sturgeon was listed as endangered in 1994.

### Snails

**Utah Valvata Snail, Idaho Springs Snail, Snake River Physa Snail, Banbury Springs Limpet, and Bliss Rapids Snail.**—Most Idaho snails are living fossils, a reminder of the ancient lakes that once covered parts of Idaho. The Bliss Rapids snail and Idaho springs snail are survivors of late Pliocene Lake Idaho, which covered much of southern Idaho. The Snake River physa snail is a relic from Pleistocene waters. The Utah valvata snail survives only in the Snake River, a fraction of its former range in Pliocene-Pleistocene times. The Banbury Springs limpet, a newly

discovered species, has not yet been traced to its fossil roots.

These animals are all about the size of President Abraham Lincoln's head on a penny, and survive only in the Middle Snake River and a few tributaries and springs between Hammett and the Fort Hall Reservation. They live primarily on or under rocks, and feed on diatoms or powdery plant debris.

These snails depend on high water quality, and will die without clean, well-oxygenated water. Due to habitat loss, all of these species were listed as endangered in 1992, except the Bliss Rapids snail which was listed as threatened.

**Bruneau Hot Springs Snail.**—The Bruneau hot springs snail—about the size of President Franklin D. Roosevelt's ear on a dime—lives only in thermal springs that range between 72 and 96 degrees Fahrenheit in the vicinity of a tributary of the Bruneau River in southwestern Idaho. It was listed as endangered in 1993, but the listing was challenged in court, and the snail was delisted because of procedural errors. However, it was relisted as endangered in June 1995 after the district court's decision was overturned by the 9th Circuit. A case study of the Bruneau hot springs snail as an example of ESA flexibility is under Question 12.

### Plants

**MacFarlane's Four-O'clock.**—MacFarlane's four-o'clock is a perennial with a deep taproot and rose-purple flowers, each about an inch square. The plant lives in the Hells Canyon area of the Snake River and several canyons along the Salmon River. The plant's preferred habitat seems to be in canyons where the climate is warm and dry. Because the *Mirabilis* genus generally is restricted to the Southwest, the species is unique to the Pacific Northwest. Botanists believe MacFarlane's four-o'clock expanded its range northward in previous times when the climate was warmer. As the climate cooled, only isolated populations of the plant remained in west-central Idaho and adjacent Oregon, where growing seasons are long and the winters are mild. Even in the 1930s, when MacFarlane's four o'clock was discovered, the plant was not

abundant.

MacFarlane's four-o'clock was thought to be extinct from 1947 to 1977 when a small population was discovered in Hells Canyon. In addition to climate limitations, the plant is threatened by livestock trampling, collection by humans, competition with exotic weeds, insect damage, and disease. It was listed as endangered in 1979. MacFarlane's four-o'clock was proposed for downlisting to threatened in 1993, but as of this writing no final rule has been published in the *Federal Register*.

**Water *Howellia*.**—As its name indicates, the water howellia is dependent on moist habitat. It is an annual, aquatic plant with submerged or floating stems and small white flowers. In order for its seeds to germinate, they must be exposed to air. For this reason, the plant is found only in seasonal wetlands that become at

least partially dry by the end of the growing season. There appears to be no genetic variation within or between populations of this species (US-FWS 1993b).

Historically, the water howellia occurred in Montana, Idaho, Washington, Oregon, and California. The plant has been eliminated altogether from California and Oregon. The 79 remaining colonies are clustered primarily in two population centers, one in northwestern Montana and the other in eastern Washington. In Idaho, it survives at only one known site on the Palouse River floodplain near Harvard, Idaho.

The species is threatened by loss of wetland habitat and habitat changes due to timber harvesting, livestock grazing, residential development and competition by introduced plant species. The water howellia was list as threatened in November 1994.

**Question 5. What actions are underway to protect and recover listed Idaho species?**

Once a species is listed, a recovery plan must be developed so that eventually the species can be delisted. This section provides an overview of each species' recovery plan as well as a brief assessment of how the recovery plan affects current resource management and land-use practices in Idaho.

When a species is listed under the ESA, its needs come before any other resource management or land-use activity. The FWS and NMFS have the responsibility and authority under the Act to determine what the listed species need to survive and recover, and how current practices must be changed to assure the species is neither "jeopardized" by federal activities nor "harmed" by anyone.

**Mammals**

**Gray Wolf.**—The 1987 Northern Rocky Mountain Wolf Recovery Plan said that populations of at least 10 breeding pairs of gray wolves must be established in three recovery areas—central Idaho, Yellowstone National Park, and northwestern Montana—before the gray wolf can be considered recovered and delisted (Wise et al. 1991). The 1987 plan emphasized recovery through natural dispersal from existing populations in Canada, except in Yellowstone where reintroduction was recommended. In 1991, the U.S. Congress directed the FWS to prepare an EIS on wolf reintroduction in Yellowstone National Park and central Idaho.

Reintroduction of wolves is controversial for two main reasons. First, many ranchers oppose reintroduction because wolves prey on livestock, although rates of livestock predation are less than one percent (Fritts 1990). Second, some biologists and environmental groups oppose reintroduction because wolves appear to be moving southward from Canada on their own. Without reintroduction, the northwestern Montana population now exceeds 70 wolves. There have been increased wolf sightings in Idaho (Loftus 1994e), and some people believe there is pack activity (Associated Press 1994d).

The reintroduction plan is also controversial

because of the lack of state involvement in the process (Wickline 1995b). States were given ample opportunity to participate (W. Melquist, review comments), but Idaho law allows no funds to be spent on the wolf and only minimal cooperation by state wildlife officials in development of reintroduction plans (*Idaho Code* § 36-715). Some U.S. Congressmen from the region also have attempted to stop reintroduction by threatening to halt federal funding (Associated Press 1995d).

Despite the controversy, the Environmental Impact Statement for wolf reintroduction was approved in June 1994, a record of decision was issued in July 1994, and experimental population rules were issued in November 1994. In January 1995, fifteen wolves were translocated from Canada to the wilderness area of central Idaho in an attempt to establish a viable wolf population in Idaho. Fourteen wolves were translocated to Yellowstone and released in March 1995. The central Idaho wolves dispersed widely. One of the central Idaho wolves was killed after it was found feeding on a dead calf, but a necropsy showed that the calf was dead before the wolf found it (Foster 1995). However, controversy still surrounds the FWS's handling of the case (Greene 1995).

Although it is too early to judge the success of the translocation program in Idaho, changes in land-use activities will be minimal because much of the recovery area is wilderness. There is virtually no impact on land uses other than grazing in the wilderness area recovery zone (Wise et al. 1991). The status of translocated wolves is "experimental non-essential" (ESA § 10(j)) which means that wolves can be shot by ranchers if they prey upon livestock. This status is being challenged by a National Audubon Society lawsuit in Idaho federal district court (M. Feldman, review comments), with the Sierra Club Legal Defense Fund arguing the plaintiff's case.

**Woodland Caribou.**—Between 1987 and 1990, the Idaho Department of Fish and Game, in conjunction with other state, federal, and Canadian agencies, translocated 60 woodland caribou from Canada to northern Idaho to boost the Idaho population. Monitoring surveys continue (Melquist et al. 1993), and there are now only 13 caribou in

Idaho (Keating 1995c). The migration of caribou back to Canada has reduced the Idaho population. Predation by cougars and other animals, illegal killings, and legal killings of animals that wander back to Canada where they are not fully protected have accounted for numerous deaths.

The Biodiversity Legal Foundation is suing the FWS for not declaring critical habitat for the woodland caribou (Lee 1995, Titone 1993d). The U.S. Forest Service, which manages most of the woodland caribou's habitat, is revising its management guidelines (Lee 1995). In the winter, caribou depend on lichens that grow in mature forests, so timber harvest is affected to some degree. The national forests will maintain a percentage of their acreage in old-growth conditions, which should benefit caribou, but controversy exists over what types of timber management are appropriate for caribou on other forest lands. Clearcutting may increase summer forage, but it also attracts more deer which in turn may attract more cougars. However, some logging practices also promote lichen growth. Some biologists believe forests where caribou live should be left undisturbed because not enough is known about caribou ecology (Lee 1995). Snowmobiles have been banned from certain caribou wintering areas, causing some local recreationists to complain (Keating 1995c).

**Grizzly Bear.**—Four Idaho areas have designated grizzly bear recovery zones: the Selkirk Ecosystem, the Cabinet/Yaak Ecosystem, the Bitterroot Ecosystem, and the Yellowstone Ecosystem. An in-depth look at management and recovery efforts in each of these areas is provided in Policy Analysis Group Report No. 12 (MacCracken et al. 1994), but an update on the recovery situation since the report was published in November 1994 is warranted.

Grizzly bear recovery efforts in Idaho pose more changes to land-use activities than do wolves or caribou. Human-caused mortality is a prominent cause of endangerment, and road closure is the principal tactic used to keep people away from grizzly bears. This means recreation users can pick berries or hunt in places where they have in the past, but access will not be as easy. The impacts of grizzly bear recovery efforts on timber harvesting in

national forests are difficult to separate from other land-use changes to protect elk habitat and water quality, but the presence of grizzly bears usually changes land-use activities (MacCracken et al. 1994).

In North Idaho, where the Selkirk and Cabinet/Yaak areas are located, cooperation in planning for recovery appears to be taking place, at least for one Bear Management Unit (BMU). The U.S. Forest Service's proposed plan for the Kalispell-Granite BMU called for the closure of 125 miles of road, among other actions. The Intermountain Forest Industry Association (IFIA), a forest products trade association, hired a wildlife biologist to develop an alternative plan that used seasonal rather than permanent road closures, and featured more education and enforcement (Keating 1995a). In May 1995, the U.S. Forest Service released its final plan for the BMU, and won praise from both the IFIA and the Selkirk-Priest Basin Association, a local environmental group (Keating 1995b). The plan calls for some road closures and restrictions during the times when bears are active and an extensive education and enforcement campaign. Ken Kohli, IFIA spokesman, said that he hopes the effort becomes a model for how communities, industry, and environmentalists can work together within the ESA (Keating 1995b).

Discussions about the reintroduction of grizzly bears to the Bitterroot area of central Idaho are continuing. Much controversy surrounds the exact boundaries of where the bears will be protected and the status of the population once they are reintroduced (see MacCracken et al. 1994), but some cooperation appears to be happening here, too. A coalition of industry and environmental groups, including the IFIA and the National Wildlife Federation, have proposed a plan that calls for the reintroduction of bears and a 13-member board to oversee the recovery effort (Titone 1995b). The FWS is reviewing the proposal as part of an effort to develop an Environmental Impact Statement on grizzly bear recovery in the ecosystem. Public hearings about grizzly bear reintroduction in the Bitterroot Ecosystem were held in July 1995 in central Idaho and west-central Montana.

The recovery actions that are taking place in the Yellowstone Ecosystem are well documented by MacCracken et al (1994), and the population is close to the recovery goal and delisting is a possibility. The controversial grizzly bear recovery plan (US-FWS 1993a) is featured in **Appendix D**.

## Birds

**Whooping Crane.**—In 1975, an experimental cross-fostering program for whooping cranes was begun in Idaho in an attempt to establish a wild flock. The only other wild flock in the world winters in Texas and summers in Canada. Fertile whooping crane eggs from Canadian nests were put in sandhill crane nests at Grays Lake National Wildlife Refuge, east of Idaho Falls, in hopes that the whooping cranes raised by the sandhills would mate with their own kind (May and Henry 1995).

The effort cost more than two million dollars (May and Henry 1995) and failed because the whooping cranes did not mate with their own kind (Melquist et al. 1993). In one instance, a male whooping crane mated with a sandhill crane to produce a hybrid offspring; all were removed from the wild (W. Melquist, review comments). Barker (1993) suggested that the primary reason for failure was drought and water management. The Bureau of Indian Affairs controls flows from Grays Lake National Wildlife Refuge for downstream irrigated agriculture. When the water in the marsh drops, crane nests, eggs, and young are vulnerable to coyotes and foxes. Mortality was particularly high during the 1980s drought (Barker 1993).

Egg transplants ceased in 1988, but whooping crane survivors continue to migrate with Grays Lake sandhills to Bosque del Apache National Wildlife Refuge in New Mexico (Melquist et al. 1993). The northern Rockies flock peaked at 37 birds in 1985, and dropped to 13 in 1990.

**American Peregrine Falcon.**—Since 1982, the Idaho Department of Fish and Game has cooperated with other agencies as well as the private Peregrine Fund, Inc. to release 203 falcons at 16 sites throughout the state. The result has been an increase from one nesting pair in 1985 to 14 pair in 1993. The recovery

goal in Idaho is 17 nesting pairs (Melquist et al. 1993).

The recovery of the peregrine falcon is a success story because of public and private efforts. In 1970, before the ESA and the banning of DDT, Dr. Tom Cade, an ornithologist at Cornell University, began investigating the possibilities for captive breeding of falcons. He set up the Peregrine Fund, Inc., a private foundation, to help fund his work. In 1974, Cade and his associates began experimenting with returning falcons to the wild. They developed a technique called hacking that helped return juvenile birds to the wild. Human-raised peregrines began naturally reproducing in the wild in 1980. The Peregrine Fund, along with cooperating agencies and conservation groups, have been responsible for the release of more than 3,900 peregrines in North America.

Peregrines can readily adapt to a variety of habitat conditions, so long as there are adequate nesting conditions and prey. They now successfully live in wilderness areas as well as on skyscrapers in large cities and in a variety of habitats in between. Peregrine falcons pose little or no problem for current land-use activities because of the variety of habitats they can tolerate.

**Bald Eagle.**—The first statewide bald eagle nesting survey conducted in 1979 showed 9 productive pairs and 11 active pairs. In 1994, there were 76 occupied bald eagle territories with 57 pairs successfully providing 85 young (W. Melquist, review comments). Idaho's original goal was 30 nesting pairs. The recovery plan for the seven Pacific states (including Idaho) sets a recovery goal of 800 occupied nesting territories (IDFG 1992) and the FWS position is that it is inappropriate under the 1986 recovery plan to designate a goal for Idaho separate from the regional goal (K. Steenhof, pers. comm.).

One of the major reasons for the successful trend in bald eagle recovery was the banning of the pesticide DDT in 1972. Habitat protection has also been relatively easy to achieve because most needed changes in development plans have been minor (Barker 1993).

Bald eagles require adequate consideration of their riparian habitat needs where they

perch and especially when they roost. This may require wider buffer strip protection zones along rivers and lakes than might otherwise be the case. Bald eagles live around Cascade Reservoir, where water levels could be an important consideration in eagle management. This has some potential for conflict because adjustments to water levels that may be needed for protected salmon species recovery could adversely affect eagle habitat.

## Fishes

**Snake River Sockeye Salmon, Snake River Chinook Salmon (Spring/Summer and Fall Runs).**—The recovery of the three runs of Snake River salmon pose special land and water use considerations and changes. These are analyzed in the salmon case study in **Appendix B.**

**Kootenai River White Sturgeon.**—Because the Kootenai River white sturgeon was listed only recently, the recovery plan is still being developed. However, several of the agencies that are responsible for sturgeon habitat began trying to increase sturgeon populations several years ago before the species was listed, and recovery efforts continue today in the absence of an official recovery plan.

The harvest of Kootenai River white sturgeon was halted in 1984, after biologists realized that few juvenile fish born after 1974 existed. Three hypotheses were developed as to why the fish were not successfully reproducing: 1) agricultural or mining effluent was contaminating sturgeon eggs or fry, 2) eliminating backwater sloughs and building dikes to provide more cropland had destroyed important juvenile sturgeon habitat, and 3) the Libby Dam, completed in 1972, had drastically altered river flows and inhibited spawning and juvenile survival (Apperson 1992).

Studies were conducted of contaminant levels in Kootenai River sturgeon and compared with successfully reproducing populations of white sturgeon elsewhere. Contamination was found not to be a major inhibitor to reproduction or juvenile survival. Studies are continuing of hatchery-raised juvenile sturgeon to see if elimination of backwater habitat is a major cause for the lack of survival (Apperson 1992). Neither of the

first two hypotheses seem to be the principal cause of endangerment, but each will be addressed in the recovery plan (Associated Press 1994e).

River flow, or the lack of flow, appears to be the largest cause of unsuccessful reproduction. Under a natural flow regime, the river would flow most heavily in spring as snowmelt and spring rains run off the land. The sturgeon would spawn during these high flows. Under the conditions that exist with Libby Dam, water is held back behind the dam until late summer and winter. Recreationists use the water for boating on Lake Kootenai throughout the summer, and then the water is released in late summer and winter, and the Bonneville Power Administration generates power with it.

In the spring of 1991, naturally high river conditions and planned water releases by the U.S. Army Corps of Engineers resulted in river flows three times higher than average. Some natural spawning occurred; a dozen fertilized eggs were collected by the Idaho Department of Fish and Game (Apperson 1992).

In 1992, an interagency group—including the U.S. Army Corps of Engineers, the Bonneville Power Administration, and the Idaho Department of Fish and Game—was formed in an attempt to develop a plan for increasing spring releases from Libby dam in order to help stimulate sturgeon spawning. The group disbanded in 1993, unable to reach an agreement on a flow regime that might mitigate the problem and remove the need to list the Kootenai River white sturgeon (Titone 1993e).

In the spring of 1993, the Corps released water at 20,000 cubic feet per second (cfs) for two weeks in an effort to increase spawning. Biologists had called for flows of 35,000 cfs for six weeks. This modified flow regime cost the Bonneville Power Administration \$3 million in lost revenue; two fertilized white sturgeon eggs were found (Associated Press 1993f). The Kootenai River white sturgeon was listed as endangered in 1994.

In the spring of 1995, the Corps again released water at 20,000 cfs, but this time for a six-week period (Titone 1995c). Whether or not this will induce spawning remains to be

seen.

In 1991, the Kootenai Tribe of Idaho received funding from the Bonneville Power Administration to establish a white sturgeon hatchery at Bonners Ferry. That year the hatchery produced 2,000 fish that were restocked into the Kootenai River in 1992 (Apperson 1992).

The main effect of increasing river flows on current land-use practices is increased flooding of farmland adjacent to the Kootenai River during spring (Titone 1995c). Increased wear on levees and increased power bills to pump water out of fields also can result.

### Snails

*Utah Valvata Snail, Idaho Springs Snail, Snake River Physa Snail, Banbury Springs Limpet, and Bliss Rapids Snail.*—The listed snail species all inhabit areas along the middle reach of the Snake River between Milner Dam and King Hill. This 40-mile section of river includes the Hagerman Valley and Thousand Springs area, where most of the snails seem to be and where the production of roughly 70% of commercial trout raised in the United States takes place. Barker (1993) reported that a proposed additional aquaculture activity and hydropower dams precipitated the listing of these snails. Irrigated agriculture is the major land use in the area. These activities create aquatic conditions that do not favor the snails, which require cool, clean, free-flowing water. This is especially a problem in drought years.

The draft recovery plan calls for some modifications in current activities to accommodate the needs of the snails (US-FWS 1994b). Many of the changes involve improving surface water quality from agriculture in the area and are addressed in the Agricultural Pollution Allocation Plan developed to meet requirements of the Clean Water Act. Water quantity, both surface and sub-surface, needs to be augmented, and this will mean changes in both irrigation in the area and dam operation for hydropower.

According to Chuck Lobdell of the FWS, moving large quantities of water down the Snake River to help flush endangered salmon smolts to the ocean could create problems for the protected snails (Associated Press 1993e,

Barker 1993). This conflict will need to be addressed in a coordinated or multi-species recovery plan. No mention of potential conflict is made in the draft plan for snails, but possible flow augmentation for salmon is mentioned (US-FWS 1994b).

*Bruneau Hot Springs Snail.*—The Bruneau Hot Springs snail is addressed as a case study under Question 11.

### Plants

*MacFarlane's Four-O'clock.*—After the discovery of an existing population of MacFarlane's four-o'clock in 1977 and its listing in 1979, more intensive searches began for the plant. Within four years, six colonies were known to exist. Now, at least 18 colonies on approximately 150 acres have been found. About 6,300 plants exist in Idaho and 2,300 in Oregon (58 *Fed. Reg.* 45085 [26 August 1993]). The recovery plan calls for at least 10 colonies of the plant, five within each of the two populations, Idaho and Oregon. The MacFarlane's four-o'clock is doing well enough that it was proposed for downlisting to threatened in August 1993. As of this writing, no final rule regarding the downlisting has been published in the *Federal Register*.

Besides more intensive searches that have located additional colonies of MacFarlane's four-o'clock, the pressures causing endangerment are being removed or modified. Both the U.S. Forest Service and the Bureau of Land Management have adjusted grazing practices in areas known to contain colonies of the plant. Some grazing allotments are abandoned earlier in the year than they would be otherwise. Some colonies of the plant have been fenced to protect them. Private landowners with colonies of MacFarlane's four-o'clock on their land have been cooperative in recovery efforts (58 *Fed. Reg.* 45085 [26 August 1993]).

Collection of the plant by amateur botanists and unsuspecting people is another big problem facing the MacFarlane's four-o'clock. Other impediments to recovery include climate limitations, recreational activities and competition with exotic plants.

*Water Howellia.*—The water howellia was listed in late 1994, so no recovery plan has yet

been adopted. Because the water howellia has very narrow ecological requirements, it is vulnerable to even subtle environmental changes. Activities that affect the amount or quality of water in the species' habitat, or have impacts on the pond basins, are the most direct threats. Such factors include timber harvesting, commercial and residential development, grazing, and encroachment of wetlands by invading grasses (US-FWS 1993b).

Both on-going and historical impacts to water howellia's distinctive wetland habitats appear to be threatening the species. According to Moseley (pers. comm.), the water howellia may be an indicator of the

decline of vernal pool communities. Because the pools draw down during summer, they are easily filled, and he believes many vernal pools in the Palouse River Valley, and elsewhere in Idaho, have been destroyed since settlement. Other threats include encroachment of wetlands by invasive grasses, timber harvesting, and grazing (Harms 1993). Each of the factors causing endangerment will be addressed in the recovery plan, and land management activities will have to be adjusted in order to protect the species. The plant exists in only one Idaho location near Harvard, and recovery might involve identifying additional areas where the plant can recolonize.



**Question 6. What are the prospects for recovering and delisting Idaho species?**

Recovery of listed species takes adequate habitat, time, the skills and talents of biologists, and cooperation from federal and state land management agencies and the private sector (R. Howard, review comments). It may have taken many decades to reduce some species to the point where they were listed, and it likely will take at least that long to recover them (J.M. Scott, review comments). The Idaho experience to date is that the private sector has given generously towards species recovery cooperative efforts in Idaho by complying with state and federal statutes, becoming partners for long-term solutions, direct donations, and hiring biologists to help integrate opportunities for not only listed but also candidate species on private lands (R. Howard, review comments).

Are any of Idaho's listed species likely candidates for delisting? Although there is much guesswork in assessing the potential for delisting, it appears that two species will have a possibility for delisting in the not too distant future—the bald eagle and peregrine falcon. A third, the Bruneau hot springs snail, is also a possibility in the near future. This section briefly reviews the outlook for each of the 18 listed species. Conservation efforts and effects on current land-use activities were addressed in the reply to Question 5 in the preceding chapter.

**Mammals**

**Gray Wolf.**—The gray wolf may be recovered in Idaho at some time in the future, depending on the success of recovery efforts now focused on translocating Canadian wolves to the central Idaho wilderness areas. Delisting also depends on efforts in Montana and Wyoming as well (Wise et al. 1991). The 1987 recovery plan calls for recovery and delisting by the year 2002, with a minimum of 10 breeding pairs, or roughly 100-150 wolves, in each of the three locations.

**Woodland Caribou.**—Efforts to recover the endangered woodland caribou in Idaho have not met with much success, so the prospects for delisting as a result of successful recovery

are not good. The Selkirk Mountains population, which Idaho is part of, has stabilized at around 50 animals (*Spokesman-Review* 1995b), with about 13 of them in Idaho (Keating 1995c). This is short of the intermediate recovery plan goal of 100, which also calls for establishing at least one other population outside the Selkirks to support occasional interbreeding (IDFG 1992).

**Grizzly Bear.**—The revised grizzly bear recovery plan is featured in **Appendix D**. It requires that two conditions be met before a population can be delisted: 1) the achievement of population goals set for that ecosystem, and 2) approval of an interagency conservation strategy that will assure that the necessary regulatory mechanisms are in place to guarantee a sustained recovery (US-FWS 1993a).

The Selkirk and Cabinet/Yaak Ecosystems in northern Idaho currently support small populations of grizzlies, but their numbers do not seem to be increasing toward recovery goals. The primary reason is human-caused mortality. Recovery and delisting seem a remote possibility at this point; however, these populations are southern extremities of much larger areas in Canada, so there is some hope that more grizzlies may move south on their own. However, there is no evidence that Canadian grizzlies will guarantee the long-term survival of neighboring U.S. populations (Mattson et al. 1995). Another possibility is that once connections are made to the Yellowstone ecosystem to the south through the Bitterroot Ecosystem, some grizzlies may migrate northward and increase numbers in north Idaho. Melquist (review comments) believes this to be extremely unlikely because grizzly bears are poor pioneers and dispersers to new areas. The reintroduction and recovery efforts for the Bitterroot Ecosystem are just beginning, and a plan has not yet been developed.

In December 1994, the Interagency Grizzly Bear Committee unanimously recommended that the grizzly population in the Yellowstone Ecosystem be delisted (Associated Press 1994f). At that time officials expected that the formal petition for delisting would be forthcoming in 1995, but at this writing it has not been filed. Some biologists do not believe

that a long-term viable population of grizzlies has been reached in the Yellowstone Ecosystem (Mattson et al. 1995).

In early October 1995, a U.S. District judge ruled that the FWS grizzly bear recovery plan was a violation of the ESA because it did not adequately consider habitat factors that could affect grizzly bear recovery in Yellowstone National Park (Associated Press, 1995*h*). The judge also ruled that the plan did not adequately address the habitat needs of the Selkirk population and that the FWS acted illegally when it refused to reclassify from threatened to endangered the threatened Cabinet/Yaak population. The FWS was given 90 days to reconsider portions of the plan that the judge found illegal.

### Birds

**Whooping Crane.**—Whooping cranes will not be recovered and delisted in Idaho anytime in the foreseeable future. The few birds that still summer at Gray's Lake National Wildlife Refuge are not breeding. The more likely scenario is that whooping cranes will be extirpated from Idaho, which might trigger delisting.

**American Peregrine Falcon.**—The peregrine falcon is a success story. The Arctic subspecies, previously listed as threatened, was delisted in November 1994. The endangered American subspecies is doing well in Idaho, and in June 1995, the FWS proposed delisting (60 *Fed. Reg.* 34405-34409 [30 June 1995], US-FWS 1995*e*). In both cases, one of the primary factors leading to recovery was the banning of the pesticide DDT in 1972, but other conservation efforts have been instrumental in the success story.

**Bald Eagle.**—The bald eagle is also an Idaho success story. On August 11, 1995 the bald eagle was reclassified from endangered to threatened in all of the lower 48 states (60 *Fed. Reg.* 36000 [12 July 1995]). (It had been downlisted in Washington and Oregon in 1986.) Nesting pairs increased from 12 in 1982 to 76 occupied territories in 1994 in Idaho, exceeding the original recovery goal of 30. The 1986 recovery plan set a seven-state regional goal that includes 800 nesting pairs, an average reproduction rate of at least 65%,

attainment of breeding population goals in 80% of 47 zones in the region, and no persistent decline in wintering habitat (K. Steenhof, pers. comm.) The security of many nesting territories and other habitat needs remains questionable (K. Steenhof, pers. comm.), and this is one reason why delisting has not been proposed. This illustrates a problem caused by focusing on population levels rather than habitat needs. Until the causes of endangerment are effectively mitigated—which in most cases will involve habitat—the requirements for delisting will not have been met. It is conceivable that a region-wide effort to provide habitat security—perhaps through a Conservation Agreement (see Question 8)—could result in delisting within five years (K. Steenhof, pers. comm.).

### Fishes

**Snake River Sockeye Salmon, Snake River Chinook Salmon (Spring/Summer and Fall Runs).**—The prospects for salmon recovery and delisting, based on the salmon case study in **Appendix B**, are not too optimistic. The complex life cycle and large range of these species make recovery a difficult and expensive proposition.

**Kootenai River White Sturgeon.**—Recovery plans for the Kootenai River white sturgeon currently are being developed. It is unknown when population levels will have recovered sufficiently for the species to be delisted, but the eggs found in spawning gravel in 1991 and 1993 following increased spring water flows are encouraging signs.

### Snails

**Utah Valvata Snail, Idaho Springs snail, Snake River Physa Snail, Banbury Springs Limpet, and Bliss Rapids Snail.**—Idaho's five listed Snake River snails have some potential for being delisted as the result of current litigation rather than from recovery efforts. At issue is the number of snails and the quality of scientific data. The Idaho Farm Bureau Federation, which filed the suit in 1993, hired a scientist to look for snails, and more were found than the data the FWS used to list the species would have indicated. The cause of

endangerment is hydroelectric development, pollution and drought in the Middle Snake River (LaMay 1993). The listing of the snails in December 1992 was completed in response to a lawsuit filed by two Idaho conservation groups in October 1992 (Associated Press 1992e). The dueling scientists had previously debated their data in public hearings (Stuebner 1991). Review by an independent scientist from the University of Idaho supported the FWS' recommendation to list the five species of Snake River snails (*Idaho Statesman* 1992a). The Farm Bureau filed another suit in October 1994, "claiming the government made procedural errors and improperly convened a technical advisory committee" (Associated Press 1994c). The legal issues have yet to be resolved.

The draft recovery plan for the Snake River snails does not provide specific recovery criteria for four of the five snails because more information is needed on existing populations and their habitats (US-FWS 1994b). For the Banbury Springs limpet, water quality and quantity must be permanently protected in the three known habitat sites. No date for recovery and delisting is specified in the plan.

**Bruneau Hot Springs Snail.**—The Bruneau Hot Springs snail is featured as a case study of ESA flexibility under Question 11. A cooperative agreement between ranchers and the FWS to provide water for the snail could move the species rapidly toward delisting.

## Plants

**MacFarlane's Four-O'clock.**—The MacFarlane's four-o'clock is doing well and was proposed for downlisting from endangered to threatened status in August 1993 (58 *Fed. Reg.* 45085-45091 [26 Aug. 1993]). No

further action has been taken, and no timetable for delisting exists.

**Water Howellia.**—The water howellia plant was listed in late 1994. The recovery plan currently is being written, so no estimate of the time of recovery and delisting can be made.

## Conclusions

The prospects for recovering and delisting species in Idaho is a mixture of good news and bad news. Idaho populations of gray wolves, peregrine falcons, bald eagles, MacFarlane's four-o'clock, and the Yellowstone Ecosystem portion of the grizzly bear population are increasing. Peregrine falcons have been proposed for delisting, bald eagles were recently downlisted, and MacFarlane's four-o'clock has been proposed for downlisting. The increase in gray wolf population is due to the recent reintroduction and it is too early to tell if long-term recovery can be achieved.

It's too early to tell about how recovery efforts for the listed salmon, sturgeon, snails, and water howellia are going. Grizzly bears in northern Idaho are not doing well, but they may be reintroduced into the Selway-Bitterroot area of central Idaho in the near future. The woodland caribou and the whooping crane are not faring well even with recovery efforts.

In the future, the best strategy for keeping plants and animals at viable population levels is to take action before they reach the point where listing under the ESA is necessary. Once the species gets on the list, it is likely to remain there, inviting federal oversight of land-use activities in Idaho to ensure adequate protection of threatened and endangered species and their habitat.

### Question 7. What species in Idaho are candidates for ESA listing?

Today's candidate for listing could become tomorrow's listed species. This chapter presents current information on approximately 135 species with a potential to be listed in Idaho, as recognized by federal and state agencies. (Underlining of *species* is not done in this chapter, but the reader should be aware that subspecies and distinct population segments are included in the definition of species.) The Conservation Data Center administered by the Idaho Department of Fish and Game maintains a list of these species and data about them (see CDC 1994). The CDC (1994) list includes those considered as candidate species by the FWS, which assigns each to one of three major categories along with a numerical priority and an indication of population trend. Nationwide, there are almost 3,800 species considered as candidates for listing by the FWS. In Idaho, there are 90 FWS candidate species. Their status is summarized in Table 7-1. Those in most imminent peril are identified in the next chapter. In addition, the BLM and USFS maintain sensitive species lists, and the IDFG maintains a "species of special concern" list; in total these add another 45 species to those the FWS considers as candidates for listing (see CDC 1994).

#### Federal Agencies

The FWS and the NMFS maintain lists of candidate species. The FWS has developed draft Endangered Species Program guidance for candidate species (US-FWS 1994a). These internal guidelines are meant to provide procedures for a program that effectively identifies species as candidates for listing, and describes potential conservation actions that may stabilize and recover these candidate species and reduce their priority for listing. Candidate species are those plant and animal species that, in the opinion of the Service, may qualify for listing as endangered or threatened.

**U.S. Fish and Wildlife Service Priority Categories.** Candidate species are classified into one of three categories. The FWS has

been gathering information on species that may require listing under the ESA since 1973. These species, identified as candidates, are first assigned to administrative categories depending upon the completeness of information regarding their status. Next, they are assigned numerical priorities when there is sufficient information to do so (48 *Fed. Reg.* 43098).

The FWS uses a **candidate assessment process** to develop a candidate list of species that may qualify for federal protection under the ESA. Candidate assessment involves gathering status information on existing candidate species as well as those that might qualify. Status information may include data on life history strategies, population trends, key habitats, and threats to the species. The determination of candidacy involves analyzing the current status of the species. This includes confirmed and likely threats as well as unique biological factors that may affect survival. The analysis uses existing as well as historic information on population size, density, and distribution, and the relationship to the five ESA factors for listing (see ESA § 4(a)(1)).

Neither the degree of rarity nor limited distribution of a species compels its acceptance as a candidate. Evidence of substantial decline in population numbers or habitats and curtailment of range are considered primary screening criteria as is vulnerability to known or potential threats (US-FWS 1994a).

Once information on the status of a species under consideration has been gathered, it is evaluated, often with the assistance of professional societies such as the Idaho Native Plant Society, the Wildlife Society and the American Fisheries Society. The information is then used to assign the species to one of three species candidacy categories (see Sidebar 7-1). Then the species is given a numerical priority assignment (see Table 7-2). Species do not have official candidate status until published in a comprehensive plant or animal notice of review or in a *Federal Register* notice (e.g., 59 *Fed. Reg.* 58982 [Nov. 1994]).

According to the FWS, the agency also directs efforts for conservation of species identified as candidates for listing under the ESA (US-FWS 1994a). These efforts are

Table 7-1. Number of species considered by the FWS as candidates for federal listing in the U.S. and Idaho.		
	U.S.	Idaho
Category 1 - animals*	57	2
1 - plants*	<u>238</u>	<u>12</u>
Total	295	14
Category 2 - animals*	1,800	33
2 - plants*	<u>1,697</u>	<u>43</u>
Total	3,497	76

\* See Sidebar 7-1 for definitions of Category 1 and Category 2.

Source: US-FWS (1994f),  
59 Fed.Reg. 58982-59028.

Table 7-2. Priorities for listing imperiled species under the ESA.			
Threat		Taxonomy	Priority*
Magnitude	Immediacy		
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies	6
Moderate to low	Imminent	Monotypic genus	7
		Species	8
		Subspecies	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies	12

\*In addition to the numeric priority, the Status Trend is assigned: Improving, Stable, Declining, Possibly Extinct, Unknown, Not Applicable.

meant to reduce the need to list species as endangered or threatened. Effective candidate conservation efforts should be aimed at candidate recovery, halting or reducing the decline of some species, and removing the threats to the species. Although less manageable threats may need to be addressed through listing, urgency for listing may be

reduced, or occasionally eliminated, by undertaking candidate conservation actions (US-FWS 1994a). This statement emphasizes the cooperative nature of efforts to keep species from being listed. The FWS clearly feels it is responsible for directing such efforts, thus state agencies must work closely with the FWS.

## Sidebar 7-1.

## Categories of federal candidate species for ESA listing.

CATEGORY 1 - Taxa for which the FWS has on file sufficient information on biological vulnerability and threats to support a proposal to list (C1)

CATEGORY 2 - Taxa for which the FWS has information indicating that proposing to list is possibly appropriate but for which conclusive data on biological vulnerability and threat currently are not available to support a proposal to list (C2).

CATEGORY 3 - No longer candidates for listing (C3):

3A - Taxa for which there is persuasive evidence of extinction.

3B - Names that, on the basis of current taxonomic understanding, do not represent distinct taxa meeting the ESA definition of species.

3C - Taxa that have proven to be more abundant or widespread than previously believed and/or that are not subject to any indefinable threat.

Source: US-FWS (1995a).

According to FWS candidate species program guidance "effective Candidate Conservation efforts allow priority for listing to be given to those species facing the greatest threats and likely to be in greatest need of the full range of the ESA's protective measures" (US-FWS 1994a, p. 2). By placing an emphasis on early conservation efforts for candidate species, all entities involved seek to stabilize and recover these species and their ecosystems before listing becomes a priority. It is FWS policy to use all authorities to develop and promote opportunities to conserve candidate species and the ecosystems that support them. In general, opportunities for conservation actions should be sought in cooperation with state and other federal agencies, Indian tribes, local governments, conservation organizations, private landowners, and others. They should measurably contribute to stabilizing or improving the status of candidate species (US-FWS 1994a).

**Candidate Species Assessment.** The listing of species as threatened or endangered in 1973, when the ESA was enacted, was a cumulative result of work by Service biologists and the Smithsonian Institution. Biologists in the 1960s produced a "red book" of animals believed to be endangered, and it was the focus of concern under the Endangered Species Protection Act of 1966 and the Endangered Species Conservation Act of 1969, the

precursors to the ESA of 1973. In 1975, the FWS accepted a report by the Smithsonian Institution identifying imperiled plant species. Most of these plant and animal species were listed in the initial FWS program, with the remainder forming a core of animal candidate species. Biologists from state agencies, professional societies, and private conservation organizations have continued to compile information to suggest additional species for possible listing.

The ESA provides authority to list any species or subspecies of plant or animal that satisfies the definition of endangered or threatened. Most candidate species are given a C1 or C2 classification (see Sidebar 7-1) rating and numerical priority (see Table 7-2).

As of May 1994, there were 295 animal and plant species in the United States in Category 1 and another 3,497 domestic species in Category 2 (Table 7-1). The FWS listed an annual average of 34 species from 1973 to 1991 (US-GAO 1992), including the 134 species that had been listed under the Endangered Species Protection Act and Endangered Species Conservation Act prior to 1973. This annual average jumped to 97 between the years 1992 and 1994 (see Figure S-1, page 3). The reason for the recent increase is a lawsuit and subsequent settlement, which is detailed in the **Litigation to List** section towards the end of this chapter. Most of the 322 new listings that occurred between September 1991 and September 1995 were

plants (255), invertebrates (41), or fishes (18). Only a few birds (7) and one mammal were net additions to the threatened and endangered lists during that four year period (Figure S-2, page 3). As of November 1994, candidate species in Idaho were 2 animal and 12 plant species in Category 1, and 33 animal and 43 plant species in Category 2 species (Table 7-1).

Upon the receipt of a petition to list a plant or animal, the FWS has 90 days to make an initial decision if the petition warrants a full status review. The final ruling on a listing decision is due one year after the petition is received. The decision of listing is one of warranted, not warranted, or warranted but that the "immediate purpose" is precluded by pending proposals for other species (Houck 1993).

**"Warranted but Precluded."**—A "warranted but precluded" designation was meant to be a short-term waiting area for plants and animals deserving protection, but prevented from listing under the ESA because of other more pressing matters. The bull trout case, covered in **Appendix C**, is an example of controversy this designation can lead to.

According to Houck (1993), a law professor, the congressional intent of the "warranted precluded" provision was to allow the Service to attend to species with greater priority needs, but regardless of what Congress intended, the "warranted but precluded" category has become a "black hole" for unlisted endangered species. Houck (1993) said that the FWS uses the category as an on-going "limbo" for species in order to make the ESA's mandatory requirements subject to agency discretion. In other words, said Houck, the FWS does not list species that qualify, preferring to keep them in candidate categories until petitions or lawsuits are filed by citizen groups to list the species. To the contrary, the liberal use of the "warranted but precluded" category by FWS may indicate that the budget Congress has given the FWS does not fit the size of the job it has been given.

Since the ESA was amended in 1982 to authorize use of the "warranted but precluded" designation, 114 species had been placed in this category for 2 or more years (Table 7-3). Of these, 19 were ultimately declared

endangered or threatened, whereas 16 were found not to warrant ESA protection. An additional 77 species are still awaiting FWS action (US-GAO 1992).

Table 7-3. Use of the "warranted but precluded" category, through fiscal year 1991.

Number of Years in the Warranted but Precluded Category	Number of Species
2	9
3	15
4	3
5	17
6	9
7	3
8	56
Unknown	2
Total	114

Source: US-GAO (1992).

The "warranted but precluded" category has delayed the listing of some candidate species. In 1990, The Nature Conservancy estimated that 165 unlisted species (30 vertebrates, 84 invertebrates and 51 plants) had become extinct while the FWS focused its attention on "higher priority" matters (US-FWS 1990).

When listing may have some economic impact or have political opposition, the FWS has a long record of bending the ESA's mandatory requirements to its discretion and has thus thwarted the listing process many times to appease economic and political interests (Vaughan 1994). Inadequate funding may make this strategy a practical necessity, and lack of funds has often been cited as a major reason for the slow implementation of listing under section 4 of the ESA. However, Scott (review comments) knows of no instances of using the political process to list a species when it was biologically indefensible to

do so.

**Candidate Species Protection and Emergency Listing.** Candidate species are afforded some statutory protection. In 1988, the ESA was amended to require that the status of petitioned candidates be monitored in order to ensure that they do not become extinct while awaiting listing (ESA § 4(b)(3)(c)(iii)). The Service is also required to exercise emergency listing authority (ESA § 4(b)(7)) to protect these species when an emergency situation poses a risk to the survival of the species (Houck 1993, citing ESA § 4(b)(3)(c); US-FWS 1994a). This has happened in at least four instances in 1989 and 1990, including the winter run of Sacramento River chinook salmon (Houck 1993).

According to Coggins and Glicksman (1995), protection for candidate species falls short of an enforceable legal rule. Under consultation procedures (ESA § 7(a)(4)), action agencies are to "confer" with the Service on the effects of actions on proposed species, but the conference is advisory only and the agency is under no duty to refrain from acting while the conference takes place. According to Houck (1993), the Service thus has some discretion to protect candidate species by emergency listing and by conferring. The use of this discretion may result from a lack of resources to recover the species after listing and political opposition to the listing.

**National Marine Fisheries Service.** The FWS policy for developing their candidate species list includes sources of potential candidates from inside the Service as well as outside sources including scientists, state agencies, professional societies and private conservation organizations. The NMFS candidate species list is entirely generated from within the agency. The NMFS most recent candidate species list indicates the agency has not identified any candidates for listing in Idaho (56 Fed. Reg. 28797). Because of the smaller number of species on the NMFS candidate species list, categories such as C1-C3 do not apply. The NMFS has also not made any "warranted but precluded" findings on any petitioned actions, nor has the agency had an opportunity to enter into any conservation

agreements for candidate species.

**U.S. Forest Service and Bureau of Land Management Sensitive Species.** The U.S. Forest Service (USFS) and USDI Bureau of Land Management (BLM) have developed "sensitive species" lists.

It is the policy of the BLM to conserve threatened and endangered species and the ecosystems upon which they depend (BLM Manual, Chapter 6840). It is BLM policy to manage candidate species and their habitats to insure that BLM actions do not contribute to the need to list any candidate species as threatened or endangered. The State Director has the authority to designate sensitive species, which are to be managed under the same policy as candidate species. It is also BLM policy to carry out management for the conservation of state-listed plants and animals by assisting the state in achieving management objectives for those species.

For the BLM, the definition of sensitive is as follows:

- Sensitive species are those designated by the State Director, usually in cooperation with the state agencies responsible for managing the species as sensitive. They are those species 1) that are under status review by the FWS; or 2) whose numbers are declining so rapidly that federal listing may become necessary; or 3) having typically small and widely dispersed populations; or 4) inhabiting ecological refugia or other specialized or unique habitats. (BLM Manual 6840).
- For Idaho, the Sensitive Plant Species List consists of those taxa known or suspected to occur on Bureau lands in Idaho that are: 1) listed as T/E under the ESA; 2) category 1 or 2 candidates for federal listing as T/E; or 3) listed by the Idaho Native Plant Society as priority 1, 2, or Sensitive for the state of Idaho. (CDC 1994).

As of 1988, the BLM had 14 fish, 11 mammals, 17 birds, 4 reptiles, 3 amphibians, and 3 invertebrates on their sensitive species list for Idaho. The BLM plant list, which was updated in 1994, has 89 sensitive species (CDC 1994). The list was updated in 1994, with input from members of professional societies, to be more consistent with U.S. Forest Service and Idaho Department of Fish



and Game lists (A. Thomas, review comments).

The USFS is directed by the Secretary of Agriculture's Policy on Fish and Wildlife to manage habitats of all existing plants and animals in order to maintain viable populations, as a minimum, and to avoid actions that may cause species to be federally listed (USDA regulation 9500-4). For sensitive species, the USFS is directed to develop and implement management practices to insure that these species do not become threatened or endangered.

Sensitive species are those plants and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by:

- significant current or predicted downward trends in population numbers or density, or
- significant current or predicted downward trends in habitat capacity that would reduce a species' existing distribution. (Forest Service Manual 2670).

There are three regions of the USFS that administer forests and recreation areas in Idaho: the Northern Region (R1) includes five national forests in northern Idaho, the Intermountain Region (R4) includes seven national forests in Idaho, and the Pacific Northwest Region (R6) administers the Idaho portion of Hells Canyon National Recreation Area. As of 1994, when most plant lists were updated, approximately 122 plant species were classified as sensitive in Idaho. As of 1990 (for R4) and 1991 (for R1), there were 12 fish, 1 amphibian, 1 reptile, 12 birds, and 7 mammals on the USFS sensitive species list for Idaho (CDC 1994).

### State Agencies

**Idaho Department of Fish and Game.** The IDFG is mandated to "preserve, protect, perpetuate, and manage" all wildlife (*Idaho Code* § 36-103). The IDFG has regulations that classify wildlife as game animals, birds, and fish; furbearing animals; migratory birds; threatened or endangered wildlife; protected nongame animals; unprotected wildlife species; and predatory species. The IDFG also maintains a list of "species of special concern," defined as follows:

1. Native species which are either low in numbers, limited in distribution, or have suffered significant habitat losses.
2. The list includes three categories:
  - A. species which meet one or more of the criteria above *and* for which Idaho presently contains or formerly constituted a significant portion of their range (i.e., priority species),
  - B. species which meet one or more of the criteria above *but* whose populations in Idaho are on the edge of a breeding range that falls largely outside the state (i.e., peripheral species), and
  - C. species that may be rare in the state but for which there is little information on their population status, distribution, and/or habitat requirements (i.e., undetermined status species). (Source: IDFG Nongame and Endangered Wildlife and Fisheries Management Plan, 1991-1995).

Currently, IDFG has 29 "priority" species (14 fish, 1 reptile, 2 amphibians, 9 birds, and 3 mammals); 16 "peripheral" species (3 reptiles, 4 birds, and 9 mammals); and 18 "undetermined" species (2 fish, 1 amphibian, 2 reptiles, 7 birds, and 6 mammals).

**Idaho Conservation Data Center.** In 1984, the Idaho Natural Heritage Program (now called the Conservation Data Center or CDC) was established under a cooperative agreement between The Nature Conservancy and the Idaho Department of Fish and Game. The CDC maintains a comprehensive computerized and manual data base on Idaho's rare, threatened, and endangered plants and animals. Support for the program comes from many private organizations and public agencies who have as a part of their goals the conservation of imperiled species and their habitats (Moseley 1992).

The CDC maintains lists of rare plants and animals in Idaho as they are classified by various state and federal agencies. Data maintained by the CDC includes various agency policies, regulations, and definitions of classification or designation systems, such as FWS Sensitive Species. The CDC also maintains a summarized list of rare species in Idaho with all of the agency designations that is updated every two years (see CDC 1994).

The CDC also classifies rare species by a

priorization system used by the Network of Natural Heritage Programs and Conservation Data Centers called the CDC rank (see Master 1991). The rank is based on the number of known occurrences, habitat quality, estimated number of individuals, narrowness of range or habitat, trends in populations and habitat, and threats. The CDC rank is meant to complement national and state rare species lists because these lists often include additional criteria, such as recovery potential, that go beyond assessing threats to extinction (CDC 1994).

The CDC is now the central repository for nearly all rare plant information in the state. Rare plants in Idaho are classified according to a Conservation Data Center rank and an Idaho Native Plant Society category (see CDC 1994). The six categories of plant classification in Idaho (see Moseley 1992) do not have the same legal protection as animals on the IDFG list (B. Moseley, review comments). The goal of the CDC is to maximize the use of these data in the conservation of biological diversity in Idaho (Moseley 1992).

**Idaho Department of Parks and Recreation.** Since 1967 the Idaho Department of Parks and Recreation has had the responsibility for protecting native wildflowers in Idaho (*Idaho Code* § 18-3913). IDPR has the legal authority to establish and amend a list of plants in need of protection because of their potential to become extinct. Of the 24 species listed in 1967, only 3 occur on the Conservation Data Center's rare plants list. These three are also on the USFS (R1) list of sensitive species.

### Litigation to List

In December 1992, the FWS settled a lawsuit with a number of environmental groups that had sued over the slow rate of listing candidate species (*The Fund for Animals, et al. v. Lujan*, Civ. No. 92-800 [D.D.C. 1992], see Glitzenstein 1993). The plaintiffs claim contended:

- that the FWS was unreasonably delaying the listing of species as endangered or threatened, in violation of the Endangered Species Act;
- that the defendants were unreasonably delaying the listing of species to FWS Category 1 and

Category 2 lists;

- that the defendants were stalling on petitions to list species as endangered or threatened by finding that the listing is "warranted" but "precluded by pending" listing proposals;
- that the defendants were unlawfully classifying species as "warranted but precluded" when they cannot demonstrate progress in carrying out their listing responsibilities; and
- that the FWS was not monitoring or conducting new reviews of these species that are labeled "warranted but precluded" in violation of the ESA. (Howe 1993).

The settlement agreement requires the FWS to expedite proposals for listing of species as threatened or endangered, with the full protection delineated in the ESA. The agreement encompasses current candidates listed in Categories 1 and 2 as well as any future candidates or petitioned species. It also establishes a time table for the listing of these species, and eliminates the "warranted but precluded" designation. However, the FWS will continue to use the same process for listing, which means that a valid threat to the species being proposed for listing must be shown, and public input will remain a consideration (Howe 1993). Regarding the statement by Howe that public input will remain a consideration, he was probably referring to the need for the Service to provide public notice of the proposed regulation in the *Federal Register* following a status review that listing the species is warranted (ESA § 4 (b)(5)(A)-(E), see Chapter 1 *Listing Process* and following sections).

The settlement (see Sidebar 7-2) is nationwide. Its two main provisions are: 1) adding at least 401 Category 1 candidate species to the endangered and threatened lists by the end of 1996, and 2) moving forward with the determination of status for 923 species and either propose them for listing, redesignate them as Category 1 and propose them for listing by the end of 1996, or find that listing them is not warranted. Of those 923 species, 112 have had status surveys done for them and been designated as "warranted but precluded" but have not yet been assigned to Category 1. The other 811 species have been designated as "warranted but precluded" but have not been classified as Category 1 and have not had

## Sidebar 7-2.

*The Fund for Animals v. Lujan* settlement agreement.

The settlement agreement states that:

1. By no later than Sept. 30, 1996, the Department of Interior, Fish and Wildlife Service will propose for listing all species on the Category 1 list as of Sept. 1, 1992, unless the FWS publishes a notice in the *Federal Register* explaining why a particular C-1 candidate no longer warrants listing and is being removed from the list.
2. If a new candidate species with a higher listing priority than an existing candidate is placed in Category 1 before the 1996 deadline, then the new candidate can be substituted for an existing candidate to meet the obligation under section 1, above. However, any substitution of a new candidate species will first replace any species removed from the list which no longer warrants listing before succeeding an existing, but lower priority, Category 1 species. The FWS will promptly notify the plaintiffs of any substitutions and their justification. A species may not be used as a substitute for an existing C-1 species unless the FWS issues a notice proposing the species for listing prior to the Sept. 30, 1996 deadline.
3. If, as a result of substitutions, any species on the Category 1 list has not been proposed for listing or removed from the list, these species will fall under the following timetable:
  - A. If 20 or fewer species remain on the C-1 list, the FWS shall, no later than Sept. 30, 1997, propose the listing of such species or publish a *Federal Register* notice explaining why such species do not warrant listing and are being removed from the C-1 Category.
  - B. If more than 20 such species remain on the C-1 list, the FWS shall, not later than Sept. 30, 1997, propose for listing or publish explanation notices announcing the removal from the list of at least 20 species; and by no later than Sept. 30, 1998, the FWS shall propose for listing or announce the removal of all species remaining on the original Category 1 list.
4. With respect to all species that were classified as "warranted but precluded", but are not subject to the above requirements (i.e., those species which the FWS has not yet designated C-1 and have no priority number) and have had a status survey completed during the 12 months prior to Sept. 1, 1992, the FWS shall by Oct. 13, 1993, either:
  - A. Propose the species for listing as threatened or endangered;
  - B. Place species in the C-1 category with a priority number;
  - C. Publish notice explaining any not warranted findings.
5. For all "warranted but precluded" species that aren't subject to the terms in 1-3 but have not had a status survey completed within the 12 months prior to Sept. 1, 1992, the FWS shall publish renewed petition findings in the *Federal Register* that are based on the best available information and either:
  - A. Find the petitioned actions to be warranted and propose the species for listing;
  - B. Place any species that continue under "warranted but precluded" status on the C-1 list with a priority number;
  - C. Publish and explain any "not warranted" findings.
6. All species designated warranted but precluded after Sept. 1, 1992, shall be placed on the C-1 list and be assigned a priority listing number. A notice will be placed in the *Federal Register* advising the public that subsequently, all species designated as "warranted but precluded" in response to listing petitions will be placed in the C-1 category with a priority number instead of on the C-2 list.
7. The FWS agrees to direct each region to use a multi-species, ecosystem approach to their listing responsibilities under the ESA.
8. The FWS will submit annual reports on their progress in complying with this agreement to the plaintiff's counsel starting Dec. 31, 1992, and through Dec. 31, 1997.

status surveys done for them (Howe 1993, Glitzenstein 1993).

The settlement agreement may illustrate that even though the available data on these species shows that they deserve protection under the ESA, the listing process has become bogged down and lost in a bureaucratic limbo of "warranted but precluded" (Vaughan 1994) as some species are annually recycled on a "warranted but precluded" merry-go-round (Kunick 1994).

In summary, under the terms the settlement agreement in *The Fund for Animals*, the FWS has until October 1996 to either list all C1 candidate species or to develop information as to why they do not need to be listed. That information may include conservation measures, taxonomic problems, and extinction possibilities.

#### **Listing Moratorium**

Perhaps in response to the intention of the FWS to speed up the listing of candidate species to settle *The Fund for Animals*

litigation, in April 1995 Congress passed a moratorium on any new final rules for listing species or designating critical habitat, effective until October 1, 1995. The "moratorium would give Congress time to develop full-blown legislation to rewrite the Endangered Species Act, which everyone says is overdue" (*Public Lands News* 1995c). A bill drafted by the House Resources Committee "would discard the listing of species and habitat set-asides in favor of a massive attempt to help presently imperiled species recover" (*Public Lands News* 1995d). Other attempts to forestall additional listing may be expected, and counter proposals as well.

Scott (review comments) noted that simply prohibiting the listing of additional species does not improve the status of the species and may simply be putting off the recovery process. This may result in greater conflicts and increased costs of recovery, two of the very things that many interested in revising the ESA are seeking to avoid (J. M. Scott, review comments).

### Question 8. What actions are underway to prevent the need to list candidate species?

Candidate species pose major uncertainties about the future. The only thing for certain is that it is better for all parties concerned to attempt to accommodate the needs of these species before they get to the point where listing under the ESA is necessary. There are more management options available prior to listing than afterward.

Two items are featured in this chapter. First, the Idaho Conservation Effort is highlighted. It is an attempt to address the needs of candidate species through the development of Habitat Conservation Assessments and Conservation Strategies as precursors to potential Conservation Agreements. Second, federal land and resource management agencies are committed to implementing the concept of ecosystem management. This commitment was driven partly by a recognition that there must be a better way to protect biological diversity than on a species-by-species basis, which is the ESA approach. It is too early to say whether or not the Idaho Conservation Effort or ecosystem management will be successful in keeping additional species from being listed under the ESA.

#### Conservation Agreements

According to the FWS, "An important purpose of the ESA is to encourage creative partnerships between the public and private sectors and among governmental agencies in the interest of species and habitat conservation and to develop comprehensive conservation plans" (US-FWS 1994a, p. 13). This is consistent with section 6 of the ESA. The Conservation Agreement (CA) process is one way to facilitate these partnerships and promote efforts to maintain viable populations of certain candidate species.

CAs are formal written documents agreed to by the FWS and another federal agency, state agency, Indian tribe, local government, or a private entity to achieve the conservation of candidate species through voluntary cooperation (US-FWS 1994a). The CA documents the specific actions and

responsibilities to which each party agrees, with the objective to reduce or eliminate threats to a candidate species as well as its habitats (US-FWS 1994a). CAs are considered to be a strengthening and focusing process to address the protection needs of candidate species. CAs are developed as a means to reduce threats to candidate species which may eventually result in removing them from the C1 or C2 list. While the species is under the protection of a CA, it remains in either Category 1 or Category 2. If the status of a species improves to a point where listing is deemed unnecessary, the species is reassigned to Category 3C and is no longer eligible for listing. If the effectiveness of the CA is such that the expected outcome is not realized, a proposed or emergency listing procedure may be necessary (US-FWS 1994a).

The FWS provides guidance and general information concerning candidate species management actions and opportunities. Such efforts are undertaken to reduce threats to candidate species and to stabilize or improve candidate species populations and the ecosystems upon which they depend (US-FWS 1994a). The efforts aim to encourage cooperative programs with state agencies, other federal agencies, conservation organizations, Indian tribes, local governments, and private landowners.

Candidate species management actions, also known as "prelisting recovery" and "candidate stabilization actions," are activities undertaken for any Category 1 or Category 2 (C1 or C2) candidate species to help reduce threats to the species. The types, timing, and degree of threat to a species determine the actions to be taken. Where opportunities for effective management of a candidate species exist, a prescription of management actions for a given candidate species are developed to address the threats that are specific to that species (US-FWS 1994a).

Examples of the range of activities that may be employed to benefit candidate species are as follows:

- Habitat protection,
- Habitat management or restoration,
- Species management,
- Education and information transfer,
- Existing legal and economic incentives, and

- Coordination with Federal agencies, Tribal, State, and local governments and the private sector; e.g., promote Conservation Agreements. (US-FWS 1994a).

### The Idaho Conservation Effort

Approximately 90 species of plants and animals have been identified by the FWS as candidate species in Idaho, and another 45 are "sensitive species" or "species of special concern" identified by other agencies (CDC 1994). As a result of *The Fund for Animals* litigation (see Question 7), the FWS has until October 1996 to either list them all as threatened or endangered or provide evidence why they should not be so designated (Gallagher 1995). Essentially all the candidate species spend at least part of their life on lands managed by the Bureau of Land Management (BLM) or U.S. Forest Service (USFS). In addition to the FWS candidate species lists, the BLM and USFS (Regions 1 and 4) have developed sensitive species lists and the Idaho Department of Fish and Game (IDFG) has a "species of special concern" list.

Based on the ideas presented by the FWS concerning candidate species management actions and triggered by *The Fund for Animals* litigation, an interagency effort under the leadership of state agencies was initiated in Idaho in 1993 and formalized in 1994 as the Idaho Conservation Effort. The goal was to remove threats and develop CAs for candidate and sensitive species and reduce the need to list them as threatened or endangered. The interagency Idaho Conservation Effort has developed draft program guidance called "The Prelisting and Conservation Agreement Program in Idaho" (US-FWS 1995a) describing processes for the development of Habitat Conservation Assessments, Conservation Strategies, and Conservation Agreements. The IDFG has used these guidelines to forge a cooperative effort between the IDFG, the Idaho Department of Parks and Recreation (IDPR, which has state responsibility for plants), the FWS, Regions 1 and 4 of the USFS, and the BLM. This is a proactive effort in the management of imperiled species not yet listed under the ESA. The objective of the program is to protect

candidate and sensitive species by developing CAs to remove threats and maintain a broader degree of management options and flexibility than might be possible if the plant or animal were listed as threatened or endangered.

A national Memorandum of Understanding (MOU) between the USFS, FWS, BLM, NPS, and NMFS was signed in January 1994, establishing a framework among cooperators to address the needs of species that are tending toward federal listing as threatened or endangered. The national MOU established a consensus among the cooperators to use CAs whenever possible throughout the nation. The cooperators seek to improve efficiency by combining their efforts, fostering better working relationships, and promoting the needs of species, thus encouraging protection of national biological diversity.

The national MOU (a copy is in PAG files) states:

In 1973, the Endangered Species Act (ESA) was enacted to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved" and make it "the policy of Congress that all Federal departments and agencies shall seek to conserve endanger and threatened species and shall use their authorities in furtherance of the purposes of this Act." Data collected by state Natural Heritage Programs across the United States show that some 9,000 U.S. plant and animal species are rare, seriously declining in numbers and/or are likely to be at risk of extinction within the foreseeable future.

Addressing the threats to these species, thereby reducing or possibly eliminating the need for their listing as endangered or threatened, is of benefit to the cooperators and the nation.

This agreement will be of particular value for those species that require an inter-forest, inter-regional, and/or ecosystem approach to effectively conserve their habitats.

A state MOU creating the Idaho Conservation Effort was signed in December 1994, establishing a framework for cooperation and participation in the management of federally listed candidate and sensitive species and "species of special concern" to the state of Idaho (see Sidebar 8-1). This state MOU was the first of its kind in the country. Under direction from the state MOU, the IDFG and IDPR will administer the

Sidebar 8-1. Federal/State Agency Cooperative Memorandum of Agreement  
for a Conservation Strategy

The signatures of the representatives of the federal agencies listed below indicate support for the State's efforts described in this MOU. The federal agencies are neither "cooperators" nor "parties" to this MOU. The State's work described in this MOU is related to a Sike's Act [Sike's Act of 1974 (P.L. 93-452) Cooperative Agreement (RO-R4-55A-87-000) executed in 1987. However, the importance of this new undertaking merits some clarification of the limitations on federal participation in the State's efforts because of the provisions of the National Environmental Policy Act (NEPA), *the Federal Advisory Committee Act (FACA)* and the statutes governing land management planning for federal lands, e.g. the National Forest Management Act (NFMA), the Federal Land Policy and Management Act (FLPMA), etc. Federal employees will not be members of the Operational Committee, the HCA/CS Development Teams, or the Technical Committee. However, federal employees may be invited by such groups to provide information. This will avoid any federal decision-making, as well as any appearance that federal decisions are being made, directly or indirectly, during the State's process prior to the transmission of the anticipated State Habitat Conservation Assessment (HCA) and State Conservation Strategy (CS) to the federal agencies. No federal action will be taken with respect to the anticipated HCA or CS and no Conservation Agreement (CA) will be considered or executed by the federal agencies on the basis of the HCA and CS until after the completion of any federal processes which may be required under NEPA, FLPMA, and NFMA, or other applicable legislation.

Note: emphasis added.

development of Habitat Conservation Assessments (HCAs) and Conservation Strategies (CSs).

The state MOU established an Operational Committee, called the State Conservation Agreement Steering Committee, comprised of agency heads in Idaho to provide program guidance. A Technical Committee was also established, consisting of scientists to implement the program by coordinating activities between teams assembled for individual species and the Operational Committee. Additional agencies, organizations, and individuals are invited to assist, depending upon land ownership patterns and expertise. The draft organizational prelisting process established by the state MOU is illustrated in Figure 8-1. The Technical Committee provides technical review and assistance to species teams in the development of HCAs, CSs and CAs.

The Technical Committee compiles a list of species to be addressed by the program which is subject to approval by the Operational Committee (see Idaho's "short list" and "long list" of species, Tables 8-1 and 8-2 respectively). Species are selected based on a number of factors. Criteria may include the

degree of threat to the species, species rarity, and status of the species determined by the FWS (US-FWS 1995a, 48 *Fed. Reg.* 43098, among others).

Steps in the conservation process involve the development of 1) an HCA of known information on the species or complex of species, 2) a CS of known threats to the species and how to remove them, and 3) a format for a CA in the form of an action document. Example formats of an Idaho CS and CA are on file with the PAG or available from the IDFG or the BLM.

A completed CS is reviewed by the Technical Committee and Operational Committee, and subjected to public review. Completed CSs are presented to either the Fish and Game Commission (for animals) or the Board of Directors for Parks and Recreation (for plants) for approval as state-recommended activities for species conservation. The HCA and CS are released to the federal land management agencies and state or private landowners as a state-approved strategy.

As per the state MOU, the HCAs and CSs will represent appropriate scientific information for federal agencies to consider and process through NEPA, NFMA, FLPMA,

### Organizational Chart For Prelisting Program

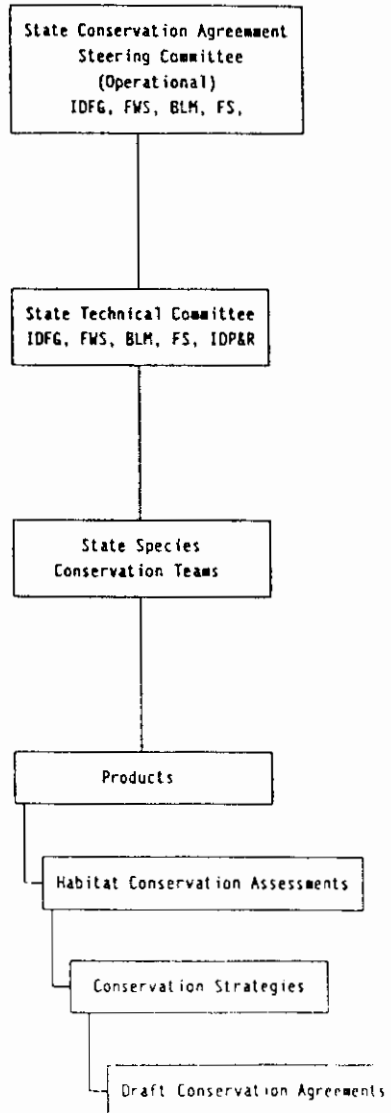


Figure 8-1. Draft organizational chart for the prelisting process of The Idaho Conservation Program.



Status*	Name
C1	Bull Trout
C2	Bonneville cutthroat trout
C1	Idaho ground squirrel
C2	Wood River sculpin
C2	Harlequin duck
C1	Christ's indian paintbrush
SSC	Coeur d'Alene salamander
C2	Idaho dunes tiger beetle
C1	St. Anthony evening primrose

Source: CDC (1994).

\* C1, C2, are federal candidate species (see Sidebar 6-1); SSC is Idaho Department of Fish and Game "species of special concern";

and other federal requirements in order to draft a Conservation Agreement. Most CAs will require full public participation under NEPA before being finalized. Once a CS is adopted as a state-recommended strategy, implementation occurs through a CA. Each land management agency (federal or state) or private landowner who agrees to implement the CS will be required to draft and sign a CA with the FWS. In most cases, the CA will apply only to federal and specific state lands (those managed by the IDFG and IDPR), although private lands and other agencies are encouraged to participate voluntarily (Thomas and Lewis 1995).

Why go through all this effort? Managing imperiled species as an alternative to listing them under the ESA is an advantage to everyone. One reason is that consultation requirements under section 7 of the ESA are not required. This gives state agencies more flexibility with limited funds and manpower to undertake biological evaluations.

The Conservation Agreement for a species is not an end in itself, and should not be viewed as a solution to prevent ESA listing (R. Howard, review comments). It is developed as a means to identify threats to candidate species and, when implemented, to reduce these threats. After a number of years, this may eventually result in removing the species

from the C1 or C2 list of candidate species maintained by the FWS (R. Howard, review comments).

The BLM and FWS have successfully entered into Conservation Agreements (CAs) in the past, specifically to protect 19 species of rare plants in Oregon and southern Idaho (Gallagher 1995). These efforts have been relatively easy, because plant populations are small, immobile, and the actions to protect them more easily identifiable. For animal species, the CA effort is a new endeavor. The initial CA effort in Idaho began with the bull trout—a wide-ranging species for which protection efforts will be controversial (see **Appendix C**).

According to the FWS and the IDFG, there are 3 strong candidates for listing—northern Idaho ground squirrel, Bonneville cutthroat trout, and bull trout. The bull trout was upgraded from a C2 to a C1 candidate status in June 1994 when the FWS issued a "warranted but precluded" ruling. The required status review in June 1995 kept the bull trout in this category. An HCA/CS for the bull trout was made state policy by the Idaho Fish and Game Commission on January 20, 1995.

As of February 1995, in addition to the Bull Trout CS, 8 HCA/CS documents were in draft form for review by the Operational Committee

or the Fish and Game Commission (Table 8-1) and 20 more of the *species* in Table 8-2 had HCA/CS documents in preparation.

Table 8-2. "Long List" of candidate *species* to be addressed in Idaho in 1995.

Status*	Name
C1	Aase's onion
C1	Alkali primrose
SSC	Bear Lake sculpin
SSC	Bear Lake whitefish
SSC	Bonneville cisco
SSC	Bonneville whitefish
SSC	Bear Lake cutthroat
C2	Columbia sharp-tailed grouse
C2	Cusick's chaenactis
SSC	Fisher
C2	Fine-spotted cutthroat trout
C2	Leatherside chub
C2	Lynx
C2	Milkvetch
C2	Mountain quail
C1	Mulford's milkvetch
C2	**Northern goshawk
SSC	Northern loon
C1	Radiate goldenrod
C2	Redband trout
C2(RC1)	Salmon twin bladderpod
SSC	Shoshone sculpin
C2	Slick spot peppergrass
C2	Smooth stickleaf
C2	Spotted bat
C2	Spotted frog
C2	Townsend's big-eared bat
C2	**Trumpeter swan
SSC	Westslope cutthroat trout
SSC	White-headed woodpecker
C2	Wolverine
C2	Woven-spore lichen
S	Yellow phacelia

\* C1, C2, are federal candidate species (see Sidebar 7-1); SSC is Idaho Department of Fish and Game "species of special concern"; S is State Rank indicator; C2(RC1) is a C2 species recommended for C1 status. \*\*denotes species for which a habitat conservation assessment (HCA) will be prepared. A decision will be made upon completion of HCA whether to proceed with a conservation strategy (CS) and/or conservation agreement (CA).

Source: CDC (1994).

The Conservation Agreement process is in its infancy and when developed in Idaho and elsewhere should become another tool that can be used to address the needs of candidate *species*. It does, however, have limitations. Some parts of the process will be applicable to all candidate *species* but it is best suited for localized *species* rather than wide ranging *species* (R. Howard, review comments).

The focus of IDFG efforts is to expand to a multi-species approach:

- Write and develop individual habitat conservation assessments and strategies for candidate *species*;
- Then look for "common threats" (habitat requirements, effects of management practices);
- Write a combined Conservation Strategy or put together a multi-agency Conservation Agreement to address multi-species and ecosystem-level concerns.

Within the Idaho State Conservation effort, IDFG's role is to write individual HCAs and CSs for candidate *species*. Two examples of how this will expand to multi-species concerns will be combining cutthroat trout and redband trout HCAs and CSs, and combining "forest carnivore" (lynx, wolverine, marten, and fisher) HCAs and CSs (C. Harris, pers. comm.).

### Ecosystem-level Protection

Conservation biologists and other resource managers have said the ESA should focus on ecosystems, not just on population segments of *species* that are imperiled (see Noss 1991b, Salwasser 1991, Scott et al. 1991). From a conservation perspective, the ESA doesn't go far enough because it doesn't protect ecosystems. In order to prevent *species* from becoming extinct, it would seem to be a good idea to protect the ecosystems on which they depend. One of the biggest advantages of ecosystem protection is that it allows us to protect *species* while they are still common and it's possible to reach biologically defensible compromise while still meeting society's needs, thus reducing conflicts (Scott, review comments).

Some observers feel that the single-species approach of the ESA is not the best way to protect rare elements of biological diversity.

In a survey of state wildlife agency personnel, Melquist (1995) found that 85 percent of respondents thought that the individual species approach was not the most effective and needed to be changed. Eighty-six percent of the respondents supported greater emphasis on multi-species and ecosystem projects.

Many biologists argue that an ecosystem-wide approach is necessary to avoid the kinds of piecemeal approaches and conflicts resource managers face (LaRoe 1993). Conflicts between protected species on the same ground have a potential for conflict. Wayne Melquist of the Idaho Department of Fish and Game has said that sometimes ESA recovery efforts conflict. For example, increasing numbers of wolves in the Selkirk Mountains could lead to increased predation of caribou (Titone 1992). Situations like these argue strongly in favor of an ecosystem approach to management.

The situation on the Idaho Panhandle National Forests raises the issue of coordinating ESA recovery efforts. This 2.5 million acre domain includes habitat for grizzly bears, woodland caribou, and gray wolves, among other imperiled species. David Wright, forest supervisor, said, "I'm having a real problem with the application and implementation of the Endangered Species Act in a piecemeal fashion. I see there's some interest in [listing] bull trout in the region. I'm sure neotropical birds will be important down the pike. It just doesn't stop" (Titone 1992).

In addition to arguments that species-oriented management is not working are three other reasons to support the need for an ecosystem-based approach: 1) resource management problems are increasing in complexity, space, and time; 2) resource management at a larger geographic scale allows managers to consider their activities in the context of surrounding land uses; and 3) improved cost effectiveness (LaRoe 1993).

The ecosystems approach to species conservation is supported by Rep. Kika de la Garza (D-TX), former Chairman of the House Agriculture Committee. He said, "If we continue to look at each critter individually, we will continue to face these problems many times in the future" (Associated Press 1991).

The FWS agreed, in December 1992, to

review petitions for listing new endangered species through an ecosystem-wide approach. For example, in the Pacific Northwest the spotted owl, marbled murrelet, and several salmon species have been and are being reviewed separately. If a similar situation were to arise in the future, all of them would be reviewed at one time.

At one end of the spectrum of ecosystem-level protection is the view that entire ecosystems, not just critical habitat for a single species, should be reserved from all human uses that might endanger species. Such an approach would isolate rare elements of biological diversity from human activities before they become threatened or endangered. Some observers (for example, Kunich 1994) have suggested that the Endangered Species Act be complemented with an Endangered Ecosystems Act.

Such a focus on ecosystem isolation probably will not provide any relief from current ESA conflicts. It is difficult to see how broader, more expansive protection of land areas will alleviate current conflicts between conservation of individual species and development projects, other than to make the regulatory functions of the agencies easier. For example, the FWS might expand the National Wildlife Refuge System to include all the new "endangered ecosystems" that might be so designated based on biological needs (see, for example, Noss et al. 1995). The land would come from other federal agencies or be purchased from state and private landowners. Such an approach may not be politically acceptable.

A more moderate view of ecosystem-level protection is a concept called ecosystem management where human activities and resource management activities are allowed within ecosystems, but the effects of those activities are viewed at the broader ecosystem-level scale.

### Ecosystem Management

The idea of ecosystem management has been around for more than a generation (see Caldwell 1970), yet the concept is still in its formative stages (see Keiter 1990). The ecosystem management approach is to manage

landscapes as a whole rather than as separate components (Everett et al. 1994b). The report of the National Research Council committee on *Science and the Endangered Species Act* (NRC 1995) addressed the importance of ecosystem management:

The field of ecosystem management has also emerged as a significant field of applied biology, in part as a response to the need for a more global view of conservation imperatives. The rich growth of these areas of science has also illuminated areas where our knowledge is still inadequate.... A challenge for the future is to find more integrated mechanisms to sustain both species and ecosystems that do not depend on case-by-case management. (Clegg 1995, p. vii).

Despite diverse definitions of ecosystem management and despite scientific uncertainties, it is clear that managing ecosystems and landscapes as an addition to the protection of individual species can lead to improved natural-resource management and can help reduce species extinctions. Properly implemented, it can help to reduce species extinctions. Properly implemented, it can also help to reduce uncertainty and thus reduce economic disruptions. (NRC 1995, p. 11).

The message that seems to come through here is that ecosystem management has much to offer in species conservation, despite the inadequate knowledge that exists to implement the concept now.

#### *Developments in the Pacific Northwest.*

Because ecosystem management promises so much in species conservation, it is worth briefly reviewing recent developments in the Pacific Northwest. Not surprisingly, given the large areas of federal forest land in the region, the U.S. Forest Service has been at the leading edge.

Opportunities for improvement of the implementation of the ESA on national forests were presented to the Idaho Legislature in 1994 by Stephen Mealey, who at the time was the Boise National Forest Supervisor, with additional responsibilities for coordinating activities in all Idaho national forests. Among his recommendations was:

Manage to maintain and improve healthy ecosystems. This is a major new agency focus, to consider all resources on a broad landscape scale, especially to maintain broad patterns and

processes considering their historic ranges of variability. This has the best potential for long-term solution to the individual species protection problem. (Mealey 1994).

Many discussions of how national forests should be managed focus on biological diversity. This is partly because the National Forest Management Act of 1976 says the Forest Service is to provide a diversity of plant and animal communities, and partly because some species have become or currently face becoming extinct due to human impacts on ecosystems. U.S. Forest Service Deputy Chief James Overbay (1992) said that ecosystem management on the national forests has "a bias toward diversity."

Some discussion of ecosystem management occurred during President Clinton's historic Forest Conference in Portland, Oregon, in April 1993. The idea is to set in place a policy that moves beyond spotted owl conservation controversies by considering much broader ecological impacts on old-growth forests, water systems, soils, and other wildlife. The objective of an ecosystem management plan should be to maintain the full range of biological diversity, process, and function (FEMAT 1993).

#### *Challenges for Ecosystem Management.*

Ecosystem management is far from an easy solution to existing problems. Among the reasons why resource policy makers have been reluctant to adopt such an approach are: 1) it expands the political jurisdictions that must be considered, creating greater potential for conflict; 2) an ecosystem is a difficult ecological concept, whose definition involves some arbitrary judgment; 3) it increases the biological complexity managers must face; and 4) it may be more expensive initially than a single-species approach (LaRoe 1993).

Federal land and resource management agencies have committed to ecosystem management as a new philosophy, and are grappling with implementation. The federal ecosystem management concept is only partially developed, and there is still much to learn about managing ecosystems. For example, it is not clear what the roles of reserved versus actively managed areas should be in order to provide desired ecosystem

attributes in the long term under a changing climate, altered disturbance regime, and increasing human populations.

One obstacle for the implementation of ecosystem management as a solution for imperiled species is the lack of a mandate within ESA. Congress declared that "The purposes [of the Act] ... are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, ... [and] to provide a program for the conservation of such ... species" (ESA § 2(b)). This declaration of purpose is a hortatory, not mandatory, statement. Although ESA does require protection of a species' critical habitat, it is seldom designated, and the Act has no mandatory provisions for either defining ecosystems or conserving them. Indeed, the definition of conservation in the Act (ESA § 3(3)) is focused on species, not habitat or ecosystems.

Professor Arthur Smith (1995a), of the University of Idaho College of Law, emphasized that ecosystem management is not specifically required by any federal law. Furthermore, definitions of ecosystems are highly variable, and in spite of much rhetoric, it is not at all clear that ecosystem management will necessarily facilitate compliance with existing laws (Smith 1995a).

Another challenge for ecosystem management is that ecosystems are units defined by humans for scientific purposes, and are difficult to delineate. To use ecosystems as units to define land-use boundaries mixes science with politics.

Political scientists Freemuth and Cawley (1993) said until ecosystem management boundaries are delineated, people are shut out of the management planning process and asked to accept whatever solution agency scientists want to impose on a given land area. This, they said, is why attempts at ecosystem management in the Greater Yellowstone Area have not met with success. They presented two competing viewpoints on ecosystem management. First, it is a way for professional resource managers to apply scientific principles to resource management questions. As such, its legitimacy has been established, and it is neither an opinion nor a

preference. The second viewpoint is that the words ecology and ecosystem are "political code words guaranteed to meet opposition from commodity user groups" (Freemuth and Cawley 1993). Thus an ecosystem-based approach is viewed as an opposing alternative to traditional resource management practices. Viewed from this second vantage point, ecosystem management is a preference or opinion that has not been made legitimate through public deliberation (Freemuth and Cawley 1993).

In reference to the spotted owl situation, Yaffee (1994) pointed out the importance of boundaries as a way to reduce uncertainty:

[T]he response to the owl case suggests that all parties presently involved with the controversy would be happier with some certainty: the environmentalists, that certain objectives will be sought by agencies they do not trust; the timber industry, that the levels of commodities available from the federal lands are defined with greater certainty than has been possible in the past ten years, so that investment decisions can be made accordingly; and the agencies that their decisions will endure. Surprisingly, all of these parties would be happier with boundaries that provide measurable directions and control. (Yaffee 1994, p. 363).

Conservation of the northern spotted owl has unintentionally evolved toward ecosystem-based management because other policies as well as species are involved (Meslow 1993). As demonstrated in the salmon case example in **Appendix B**, riparian and upland concerns for aquatic species require consideration of a much broader array of concerns than do terrestrial species.

Ecosystem management will also require long-range planning, and as Yaffee (1991) pointed out the endangered species problem is a land-use problem, requiring long-range comprehensive planning in a society that abhors centralized planning.

Because ecosystem management has not been rigorously defined and is a fluid concept at this point, there is concern from all sides about what it will mean for resource management and species survival. According to Jim Geisinger, a spokesman for the forest products industry in the Pacific Northwest, ecosystem management is a way to break the

timber gridlock in the region. Environmental groups reacted suspiciously to industry's embrace of ecosystem management. Part of the reason is that industry stipulated that ecosystem management be applied across a broader land area than just the fraction of national forests currently allocated for timber production today (Associated Press 1993c).

Perhaps the greatest challenge for ecosystem management is overcoming the lack of adequate knowledge about ecosystems and adjusting traditional management practices to incorporate this new knowledge. New knowledge of ecosystem dynamics in the Inland Northwest underpins the need to consider new resource management strategies (see Everett et al. 1994a, Sampson and Adams 1994). For example, it is likely that ecosystem management in the fire-dependent forests of the Inland West may require more management intervention than has been practiced for decades, not less, as seems to be the case for late-successional forests in the spotted owl region (O'Laughlin et al. 1993).

The need for and use of reserve or buffer areas illustrates the complexity of the biological issues in ecosystem management. Some species, such as salmon, require high water quality, and activities, such as timber harvest and associated road building, can increase sediment loads in streams if not done properly. The task is to keep sediment out of streams. The principal mechanism for doing this is identification of riparian protection zones, or what generally can be called riparian buffer strips. These have been a feature of state forest practices acts in the Pacific Northwest for two decades (see Belt et al. 1992, Belt and O'Laughlin 1994). Buffer zones or reserved areas historically have been used to restrict or eliminate management activities in some areas.

Although such action may be necessary as an immediate protection measure, it can cause administrative fragmentation and associated problems over time. The dynamic nature of the reserve area is not considered and the disturbance events that created and maintained these sites are not conserved (Everett et al. 1994b).

Everett et al. (1994b) identified the development of buffers or reserve areas as a

reflection of concern for a single management action, such as local timber harvest activities. Such a narrow focus does not reflect adequate concern for other disturbances such as fire, livestock grazing, insect hazard, or flooding that occur at larger landscape scales. Reserve or buffer boundaries are usually "hard" in the sense that few if any management activities are allowed. However, management may be necessary to maintain the desired habitat features in the protected landscape, especially in the dynamic forest ecosystems of eastern Oregon and Washington (Everett et al. 1994b). Thus in Everett et al.'s (1994b) model reserved areas with fixed boundaries and limited activities do not seem consistent with ecosystem management. However, Harris (1984) presented an opposing viewpoint based on island biogeography theory.

Harris' (1984) model is based on the forests of the Cascades in western Washington and Oregon. He proposes that in ecosystem management reserve or buffer areas will be necessary to serve as "islands" for species dependent on the type of habitat that is being reserved, and that the number and location of "islands" will be critical so that immigration can take place across the "sea" of altered areas.

Two very different models emerge depending on the type of forest being modeled. Everett et al.'s (1994b) model is based on the higher disturbance forests of eastern Oregon and Washington, whereas Harris' (1984) model is based on the lower disturbance forests of western Oregon and Washington. The point is that ecosystem management must recognize geographic differences and be flexible enough to adapt management accordingly. Ecosystem-based management of the drier forests of southern Idaho may be expected to be different than that of the wetter forests of northern Idaho.

The effort initiated by FEMAT (1993) has now crested the Cascade Mountains and moved east, with the Eastside Ecosystem Management Project headquartered in Walla Walla, Washington. The scope of this project is the entire upper Columbia River basin, including Idaho and western Montana as well as the eastern portions of Oregon and Washington. There is evidence that the Eastside Project will

not be a carbon copy of FEMAT. Consider what the Science Integration Team (1994, p. 45) wrote about riparian buffer strips:

By using models, relevant management actions and scenarios can project social and biological outcomes.... Outcomes, not means to outcomes, should be the basis for evaluating performance; fish populations (outcome) rather than riparian buffer zones (means).

The case examples of salmon and bull trout (see **Appendices B and C**) illustrate several relevant points about ecosystem-based management. Species conservation concerns in an aquatic environment are much more complex than terrestrial environments because the former are affected by the latter, in ways that are not fully understood.

### Dominant-use Zoning and Biodiversity Protection

Protecting the rarest elements of biological diversity—that is, species threatened or endangered with extinction—is difficult under any set of circumstances. In the long run, the best strategy may be a preventative one. Another approach to a preventative strategy that may help with some of the species conservation problems under the ESA and the National Forest Management Act mandate to provide plant and animal diversity is what some resource economists and conservation biologists call dominant-use zoning.

*Wild Forests* (Alverson et al. 1994) attempted to broaden the view of resource managers to include conservation biology principles. *Wild Forests* presented elements of a biodiversity management strategy for national forests, including: 1) a new landscape scale for forest management; 2) the elevation of science; 3) a new definition of wilderness, from a biotic perspective; 4) reinventing the multiple-use concept to incorporate dominant-use zoning; 5) expanding legal protection for biodiversity; and 6) managing with an understanding of the limits of our knowledge (Alverson et al. 1994).

Perhaps the most novel aspect of the proposed *Wild Forests* policy is that of reconsidering multiple-use forest management, which is still the purpose of the national forests, as dominant-use zoning. This is an

idea resource economists have promoted for more than two decades as a way to interject meaningfulness into the nebulous concept of multiple-use federal land and resource management (Clawson 1975, Zivnuska 1980). The idea has now caught hold with some conservation biologists. Alverson et al. (1994) summarized the current debate of two counterpoints concerning multiple-use management of forestlands. One view of multiple use is that timber harvests enhances wildlife and other social values. The counterpoint is that multiple use should be replaced by something else. As species and their habitats decline, the obvious answer is to place more land into wilderness and other land-use designations that preclude timber harvesting opportunities.

Alverson et al. (1994) suggested a middle-ground view that reserved lands and multiple-use lands can co-exist, but the traditional view that timber harvesting benefits other uses should be rethought. They suggested what forest resource economists have long recognized. Certain uses have dominated many multiple-use management plans and it is a myth that all uses can coexist at some point on the same tract of land. In *Wild Forests*, they stated it as follows:

Society must bluntly face the fact that logging is currently a dominant use in so-called multiple-use lands through its pervasive effects on the surrounding landscape. Only a similarly dominant use for conservation over large areas can successfully protect biological diversity over the long term. By demonstrating these two sides of the coin, conservation biology leads us to accept dominant-use zoning as the relevant and appropriate subset of management approaches which should now be considered. (Alverson et al. 1994).

Federal and state agencies and private landowners, Alverson et al. (1994) asserted, should acknowledge this point and define multiple use as including lands for which active and passive management to restore natural forest conditions becomes a primary objective. Wilderness and other protected areas should not be perceived as apart from multiple-use lands, but rather as an important part of an integrated management plan for forested areas at the scale of hundreds of

thousands of acres.

It all seems to be a matter of scale, and a dominant-use approach when viewed at a large scale will provide a mix of different uses, or multiple use.

In spite of the merits dominant-use zoning might have, it is not at all clear how this approach, or an ecosystem-based approach, will relieve the existing problems of single-species management required by the ESA. At best, these broader approaches might preclude the need to list some additional species in the future. There are, however, some serious questions to answer besides more cost-effective ways to protect all elements of biodiversity. Those questions include comparing the costs of biodiversity protection with other social goals.

### Conclusions

There were 961 federally listed species in the United States on March 1, 1995. There were almost 3,800 other species identified as candidates for listing in May 1994. In Idaho, there are 18 listed species and approximately 135 plants and animals with a potential to be listed; 90 of them are on the FWS candidate lists.

It is apparent that the numbers of species listed under the ESA annually has increased (see Figure S-1). Many species identified as candidates have lingered in such categories for years awaiting action by the FWS. State and federal natural resource agencies have programs that attempt to effectively identify candidate species and undertake efforts to conserve them. The interagency Idaho Conservation Effort is a serious attempt to do so. The future of protection for imperiled species may lie in these early conservation efforts. Effective actions for candidate species might include these considerations:

- reduce threats to candidate species;
- seek to stabilize and recover candidate species populations and their habitats;
- seek collaborative and innovative partnerships with private landowners and county-level and other local government units as well as state and federal agencies.

It is now widely recognized that the single-species approach has its weaknesses. A recognition of the importance of habitat moves conservation away from numbers and

populations to ecosystems and their management for species conservation. Because almost all of our ecosystems have been affected by human activity to some degree, ecosystem-level management is becoming the focal point of much conservation effort. As the federal agencies develop and operationalize the concept of ecosystem management, there is a potential to reduce the problem of individual species protection (Mealey 1994).

Of significance is the recognition by the National Research Council committee (NRC 1995) that new approaches to natural resource management are necessary:

Often, resource managers manage areas either for protection of biota or for human use. It is increasingly difficult to keep people and the effects of their activities separate from wildlife sanctuaries. Although such sanctuaries (e.g., national parks, wilderness areas, wildlife refuges, marine sanctuaries) are indispensable for protecting endangered species, greater attention needs to be paid to developing mixed-use areas.... Although the value of this approach is becoming increasingly recognized, its development is still in the early stages. (NRC 1995, p. 11).

Considering the term "ecosystem management" then, the NRC committee acknowledges that more attention needs to be placed on the latter word as the concept is implemented.

One of the most significant issues in ecosystem-level conservation is the role of disturbance in maintaining patterns of structure across large areas or landscapes. This is a basic ecosystem process that those who argue for active management of ecosystems and those who argue for passive management must take into account, particularly in Idaho and other areas of the Inland West where disturbance by fire is an important ecosystem process.

Whether ecosystem-level management is done passively or actively, there must be a recognition that to maintain ecological processes at the ecosystem level, changes in land-use practices may be necessary. In other words, it can be said that ecosystem-level management for species conservation as well as the production of human-desired goods and services is fundamentally a resource allocation issue.



Status*	Name
C1	Bull Trout
C2	Bonneville cutthroat trout
C1	Idaho ground squirrel
C2	Wood River sculpin
C2	Harlequin duck
C1	Christ's indian paintbrush
SSC	Coeur d'Alene salamander
C2	Idaho dunes tiger beetle
C1	St. Anthony evening primrose

Source: CDC (1994).

\* C1, C2, are federal candidate species (see Sidebar 6-1); SSC is Idaho Department of Fish and Game "species of special concern";

and other federal requirements in order to draft a Conservation Agreement. Most CAs will require full public participation under NEPA before being finalized. Once a CS is adopted as a state-recommended strategy, implementation occurs through a CA. Each land management agency (federal or state) or private landowner who agrees to implement the CS will be required to draft and sign a CA with the FWS. In most cases, the CA will apply only to federal and specific state lands (those managed by the IDFG and IDPR), although private lands and other agencies are encouraged to participate voluntarily (Thomas and Lewis 1995).

Why go through all this effort? Managing imperiled species as an alternative to listing them under the ESA is an advantage to everyone. One reason is that consultation requirements under section 7 of the ESA are not required. This gives state agencies more flexibility with limited funds and manpower to undertake biological evaluations.

The Conservation Agreement for a species is not an end in itself, and should not be viewed as a solution to prevent ESA listing (R. Howard, review comments). It is developed as a means to identify threats to candidate species and, when implemented, to reduce these threats. After a number of years, this may eventually result in removing the species

from the C1 or C2 list of candidate species maintained by the FWS (R. Howard, review comments).

The BLM and FWS have successfully entered into Conservation Agreements (CAs) in the past, specifically to protect 19 species of rare plants in Oregon and southern Idaho (Gallagher 1995). These efforts have been relatively easy, because plant populations are small, immobile, and the actions to protect them more easily identifiable. For animal species, the CA effort is a new endeavor. The initial CA effort in Idaho began with the bull trout—a wide-ranging species for which protection efforts will be controversial (see **Appendix C**).

According to the FWS and the IDFG, there are 3 strong candidates for listing—northern Idaho ground squirrel, Bonneville cutthroat trout, and bull trout. The bull trout was upgraded from a C2 to a C1 candidate status in June 1994 when the FWS issued a "warranted but precluded" ruling. The required status review in June 1995 kept the bull trout in this category. An HCA/CS for the bull trout was made state policy by the Idaho Fish and Game Commission on January 20, 1995.

As of February 1995, in addition to the Bull Trout CS, 8 HCA/CS documents were in draft form for review by the Operational Committee

**Question 9. What are the major ESA issues?**

Five ESA issues were identified and analyzed by Bean (1991). These issues are central to evaluating the ESA, and therefore important in reauthorization debates. A few points related to each issue follow, and serve to illustrate why these issues are contentious. It is not the purpose of this report to support one side of the argument or the other, but to present the facts.

**(1) The ESA: Stunning Success or Colossal Failure?**

Does the ESA work? Does it meet the goal of recovering species facing extinction? Some possible criteria for evaluating the Act are number of species recovered and delisted, number of species downlisted from endangered to threatened, and number of species that have gone extinct since the ESA became law in 1973.

As of the end of 1994, 944 species had been listed in the United States. Between 1973 and 1994, 22 species were delisted, but only six of them were because the species had recovered enough to be delisted (Table 9-1). Seven species left the list when the FWS declared them extinct (see McMillan and Wilcove 1994), but only the extinction of the dusky seaside sparrow (a subspecies) occurred since 1973. The other six were discovered to already be extinct at the time when they were listed. Nine delistings resulted from errors in the data used to list the species (Mann and Plummer 1995c).

According to Mann and Plummer (1995c), five of the delistings are not attributable to the Act itself, but to other circumstances. Scott (review comments) disagrees, claiming that the Act forced action to remove the limiting factors, thus it was responsible at least in part for recovery. Three of the five recovered species are birds found only on Palau, an island under U.S. trusteeship in the Western Pacific. The birds were listed in 1970 because hostilities on the island during World War II had created conditions that imperiled them. The birds were delisted in 1985, long after the factors causing endangerment had been removed. The southeastern population of the

brown pelican was delisted in 1985, principally because the insecticide DDT was banned and no longer imperiling pelicans, as well as protected peregrine falcons and bald eagles. One ESA success story as of 1993 was the American alligator, which was fully recovered in 1987. But even this success has doubters among the scientific community, because southern states had taken actions in the 1960s to control alligator harvest. Although fully recovered, the alligator remains on the threatened list and receives protection because it resembles the endangered American crocodile (Mann and Plummer 1995c).

The Arctic peregrine falcon and the California gray whale were both considered recovered in 1994. The falcon was delisted in November 1994. Can the delisting of the gray whale be considered an ESA success story? The population increased from less than 10,000 in the late 1930s, to about 21,000, and is now estimated to be about as large as in pre-whaling days (US-FWS 1994d). Some observers argue that international treaties banning whaling thus probably had more to do with recovery of this species than our federal laws.

What about downlisting from endangered to threatened status? Eleven species have been reclassified (Table 9-2). Again factors other than ESA recovery efforts, such as the banning of DDT, have played a role in some downlistings. Mann and Plummer (1995c) suggest that the reclassification of four trout species had more to do with concerns about illegal takes associated with other sport fisheries than conservation efforts. The *Federal Register* (40 FR 29864, July 16, 1975) indicates that the 30 day comment period on the final rule was suspended so affected sport fisheries could be opened sooner, but there is no suggestion that the downlisting was biologically indefensible. However, the *Federal Register* does indicate that both Utah prairie dogs and gray wolves in Minnesota were downlisted, in part to prevent problems associated with illegally killing endangered species (49 FR 22334, May 29, 1984 and 43 FR 9612, March 9, 1978, respectively).

In mid-1994, the FWS provided its biennial report to Congress, *Endangered and Threatened Species Recovery Program*, with

Table 9-1. U.S. threatened and endangered species status changes, through 1994.

Removed from list . . . . .	2
Recovered and delisted (year) . . . . .	[6]
California gray whale (1994)	
Arctic peregrine falcon (1994)	
Brown pelican, Southeastern U.S. (1985)	
Three species of birds on Palau (1985) <sup>1</sup>	
Declared extinct <sup>2</sup> . . . . .	[7]
Listed in error <sup>3</sup> . . . . .	[9]
Recovered, not delisted . . . . .	[1]
American alligator (1987) <sup>4</sup>	
Downlisted from <u>endangered</u> to <u>threatened</u> <sup>5</sup> . . . . .	11
Dual listing (simultaneously <u>endangered</u> and <u>threatened</u> ) <sup>6</sup> . . . . .	6

<sup>1</sup> Palau is a U.S. protected island in the western Pacific Ocean.

<sup>2</sup> Only one species went extinct since 1973, the dusky seaside sparrow (a subspecies).

<sup>3</sup> See McMillan and Wilcove (1994).

<sup>4</sup> American alligator, recovered but remains in threatened status due to resemblance to endangered American crocodile.

<sup>5</sup> See Mann and Plummer (1995c).

<sup>6</sup> See US-FWS (1995b).

Source: Mann and Plummer (1995c,d), McMillan and Wilcove (1994), US-FWS (1995b).

data through fiscal year 1992. Of the 711 species listed as of September 1992, 69 (or not quite 10%) had populations described by the agency as "improving" or making progress toward full recovery; 28% had "stable" populations, indicating declines had been halted. But 33% of the species were "declining"; the population status of 27% was unknown; and 14 species (or 2%) were thought to be extinct (US-FWS 1994g). (McMillan and Wilcove [1994] identified 17 listed species that are probably extinct.) Less than 60% of the listed species had a recovery plan, making progress toward recovery difficult to measure. Of those species with recovery plans, more than 80% had not met half of the goals listed in their plans (Mann and Plummer 1995c,d).

Do these data mean the Act is a failure? Mann and Plummer (1995c, p. 246) replied, "Not necessarily." Many species may be so rare and extinction-prone as to be

unrecoverable, especially when two decades of attempts to reverse the trend are balanced against three centuries of habitat transformation (Mann and Plummer 1995c). Scott asked (review comments), how many more species would be extinct, if the act did not exist? No one can give an accurate answer to that question because of the mixture of policy and management actions that have contributed to species survival. On the other hand, Eisgruber (review comments) stated that if the ESA fails to achieve what it is supposed to achieve, it is a failure regardless of the reasons for failure. Goble (review comments) responded that using Eisgruber's criterion, laws against murder are failures and should be abandoned.

During 1994, supporters of a "strong" ESA conducted a campaign seeking to publicize success stories. The campaign featured the bald eagle, our national symbol that would be downlisted from endangered to threatened

Species	Reasons for Downlisting
Utah prairie dog	Increased populations stressing carrying capacity of available habitat; disease increase due to overcrowding; conflicts with agriculture; reduce illegal killing by allowing regulated hunting
Gray wolf (in MN)	Increased populations; reduce illegal killing by allowing regulated hunting
Bald Eagle	Banning of DDT; increased populations; improved habitat conditions
Arctic peregrine falcon*	Banning of DDT; increased populations; improved habitat conditions
Alleutian Canada goose	Predators (foxes) eradicated; hunting restrictions
Tinian monarch	Habitat improved and populations increased, but new threats from introduced insect and snake
Snail darter	Reintroduction; more populations discovered
Apache trout	Successful culture in hatcheries; renovation of habitat
Greenback cutthroat trout	Habitat protection; removal of hybridization threat
Lahontan cutthroat trout	Reintroduction into habitats; successful culture in hatcheries; renovation of habitat; removal of hybridization threat
Paiute cutthroat trout	Removal of competitors; removal of hybridization threat; reintroduction into habitat

\* species was delisted in November 1994.

Source: *Federal Register* and Mann and Plummer (1995c).

status throughout its range in the lower 48 states in August 1995. Those arguing against "strengthening" the ESA invoked the DDT argument—eagles were helped not so much by the ESA as by the DDT ban as well as protection under the Bald Eagle Protection Act of 1940 (Landsberg 1994).

Some ESA "success stories" were touted in an Associated Press report (Landsberg 1994): the American alligator, black-footed ferret, California condor, and southern sea otter. The

alligator situation was mentioned above. The ferret and condor "success" was the result of captive breeding programs funded through ESA. The southern sea otter is protected by the ESA, the Marine Mammal Protection Act of 1972, and by a special law Congress passed in 1986 (Publ. L. No. 99-625 § 1).

Does the ESA work? Supporters for "weakening" the ESA say no, based on the recovery data; those for "strengthening" the ESA say the question is basically unfair. They

say that for many species we have waited too long to act and the recovery data show that. Thus using quantitative criteria to judge the Act's success may indeed be unfair. But if we have waited too long and it is not possible to recover all species everywhere, then the ESA needs changing because that is what the current law says we must do (Eisgruber, review comments).

## (2) The Act's Costs: Inordinately Expensive or Miserly Cheap?

One highly publicized reason for ESA controversy is the cost of implementing the Act. It is difficult to put a price tag on species conservation efforts, but the various costs associated with the ESA, considered separately, reveal that the Act is anything but inexpensive (Lambert and Smith 1994).

**Government Expenditures.** In the 1978 *TVA v. Hill* ruling, the Supreme Court established that the costs of saving species are irrelevant; the ESA must be implemented "whatever the cost." Estimating the total amount the government has spent on the ESA is difficult because Congress did not ask federal and state agencies to keep track of the funds spent on species conservation until 1988. From 1981 to 1992, the FWS appropriations for ESA implementation totaled approximately \$440 million in 1991 dollars. All federal expenditures for 1981 to 1992 totaled almost \$12.2 trillion (U.S. Bureau of Census, 1994) so ESA implementation represented approximately 0.004 percent. Government expenditures on ESA are not limited to Service outlays, however. Agencies other than the FWS and NMFS provided 91 percent of the total expenditures for the five species receiving the most funding in 1990. In 1991, other federal and state agencies outspent the Service by almost two to one (US-FWS 1991). In total, federal and state agencies reported spending over \$290 million on endangered species protection in 1992 alone (Lambert and Smith 1994). The total for federal and state spending for 1992 was \$701 billion, thus endangered species protection accounted for 0.04 percent.

In 1990, the Inspector General of the

Department of the Interior estimated the cost in federal expenditures of recovering listed and candidate species over the next decade at \$4.6 billion. According to Lambert and Smith (1994), this figure is probably extremely low. Bean (1991) said the estimate "must be taken with a very large grain of salt," but did not say whether it was too high or too low. He did say "that is slightly less than the \$4.7 billion Americans were expected to spend on video games in 1991."

Whether or not the Inspector General's recovery cost estimate was accurate, it does not embrace all ESA expenditures. The \$4.6 billion estimate is only for recovery costs. According to the Service's 1993 budget justifications, for every dollar the FWS spends on recovery, the agency spends \$2.26 on consultation, permitting, law enforcement, and listing (Lambert and Smith 1994).

**Job Losses and Social Costs.** The social and economic costs of recovering endangered and threatened species are not limited to government financial expenditures. When a species is listed, any activity resulting in "harm" to the species or its habitat must be stopped—regardless of the cost of stopping that action. Protecting some species results in very little social cost, while protecting others may result in substantial social impacts.

The case of protecting the threatened northern spotted owl in the Pacific Northwest has been one of the most visible and controversial cases where protecting a species has had significant impact on jobs. The estimates of the number of forest products industry jobs that will be lost due to spotted owl conservation varies widely depending on assumptions, the baseline used, and the projection period. Employment in the industry has been and continues to be cyclical. FEMAT's (1993) estimate was approximately 6,000 direct jobs lost with 1.12 indirect jobs lost per direct job. That estimate was revised to 11,000 direct jobs in February 1994. Projections by forest products industry representatives are higher.

While the estimates of exact numbers vary, almost everyone agrees that some forest products industry jobs in the Pacific Northwest have been and will be lost due to spotted owl

conservation actions. However, while industry jobs have decreased, employment in other sectors has increased. Projections of economic ruin for the Pacific Northwest because of the spotted owl have not come true.

This does not mean that there are not personal hardships and social costs associated with the loss of a job and finding a new one, perhaps in a different place or industry. The social costs of job losses may include increased domestic violence, suicide and other serious problems (see Lee 1994, Carroll 1995). Individuals and communities in the Pacific Northwest have suffered even though the region as a whole has prospered.

It is difficult to quantify which job losses in the timber industry are attributable to the ESA and what the social costs of those job losses are. The same will be true for other protected species that need habitat in areas where humans seek economic gain from natural resources. This is what makes the issue so contentious.

*Miserly Cheap?*—According to Bean (1991), more resources are needed than are currently being made available for the Act's administration. The Inspector General said so, the FWS agreed, the environmental community thinks so, and this is the conclusion of those who point to the "failure" of the Act to accomplish more than it has to date.

How much more is needed? A useful comparison would be with the federal programs designed to assist states with fish and wildlife programs. The Pittman-Robertson and Dingell-Johnson Acts channel federal excise taxes to the states in support of game and fisheries management, respectively. In 1991, about \$300 million in federal excise taxes went to support these two programs. If that is what it takes to have effective programs for a few dozen game species, Bean (1991) argued that perhaps at least that much would be required for successful conservation programs aimed at recovering the more than 900 species in this country that face the threat of extinction. By comparison, the amount being appropriated is a "pittance" (Bean 1991).

Scott (review comments) pointed out that the estimate of \$4.6 billion in recovery costs over the next 10 years averages out to about \$2 per person per year for each citizen of the U.S.

### (3) The Act Needs More "Balance," but Which Way?

Perhaps the theme heard most often in ESA debates is that the Act needs to find a better "balance" between conservation needs and other social objectives, especially economic development. According to Bean (1991), the two premises of this are, first, that conflicts between species conservation needs and other objectives are common; second, the Act offers no satisfactory means of resolving these conflicts (Bean 1991). Lambert and Smith (1994) argued in support of these propositions. The "balance" argument is driven by value positions of those on the "strengthen the ESA" side of the scale and those on the "weaken the ESA" side. A middle ground approach is to find ways to make the ESA more effective, as Mann and Plummer (1995c) said they have tried to do, and as this report tries to do.

Under the ESA mandate, managers are attempting to strike a balance between the needs of protected species and humans. However, people on both sides of the issue are claiming that the balance has moved too far from where they think it should be. In the face of existing scientific uncertainty, political judgments become necessary. Moral, cultural, social, and economic values come into play, as do institutional factors such as executive agency structures and budgets, and the interpretation of agency actions by the courts. Thus the issue of species conservation involves many value judgments (MacCracken et al. 1994).

For example, the revised recovery plan for grizzly bears is controversial among those with different scientific as well as resource management perspectives. Some scientists believe that the recovery criteria are inadequate and population monitoring methods unproven, while others believe that recent population increases and progress on habitat protection are adequate for the revised plan to be effective. Scott et al. (1995) stated that the issue of how to incorporate biological and non-biological factors into the grizzly bear recovery plan may lie at the heart of the controversy. Perhaps these arguments mean the plan is fairly balanced, and therefore the appropriate course of action to pursue under

the current laws of the land. Or perhaps the debate means that it is difficult to find the balance between human needs and desires, including economic development, and species conservation that is the overall goal of the ESA (MacCracken et al. 1994).

This issue is covered in more detail in Question 13, which seeks to find a role for economic analysis in the ESA.

#### **(4) Subspecies and Populations: Does the Act Protect Too Much?**

What is a species? This is one of the key questions in the multidisciplinary field of conservation biology, which develops the theoretical and empirical bases for species conservation. An overview of conservation biology is provided in Appendix A. This section explores what the concept of species is under the ESA, and illustrates the situation with the cases of Snake River sockeye salmon and gray wolf, which appear to be treated quite differently under the Act.

The ESA defines species to include "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature" (ESA § (3)(16)). The inclusion of subspecies and distinct populations of vertebrate species means that the ESA can be, and is, used to protect locally endangered population segments of species relatively abundant in other parts of their range. This provision of the Act is controversial and has contributed to the misperception that the overall growth of the number of listed species is due to listing of subspecies and populations.

Wilcove et al. (1993) stated the facts: less than 2% of additions to threatened or endangered lists between 1985 and 1991 were populations, and less than 18% were subspecies, although percentages are much higher for mammals (70% subspecies) and birds (53% subspecies and 27% populations). Overall, subspecies or distinct population segments represented more than 10% of the plants and animals listed in 1991. As part of their review of ESA recovery plans, Tear et al. (1993) looked at subspecies protection for two mammals and birds and concluded they are underprotected. However, Tear et al.

(1993) said that inclusion of populations and subspecies could overwhelm the ESA process.

Secretary of the Interior Manuel Lujan in 1990 pondered in public about the need to protect every subspecies. The Inspector General of the Interior Department, in a 1990 report, off-handedly suggested that perhaps the Act should be limited to full species, as a way to bring conservation costs in line with the levels of funding Congress has been providing. After leaving his post, Frank Dunkle, U.S. Fish and Wildlife Service director in the Reagan administration, proposed that the Act not protect subspecies (and presumably populations of species) that are common elsewhere (Bean 1991).

Some of the biggest ESA controversies involve less-than-full species, including the northern spotted owl, a subspecies, and various salmon runs, which are population segments (Bean 1991). Eliminating protection of subspecies and populations would definitely reduce ESA costs, but it would also increase the chances of species loss (J.M. Scott, review comments).

Elimination of protection for subspecies and populations also would end years of federal efforts to recover some of the best known and most popular animals protected by the ESA, including the bald eagle, peregrine falcon, southern sea otter, grizzly bear, Florida panther, gray wolf, Sonoran pronghorn antelope, Aleutian Canada goose, Key deer, Everglades snail kite, Columbia white-tailed deer, masked bobwhite quail, and brown pelican. According to Bean (1991), it would also remove a flexibility provision of the Act. The authority to list and protect individual populations means other populations can remain unlisted. In most cases if it comes to a choice between protecting a species everywhere or nowhere, the choice of the FWS would be everywhere that it is in jeopardy (Bean 1991).

In the journal *Conservation Biology*, Hunter and Hutchinson (1994) used the term "parochial approach" to describe the protection of species isolated to small areas at the edges of their geographic range. They identified two shortcomings and seven virtues of the parochial approach to species conservation. The shortcomings of the parochial approach

are 1) skewed allocation of funds, meaning some species are not allocated funds in proportion to their need, but rather public support for their cause; and 2) lack of an ecological context, or a failure to consider local populations in a larger context. The seven virtues of the parochial approach are 1) genetic diversity, 2) ecological roles, 3) local values, 4) umbrella species, 5) conservation organizations, 6) surrogate species, and 7) avoiding endangered status (Hunter and Hutchinson 1994).

What is the appropriate biological scope of the ESA—is species, subspecies, or population the appropriate level of concern? Stephen Jay Gould (1990) teaches biology, geology, and the history of science at Harvard University. One of his essays in *Natural History* addressed the need for conserving subspecies:

I do not think that, practically or morally, we can defend a policy of saving every distinct local population of organisms. I can cite a good rationale for the preservation of species—for each species is a unique and separate natural object that, once lost, can never be reconstituted. But subspecies are distinct local populations of species with broader geographical ranges. Subspecies are dynamic, interbreedable, and constantly changing; what then are we saving by declaring them all inviolate?

I will stoutly defend species, but we cannot ask for the preservation of every distinctive gene, unless we find a way to abolish death itself (for many organisms carry unique mutations)... [F]or local populations of species with broader ranges, the brief for preservation must be made on a case by case basis, not a general principle of preservation. (Gould 1990).

Having said that, Gould examined the cases of the spotted owl and the Mount Graham red squirrel—the point of his essay—and found support for their preservation.

For the purpose of conserving genetic diversity, the ESA is concerned about distinct population segments of species, thus it allows biological subdivisions to be treated as individual species. Some observers believe that the ESA definition of species is ambiguous (Rohlf 1989) and biologists have applied it inconsistently. For example, salmon species are split apart into separate populations with

individual runs or stocks being listed separately but the entire gray wolf species is listed even though only some subspecies are imperiled. This may appear inconsistent. The salmon and wolf are further illustrated in the following sections.

**Saving Sockeye.** Five species of Pacific salmon inhabit North America. Biologists have identified hundreds of distinct stocks or runs of these five species, and some runs are treated as individual species under the ESA. The winter run of chinook salmon in California's Sacramento River was listed as threatened in 1989 and is now endangered. The Snake River sockeye is endangered; the fall run and combined spring and summer run of Snake River chinook salmon are threatened.

The American Fisheries Society has identified 76 native stocks of salmon and steelhead trout in the Columbia River system that are of special concern (Nehlsen et al. 1991). A distinguished group of scientists under contract to the state of Oregon said, "the present state of science does not allow us to make precise determinations of the genetic differences among stocks of Pacific salmon." (Botkin et al. 1995, p. 13). Nonetheless, the NMFS has specified two criteria that must be met in order to list a stock: a) the stock must be substantially isolated reproductively from other stocks of the same species; b) the stock must represent an important component in the evolutionary legacy of the species—i.e., the stock must contribute to the ecological and genetic diversity of the species as a whole (Hyman and Wernstedt 1991, Waples 1991).

Considering the cultural, historic, and economic importance of salmon in the Pacific Northwest, the brief for the protection of salmon runs may be considered persuasive. Consider also that the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (16 U.S.C. § 839 et seq.) is a federal policy requiring that salmon be given "equitable treatment" with respect to other uses of the Columbia River system. Destroying salmon runs cannot be called equitable treatment. The ESA has been invoked to handle an issue that another policy was designed to address.

In 1989, only two sockeye salmon were



counted ascending the fish ladder at Lower Granite Dam, the last of eight dams on the Columbia and Snake Rivers before the fish enter Idaho. In 1990, one sockeye was counted at the dam. In 1991, four salmon returned to central Idaho's Redfish Lake—named for the profusion of sockeye that historically made the 900-mile journey from the sea. These four fish were removed to a hatchery. In 1992, "Lonesome Larry" was the only returnee. It may or may not be too late to save sockeye runs in Idaho.

Are the few sockeye salmon that spawn in central Idaho necessary for the perpetuation of the sockeye salmon species? Between 20 and 60 million sockeye salmon spawn in Alaskan rivers, and they thrive in Canada and some Columbia River tributaries in the state of Washington. If one can buy a can of sockeye salmon in a supermarket anywhere in the country, it is understandable that some people would question a public policy that labels sockeye salmon as an endangered species. But that reasoning does not take into consideration that Snake River sockeye may provide the genetic diversity that allows the entire species to recover from some unforeseen calamity or to continue to evolve.

Although no one has suggested that this run should go extinct, it is reasonable to ask how much money should be spent to recover Snake River sockeye salmon, and to ask, as Gould (1990) did, what is "the brief for preservation"? (L. Eisgruber, review comments). The ESA does not require such a brief. If the Service says a distinct population segment is worthy of preservation, the policy, as stated by the United States Supreme Court, is to do it, "whatever the cost." (*TVA v. Hill* 437 U.S. 153, 184 [1978]).

The salmon issue, of course, is much more complex than just deciding which stocks are to be protected by the ESA. The protected stocks must be recovered. Snake River salmon is the most challenging issue the ESA has faced, and is analyzed in **Appendix B**.

**Saving Wolves.** The gray wolf is another example of a species that as a whole does not face extinction, but populations in some areas are at risk. Dunlap (1988) reported that when the wolf was proposed as an endangered

species in 1966, the Division of Wildlife Services in the FWS protested that the timber wolf was doing well in Canada and was not really endangered. Wolves were listed anyway. Gray wolves now occupy only 3 percent of their former range in the U.S. outside Alaska (Mladenoff et al. 1995). Biologists have recognized as many as 24 North American subspecies (Peek et al. 1991). Some of these subspecies—including those that roamed the northern Rocky Mountains—were purposely wiped out as the American West was settled.

When wolves were originally listed, only certain subspecies were listed. In 1978, the FWS decided to list the entire gray wolf species because (1) taxonomy was out of date, (2) wolves wander outside of recognized subspecies boundaries and (3) some wolves from unlisted subspecies may occur in certain parts of the lower 48 states (43 *Fed. Reg.* 9607-9613, March 9, 1978). The FWS recognized that the entire species was endangered or threatened to the south of Canada and considered the matter most conveniently handled by listing only the species name. Several agencies, including the USFS, requested assurances that biological subspecies would continue to be maintained and dealt with as separate entities. The FWS gave that assurance (43 *Fed. Reg.* 9607-9613, March 9, 1978).

A divisive current issue is the reintroduction of wolves in two areas of the northern Rocky Mountain region—Yellowstone National Park, and central Idaho. Arguments against wolf recovery efforts say it is pointless to replace one subspecies that has been eradicated with a different subspecies brought in from somewhere else (Tracy 1991).

Wildlife biologists recognize the distinctions among most wolf subspecies as rather fine, with possibly as few as five valid subspecies (Peek et al. 1991). Canadian wolves are similar to the northern Rocky Mountain wolf in food habits and habitat occupied. To wildlife biologists, the movement south of Canadian wolves into formerly occupied wolf range makes consideration of the subspecies issue unnecessary as long as transplant stock for Yellowstone comes from nearby Canada or Montana (Peek et al. 1991).

Although wolves thrive in Alaska and Canada (where they are not listed) and are getting along fairly well in Minnesota (where they are listed as threatened), the FWS translocated wolves to two areas where the agency believes that can be done with minimal human conflict. The reintroduced populations are considered as "experimental non-essential" for species conservation under section 10(j) of the ESA. The delisting goal or recovery in each of the three northern Rocky Mountain recovery areas is 10 breeding pairs, or approximately 100-150 wolves in each of the three areas. According to Peek et al. (1991) approximately 40,000-50,000 gray wolves occupy about 80% of their former Canadian range and approximately 5,200-6,500 wolves live in Alaska on about 84% of the state's land area. It is therefore understandable that some people would question the merits of a public policy that takes on the burden of social conflict and expends federal tax dollars to introduce such a controversial species when there are so many members of the same wolf population segment north of the Canadian border. But they are afforded protection under the ESA because of the way the law defines species. The evolutionary time scale argument is that distinct population segments may become important in the future either as sources of genetic diversity to help perpetuate the current species or as sources of genetic material for new species (J.M. Scott, review comments). But the goal of the ESA is not to provide evolutionary development of new species, it is to recover species now.

Some inconsistencies appear to exist in the way the FWS has treated Idaho wolf recovery versus other areas. The agency has not developed a recovery plan for the North Cascades, even though wolves are reestablishing there (Laufer and Jenkins 1989). The states of Arizona, New Mexico, and Texas have successfully fought off the federal plan to reintroduce gray wolves there, and the animals that were to be reintroduced are kept in a zoo. The reasons for the inconsistencies are not clear.

Other issues besides recovery may be involved with wolf reintroduction. American attitudes and policies towards wolves have changed. They are a symbol of the

wilderness, and like the wilderness itself, wolves formerly were an obstacle for humans to conquer. Now many people feel that wolves have a right to exist that is unrelated to their value to humans (Dunlap 1988). Perhaps the fabled big bad wolf in Little Red Riding Hood will never be universally popular, but new attitudes—such as those evident in Farley Mowat's (1963) *Never Cry Wolf* and the subsequent Disney movie in 1983—have helped the wolf shed part of its bad image. For many it is no longer "the beast of waste and desolation," as President Theodore Roosevelt described it. A handsome gray wolf appeared on the cover of *Outside* magazine and therein 300,000 paid subscribers were provided a sympathetic portrait (Bass 1991). The millions who read *Newsweek* magazine were presented with a cover story on wolves that said:

Reintroduction isn't about anything so straightforward as saving a species; ... The northern gray [wolf] ... is not about to disappear. For conservationists, returning wolves to Yellowstone would show that the nation has changed its mind about the wild as something to be subdued—if not destroyed. (Begley et al. 1991).

Resolution of the wolf issue may have great social significance on several levels. The authors of a law review article said:

The question of who will have final management responsibility for the wolf strikes at the heart of local cultural mores, contemporary environmental values, and constitutional federalism principles. ... [The] ESA has displaced state authority and vested the U.S. Fish & Wildlife Service with management responsibility for the recovery effort. ... [T]he wolf recovery controversy ... is now ripe for a negotiated resolution in a political forum.

[R]estoration of the wolf can be viewed as the end of an era of agricultural dominance on the public domain and the ascendancy of ecosystem-oriented resource management policies. (Keiter and Holscher 1990).

In the case of the gray wolf reintroductions, the ESA may have been invoked to do something besides guard against extinction.

*What is "Actual Injury" to a Species?* The significance of the unlawful take issue can be

illustrated by looking at a specific case, in this instance, spotted owl conservation. The case is *United States v. Anderson & Middleton Logging Co.* (No. C93-5697R [W.D.Wa., filed Dec. 9, 1993]) or, more simply, *A&M*. The government is seeking to enjoin timber harvesting on a privately owned 72-acre tract on the Olympic Peninsula in order to protect a northern spotted owl that allegedly lives 1.5 miles away (Macleod 1995). Usually the FWS relies more on the threat of prosecution than on actual prosecutions to induce conformance with its view of ESA duties (Gidari 1994). *A&M* is one of only two cases the government has ever brought to enjoin an alleged ESA section 9 taking violation (Macleod 1995).

Macleod (1995) is a Washington, D.C. attorney for the forest products industry. He is extensively cited in this section (indeed, there would not be such a section without his insights). He argued the *Sweet Home Chapter* case before the United States Supreme Court in April 1995, and had hoped that the case would provide some guidance on the meaning of the "harm" regulation. (It did. The FWS regulatory definition does not exceed the agency's authority.) Beyond *Sweet Home Chapter*, Macleod (1995) looked to the *A&M* case, which he called the first real "battle of the experts" in the spotted owl context. For habitat modification to be a take, the "harm" regulation says there must be "actual injury" to a protected species (50 CFR § 17.3, also 46 *Fed. Reg.* 54749 [Nov. 4, 1981]). The courts have consistently recognized that "harm" requires "actual injury" (*Sweet Home*, 1 F.3d at 4, 806 F.Supp. at 284 n.1, 286; *American Bald Eagle*, 9 F.3d at 165, 166). Furthermore, the federal government stressed the "significant limitations" that the "actual injury" requirement imposes on the "harm" regulation in its petition to the Supreme Court in *Sweet Home* (Macleod 1995).

The basis for the government's suit against *A&M* is that the proposed timber harvest will "harm" the pair of owls that live 1.5 miles away by "significantly impairing their essential behavior patterns"—particularly their reproductive capacity at some indeterminate future time (Macleod 1995). The government does not know whether these owls have ever visited the *A&M* site, how old they are, how

large they are, how strong they are, how far they can fly, whether they have ever reproduced, whether they are capable of reproducing, or even whether they are still alive. The case is based on average characteristics of owls on the Olympic Peninsula, derived from radio telemetry studies of nine owl pairs more than seven years ago (Macleod 1995). This is the "best data" available, as the ESA requires.

About three years ago, in a biological opinion under section 7 of the ESA, the FWS authorized the "incidental taking" of this very same pair of owls in connection with a nearby timber harvesting operation by a party unrelated to *A&M* (Macleod 1995). Perhaps this is because since that time the amount of old growth in the area has dipped below the level thought to be desirable for owl foraging needs, and the FWS does not want to permit further harvesting.

These undisputed facts illustrate some problems for both sides presented by ESA enforcement: the FWS has a problem—its mission is to protect listed species, and it may not always have ready access to refined data, thus figuring that averages should be good enough (Macleod 1995). The landowner has a problem, too, and may face the loss of a significant investment if the long-intended and otherwise fully legitimate use of her property is denied. The landowner figures that averages are meaningless when her property rights are denied; furthermore, the landowner may not want to personally subsidize some perceived public good by taking an economic hit without strict proof that the proposed land use will cause some specific injury to some specific animal (Macleod 1995).

The "actual injury" question has other important legal nuances, not the least of which are whose science governs and how precise must it be. These are fundamental questions of ESA trial law, and over time a body of case law will develop (Macleod 1995).

##### **(5) Animal Welfare Ahead of Human Welfare? (Ethics and Property Rights)**

The ESA was designed to help resolve certain conflicts between humans and other organisms. In pursuing its noble purpose, the Act has

generated conflict between the human desire for resource development to fulfill human wants and needs and the human requirement for a healthy environment.

At least two points of view provide the basis for those people who perceive that species protection is necessary. The first is a biocentric point of view, or the point of view that all species have an inherent right to exist or at least the right to struggle to exist equal to that of any other species (Miller 1990). Environmental considerations include a moral responsibility to respect all other forms of life.

The second point of view is anthropocentric, or based on the value of species to humans. Arguments include the economic importance of species for future medicines, agriculture and other products useful to humans. The aesthetic and recreational values of species to humans are also included in this point of view. To the extent that people view species protection as necessary to sustain ecosystems for human survival, this view also could be considered anthropocentric since it is based on the value to humans.

These points of view are often comingled in the debate about the ESA. Some observers feel that the ESA has assigned rights to species (Mann and Plummer 1995b), a biocentric point of view. Others argue that the usefulness of other species to humans is over-estimated or that short-term human wants and needs are more important than the long-term benefits of species survival, an anthropocentric point of view. The anthropocentric viewpoint can be debated using biology and economics. Arguments for the biocentric viewpoint are grounded in philosophy and ethics.

Has the ESA subordinated human interests to the interests of other species? Bean (1991, p. 4) said, "The challenge for supporters of the Act will be to demonstrate that the real choice is not between people and pupfish, but between long-term human welfare and more immediate perceptions of human need." Maslow (1943, 1954), a psychologist, proposed the hierarchy of human needs. People have basic survival and security needs that, in general, must be satisfied before they can give attention to the higher level social, self-esteem, and self-actualization needs. Some would argue that animal welfare is not

likely to be a concern to humans who are seeking to satisfy their basic survival and shelter needs. On the other hand, others argue that most humans, particularly in the U.S., are well beyond trying to satisfy basic needs.

Bean observed that the loss of a species of no known value is, in isolation, likely to seem like a small price to pay in return for some economic benefit, and then he compared this to deciding whether you should quit smoking one cigarette at a time. One more cigarette is unlikely to jeopardize your future health. Similarly, the loss of one more species is unlikely to imperil our future well-being. However, the cumulative consequence of a lifetime of decisions to smoke just one more cigarette may indeed threaten your health. Similarly, the cumulative consequence of decisions to sacrifice just one more species may threaten our future well-being. The species conservation choice is not between humans and other living things, it is a choice between "immediate gratification and long-term human welfare" (Bean 1991).

A *Reader's Digest* article on the ESA titled "When a law goes haywire: are the needs of rats and lizards more important than the needs of people?" (Fitzgerald 1993) asked a serious question, and provided a number of examples of how the ESA has affected people and private property. The book *Noah's Choice* (Mann and Plummer 1995c) also described a fundamental question about the Act, illustrated with several case examples: Does the ESA put animal welfare ahead of human welfare? Mann and Plummer (1995c) suggested in some cases it does, but this perception is based on their values and point of view. Others will have different perceptions. For example, Scott (review comments) pointed out that endangered species are not something that happen randomly. They are endangered for a reason. Frequently, that reason is that the health of the ecosystem in which we live and from which we make our livings are damaged (J.M. Scott, review comments).

The actions of humans inevitably impact the natural world. The ESA intends to make us more aware of what our activities do to other organisms. Carried to the extreme, the cumulative effect of limiting human activities to protect all species, subspecies and

populations that are threatened with extinction, as the ESA requires, eventually may call a halt to many human activities as we now know them. The listing of five Snake River snails in Idaho indicates something about river ecology. It also reveals that people are extending their concern for endangered species beyond larger animals and plants. Looking long-term, will each square foot of the planet harbor its very own rare species? Scientists have only catalogued 1.4 million species, and there may be as many as 30 million (Wilson 1988). We do not know how many of them are imperiled. Will we be willing to save all the animals and

plants that are? If not, how will we decide which ones to save? As currently written, the ESA does not provide any guidance on these questions, except that only plants and animals (except certifiable insect pests) qualify for protection. The Act thus covers 92 percent of the known species.

### Conclusions

It is not possible to come to any conclusion about these issues, other than to say none of them will be resolved any time soon. That is why they are major issues.

### Question 10. Does the ESA mean a shift of management control?

The protection of species may require modification of current resource management and land-use practices. The ESA imposes compliance duties on federal agencies and licensees and permittees that may require the subordination of state water rights to federal flow release schedules (Tarlock 1995). The ESA may also affect timber management, grazing, mining, and recreation activities not only on federal lands, but also on state and private lands in Idaho (see **Appendix B**).

The Idaho Legislature's resource committees convened a hearing on the ESA in January 1994 at which Steve Mealey presented written testimony. He is a wildlife biologist and forester, and at that time was the supervisor of the Boise National Forest with the additional responsibility for coordinating activities in all of Idaho's national forests. National forests represent 39% of the land in Idaho, a much more substantial proportion than in any other state (Oregon ranks second with 25%). Mealey's (1994) comments illustrate the changes the ESA brings to land and resource management:

The ESA conjures up many different images for people. Federal land and resource managers find a difference between public perception and reality in the Act's effects on national forest uses. The perception is that public uses have been drastically limited or eliminated, with a reduced emphasis on multiple use, while the reality is that although some outputs have been reduced and many uses have definitely been affected by higher costs and time delays, the Forest Service emphasis on multiple use management remains strong and unchanged. While there have been reduced outputs, project delays, and increased costs, few if any activities have been eliminated or denied. The Act has resulted in improvements in bald eagle and grizzly bear populations, and managers are learning they can have success with salmon recovery where cattle are grazed, as in Bear Valley.

The impact of listings and pending listings creates uncertainty. However, one fact is clear, yet not widely accepted: species recovery takes precedence over other uses when they conflict. This certainly has and will continue to affect traditional public expectations.

Some summary observations on the overall effects of the ESA on national forests are: 1) Our work has increased significantly, especially as a result of the salmon listing, and costs of doing business have risen as a result. Added work has included increased analysis related to consultation, appeals, and litigation. 2) Our early consultation efforts with the NMFS were inefficient compared with today's. We're learning and getting better at both basin and project level analysis. (Mealey 1994).

These comments certainly indicate that the ESA changes land and resource management in Idaho's national forests, and along with that, the expectations people have about their national forests. The former seems to be changing faster than the latter.

In response to a University of Idaho survey (Haminishi et al. 1995), Idaho forest resource managers said they expect the ESA to have a more significant impact on reducing Idaho timber harvests in the near future than any other issue. Most of that impact is expected to occur on national forests because of their extent—two-thirds of Idaho's timberland is managed by the U.S. Forest Service—but all timberland ownership categories will be affected. Across all ownerships, managers expect average annual timber harvests in Idaho to be almost 20% lower by 1997 than the annual average in the 1991-1993 period. On an issue-by-issue basis, the forest resource managers believe the ESA will have a 63% greater impact on reducing timber availability than will the next highest of twelve issues managers considered in the survey—"cumulative impacts" or what was defined in the survey as how timber harvesting impacts other resources, including water quality and recreation. The forest resource managers believe the impact of the ESA on timber availability in Idaho will be three times that of roadless area protection. Survey respondents mentioned grizzly bear and salmon as the listed species that would impact timber availability. Many respondents believed bull trout, as yet unlisted, could have an even greater impact (Haminishi et al. 1995).

One of the primary ways that the ESA has and will continue to affect Idaho is by a shift of land management control away from the individual and local and state levels of

government to the federal government. Individuals are being asked to change their ways of life for the protection of imperiled species. State agencies are being asked to change their ways of doing business, which can involve the loss of control by state government agencies over their fish and wildlife management activities, the perceived loss of private property rights, and the potential loss of water rights. Each of these three concerns is briefly analyzed in the following sections, and in more detail in the salmon and bull trout case examples (see **Appendices B and C**).

### Wildlife Management

The legal status of wildlife is an ESA issue because of the varying historical roles of the state and federal governments in wildlife management. Traditionally, access to wildlife was regulated by state government. In a series of court decisions beginning in 1918 with a decision concerning migratory birds, the states' claims to control were gradually eroded. In 1918, the *Missouri v. Holland* decision federalized regulation of migratory wildlife and stated that no one, including the states, "owns" wildlife. In 1979, the United States Supreme Court (*Hughes v. Oklahoma*, 441 U.S. 322 [1979]) updated the "no-ownership" principle for wildlife. However, according to Coggins and Glicksman (1995, p. 18-7), "states remain free to legislate fully for wildlife conservation, subject only to supreme federal law, and, of course, the United States Constitution." So while states continue to manage most wildlife-related activities, when imperiled species are involved federal regulation becomes dominant.

If the Service wants to limit fish and wildlife activities that might affect ESA species conservation, it can do so. For example, the stocking of hatchery trout and steelhead in Idaho rivers and lakes is subject to ESA section 7 consultation with the NMFS, which has in some cases delayed state activity. This issue of state and federal activity conflict is illustrated in the salmon case study (**Appendix B**).

The ESA gives the federal government authority over not only imperiled species, but

also their habitat if the Service finds endangerment is occurring. One point in species conservation that is difficult to overemphasize is that species must have habitat, and this is a continuing thread throughout this report.

### ***Critical Importance of Critical Habitat.***

Critical habitat is the area that threatened or endangered species need to survive, yet fewer than 15% of the listed species have designated critical habitat. The ESA has provisions for agencies not to designate critical habitat if it is not prudent to do so, or it is not determinable. This allows the agency much discretion.

The ambiguity associated with critical habitat (see Murphy and Noon 1991) creates confusion in the implementation of the ESA. Tobin (1990) stated that failure to designate critical habitat in no way diminishes the protection available. A "jeopardy" opinion that a proposed activity might destroy or adversely modify habitat may be issued regardless of whether the activity is to take place within designated critical habitat (Tobin 1990). Rohlf (1989) stated that agency regulations have made the critical habitat protection mandate redundant—it adds nothing to the protection requirements that agencies must undertake. In other words, threatened and endangered species are protected wherever they are, not just on critical habitat. Bean (1983) has made the same argument. Houck rebutted the argument and considered the lack of attention to critical habitat to be one of several examples of how the implementing agencies "have converted an act of specific stages and clear commands into an act of discretion ... in a fashion of their own choosing, albeit a fashion Congress did not have in mind" (Houck 1993, p. 279).

The effect of discretionary actions for habitat protection smooth a bumpy path for the Service, but create uncertainty for the rest of society. Biologists who set boundaries for species conservation must come to grips with a political reality—they have to interact with the public. Critical habitat is the mechanism Congress designed for prescribing boundaries for species conservation, and it forces interaction with the public. Avoidance of public interaction is one explanation of why

the FWS has avoided critical habitat, and may partly explain why the agency wrote regulations to use the "harm" definition in the section 9 take prohibition to protect habitat.

Smith (review comments) noted that as a matter of legal interpretation, all courts which have addressed the matter have held that lawful justification for delaying designation of critical habitat is narrow. He believes it is more accurate to say that the agency has evaded its listing duties in order to lower its visibility in the face of anticipated political pressure and more demanding administrative analysis.

Is there a problem with wildlife habitat management under the ESA if the Service does designate critical habitat? Basically, critical habitat is managed especially for the listed species, overriding any other use of that land. Coggins and Glicksman (1995) stated the resulting problem:

The presence of endangered or threatened species enormously complicates use of that area for any other resource.... This does not mean, however, that an area in which a listed species is or may be present is permanently off-limits to all human use: the ESA does not purport to create super-wilderness areas. Designated critical habitat, however, comes close. (Coggins and Glicksman 1995, pp. 15-61 and 15-62).

That statement may in part explain why the FWS avoids critical habitat. Scott (review comments) disagreed and said many human activities can and do occur in critical habitat. Many human activities occur in wilderness areas, too. It is the type and extent of activities that is at issue in creating dominant-use zones for wildlife.

If the Service designates critical habitat, economics is interjected into the ESA concurrent with or shortly after the listing of a species, but limited only to the impact of that designation, not listing and recovery of the species. Nonetheless, even this limited analysis tends to slow down the listing process because of analytical burden, or "paralysis by analysis." Some proposals for amending ESA would have critical habitat designated during recovery planning. Critical habitat designation puts lines on the map, which recovery plans should also do.

Should critical habitat be designated? If so,

should it be done during the listing process or recovery planning process? This raises a more important question regarding species recovery, the major purpose of the ESA. In many ways, designating areas for the recovery of species is land-use planning and raises issues of freedom and property rights. As Yaffee (1991) noted, species conservation is essentially a land-use problem calling for centralized planning in a society that abhors it.

### Property Rights: Take and "Taking"

Perhaps the most contentious issue in ESA species conservation is the perceived loss of private property rights for wildlife habitat management. Government must compensate private property owners for "taking" their property. (A property "taking" is not to be confused with section 9 take of an endangered or threatened species.) The problem is what constitutes a "taking." Although the regulation of land use activities may deprive the property owner of some, but not all, economic value, under current judicial interpretation, all economic value must be lost for a "taking" to occur. However, judicial interpretation of "taking" is constantly evolving, and changes will have an impact on the implementation of ESA in Idaho.

Rolston (1991), a philosopher, observed that implementation of the ESA involves a double meaning: the prohibition against the taking of species may be confronted with the unconstitutional "taking" of property. Resolution of this conflict tests our moral convictions and legal institutions involving economic values, both of which are evolving as they encounter the biological and ecological values inherent in species conservation under the ESA (Rolston 1991).

The ESA was designed by the U.S. Congress to interject adequate care and concern for the aesthetic, ecological, educational, historical, recreational, and scientific values of rare species into economic development decisions. A principal means for so doing is to prohibit any individual from taking a member of a protected species. Two cases are involved: plants and animals. Plants are the easier of the two.

When the ESA was enacted in 1973 there



was no prohibition against taking plants on public or private lands. Congress protected endangered plants in 1982 by prohibiting their collection on federal lands. This did not prohibit the destruction of plants by logging, grazing, or building dams. Reauthorization of the ESA in 1988 made it a violation to maliciously and knowingly damage endangered plants on federal land. Vandalism is banned, but that may not require people to notice what their cows eat or their ORVs crush. The 1988 amendments also prohibit "harming" endangered plants on private land in violation of state law, including trespass law (Rolston 1991). State laws vary widely. Idaho does not have any particular law on collecting or destroying endangered plants on private lands.

Animal protection against take is more complex and extensive. In the 1973 Act, "the term take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (ESA § 3). The FWS further defined take with a regulation defining "harm" to include "significant habitat modification" as a taking. Two courts of appeals have upheld this definition of taking (palila and red-cockaded woodpecker); another recently did not (spotted owl). The Supreme Court, however, upheld the FWS regulation (*Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 115 S.Ct. 2407 [1995]). The application of this regulation may bump up against constitutional protections against "taking" of private property rights (A. Smith, review comments). Problems with the take interpretation may have occurred because of the way the FWS has chosen to deal with critical habitat. Several commentators have recently focused on the controversial and unsettled ESA taking issue (see Gidari 1994, Meltz 1994, Quarles et al. 1993), now settled for the time being by the Supreme Court decision in *Babbitt v. Sweet Home Chapter*.

The situation leading to the other meaning of "taking" was described by Rolston (1991) as follows:

[W]here rare species occur on private property, it sets concentrated economic benefits to the single landowner against diffused general benefits to citizens. The landowner, also a citizen, shares in these benefits, but gains only a

soft set of benefits against heavy costs of opportunities foregone. The nation and its people enjoy the claimed benefit without cost, but the landowner, constrained in the right to hold and enjoy property, suffers economic loss. (Rolston 1991, p. 49).

If the economic loss to the landowner is severe, this restriction will offend the sense of fairness and justice shared by many people in our society and may run afoul of constitutional protections of property designed to protect some of the most fundamental values in our society. The United States Constitution, in the Fifth Amendment, addresses the "taking" of property and provides protection against it:

... nor [shall any person] be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use without just compensation. (United States Constitution, Amendment V).

More than seventy years ago, Justice Oliver Wendell Holmes observed that

while property may be regulated to a certain extent, if a regulation goes too far it will be recognized as a taking. (*Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 415 [1922]).

The key question is, when does government regulation become a property "taking"? Our system of rights in property has evolved through case law (see McElfish 1994), and is one of the most fundamental institutions in our society. The fundamental protections landowners have against governmental "taking" are due process and just compensation.

Real property, especially land, is allocated in our society through a system of property rights, often referred to as a "bundle of rights" (Barlowe 1978). Private property rights provide exclusive, not absolute, rights; never, ever, does the private landowner retain absolute rights to real estate (Barlowe 1978).

Fee simple ownership of property is the largest bundle of rights a private landowner can have (Barlowe 1978). Among other things (see Table 10-1), this gives landowners the right to possess and to use their land. The government (or "State") always reserves four powers (Table 10-1). One of them is the power to tax. Another is the "police power" to control the use of property in the interest of

Table 10-1. The bundle of rights in property.
Separable Rights of Fee Simple Ownership
<ul style="list-style-type: none"> <li>● To possess and use</li> <li>● To sell</li> <li>● To devise</li> <li>● To lease</li> <li>● To mortgage</li> <li>● To subdivide</li> <li>● To grant easements</li> </ul>
Rights Reserved To The State
<ul style="list-style-type: none"> <li>● To tax</li> <li>● To take for public use</li> <li>● To control the use of</li> <li>● Escheat</li> </ul>

Source: adapted from a figure in Barlowe (1978, p. 399).

public health, safety, morals, and the general welfare. Yet another is "escheat"—to take over a private estate for which no heirs can be located. The fourth power is to "take" private property—often called the power of eminent domain—for public use upon payment of compensation (Barlowe 1978).

The key question, again, is when does governmental regulation become a property "taking"? This is one of the murkiest areas of law:

Perhaps no area of law is as confused and difficult as the question whether governmental action constitutes a fifth amendment taking of private property requiring just compensation to sustain it....[T]he Supreme Court has repeatedly made it clear—at least since Justice Holmes' landmark opinion in *Pennsylvania Coal Co. v. Mahon*—that regulation can take property. Unfortunately, the Justices are just as consistently opaque in describing exactly under what conditions and at what point a regulatory taking occurs (Coggins and Glicksman 1995, pp. 4-7, 4-8, 4-10).

The American Planning Association has said

a regulatory "taking" may be found if one of the following seven considerations applies:

1. a land-use regulation does not relate to a legitimate state interest;
2. assuming a legitimate state interest, the regulation does not substantially advance that interest;
3. the advancement of a legitimate state interest places the disproportionate burden of securing a benefit upon a single landowner when it is more properly borne by the general public;
4. the regulation entails a permanent physical occupation;
5. reasonable investments were made prior to general notice of the regulatory program;
6. the economic effect of the regulation deprives the landowner of all, or substantially all, beneficial use of the property; or
7. the regulation abrogates an essential element of private property (e.g., the right to pass on property to one's heirs). (Blasser and Weinstein 1989, cited in Lambert and Smith 1994).

Items three and six listed above are probably those most often applicable to land-use regulations under the ESA. Restrictions of a portion of an owner's land in order to secure use and occupancy by endangered wildlife may come within the third criteria (Lambert and Smith 1994). Protection of endangered and threatened species obviously advances an important public interest. The question is, must the public pay the disadvantaged owners? This important issue is revisited in Question 13, is there an appropriate role for economic analysis in the ESA?

A recent Supreme Court "takings" case ruling makes clear that destruction of substantially all economic use is a taking unless the only practical use of the land amounts to common law nuisance (*Lucas v. South Carolina Coastal Comm'n*, 112 S.Ct. 2886 [1992]). In the *Lucas* case, the prohibition against development of two lots within an existing subdivision because of a beach protection law—enacted after the balance of the subdivision was completed—was held to constitute a "taking" requiring compensation (A. Smith, review comments).

Restrictions on the use of land to prevent the take of a listed species therefore may result in a "taking" of property requiring compensation if protection of a species' habitat

requires an owner to maintain property in its natural state or otherwise eliminate all economic value (A. Smith, review comments).

Can a "taking" occur if value is only diminished by regulation? This is best determined on a case by case basis, which is what our judicial system is for. To date, there has not been a successful demonstration that the ESA has resulted in a "taking" of private property.

Private landowners have recourse in the courts, firmly founded in the United States Constitution, the highest law of our land. Use of the courts may be a difficult and inconvenient experience, especially for small landowners (B. Wall, review comments). However, current challenges to wetlands regulation in the Claims Court and Federal Circuit will likely provide guidance to these issues, especially since the FWS "harm" regulation has been upheld by the Supreme Court in *Babbitt v. Sweet Home Chapter* (A. Smith, review comments).

As a general matter, the fact that a state or an individual is prohibited from making some uses of the land, even if those are the most economically advantageous uses, does not necessarily mean that property has been "taken."

Coggins and Glicksman (1995) summarized the ever-changing role of the "takings" doctrine in natural resources law as follows:

[D]ecisions requiring the government to compensate for regulatory impositions have been relatively rare....[P]roperty owners are sure to argue with increasing frequency that the economic impact of regulation has worked a taking. Although such arguments have not fared well to date in the public natural resources law context, past may not be prologue in this instance. Cases presenting such dramatic impacts are not inconceivable; a prohibition on any kind of development in the habitat of an endangered species is one possibility (Coggins and Glicksman 1995, pp. 4-58, 4-59).

Regarding an endangered species possibility, Coggins and Glicksman (1995) noted Yuffee's (1993) article arguing that water rights under a prior appropriations system for endangered species may be a potential unconstitutional "taking."

Coggins and Glicksman (1995) concluded

that although no revolutionary developments in the application of "takings" to federal lands and resources have occurred, that situation may change, and "takings claims may become fertile rather than futile grounds for litigation" (Coggins and Glicksman 1995, p. 4-59).

**Role of Non-federal Lands in the ESA.** State and private lands are treated together under the ESA because the Act does not distinguish among non-federal lands. Nor does it formally distinguish federal from non-federal lands.

As previously noted, both the section 7 prohibition on "jeopardizing" listed species and the section 9 prohibition on taking endangered species (and in most cases threatened species) apply to any action "authorized, funded, or carried out" by a federal agency (ESA § 7(a)(2)). If the proposed use of the state or private lands requires federal authorization or involves federal funding, the section 7 mandate is applicable. Similarly, the section 9 taking prohibition is fully applicable both to the state and its employees and to private entities. More than 90 percent (712 of 781) of the listed species as of May 1993 had some or all of their habitat on non-federal lands. These species were divided almost equally between plants (353) and animals (251 vertebrates and 108 invertebrates) (US-GAO 1994).

Non-federal lands represent a considerable portion of the total habitat for most of these 712 species (Table 10-2). As the data show 517 (about 73%) of the 712 species have more than 60% of their total habitat on nonfederal lands, while 264 (about 37%) of the 712 species are completely dependent on non-federal lands for their habitat.

Many listed species share their non-federal habitat with other listed species. More specifically, 454 species exist with other listed species on the same non-federal lands. Of these, 138 share the same nonfederal habitat with one or another listed species, while 155 share nonfederal habitat with 5 or more other listed species (US-GAO 1994).

Non-federal lands containing habitat for listed species are owned by a variety of landowners. Private landowners (private citizens and companies or corporations) are the most prevalent type of owner; 609 species have some or all of their habitat on these

Table 10-2. Estimated percentage of habitat for threatened and endangered species on nonfederal lands.

	Number of listed species			
	Vertebrates	Invertebrates	Plants	Total
1-20 percent	31	4	34	69
21-40 percent	24	6	16	46
41-60 percent	40	7	33	80
61-80 percent	40	5	30	75
81-99 percent	72	54	52	178
100 percent	44	32	188	264
<b>Total</b>	<b>251</b>	<b>108</b>	<b>353</b>	<b>712</b>

Source: US-GAO (1994).

lands. Governmental entities (state, county, and/or city governments) are the owners of lands with habitat for 516 listed species. Examples of other owners of lands containing habitat for listed species include utilities, water districts, a port district, airports, and universities. Figure 10-1 provides information on the types of landowners and the number of listed species having habitat on their lands (US-GAO 1994).

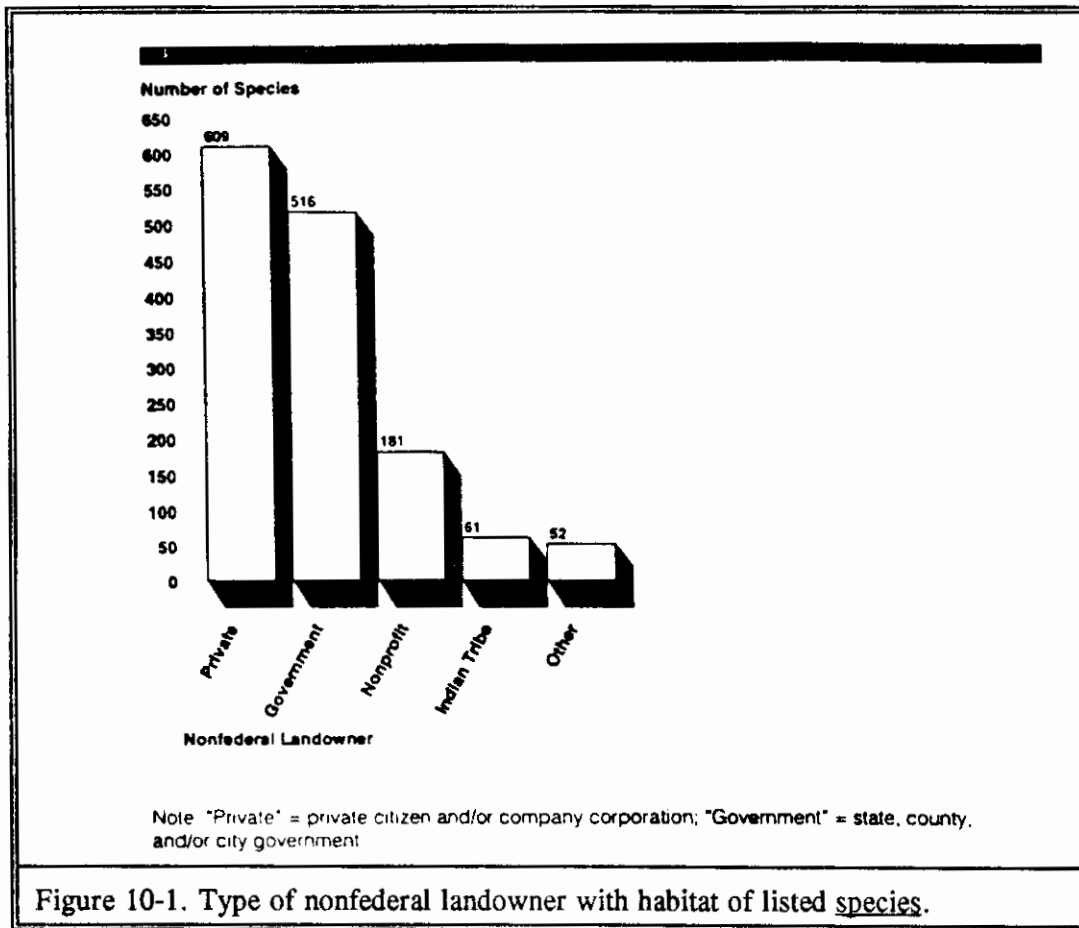
Some nonfederal lands have been designated as critical habitat for certain listed species. As stated previously, if habitat is designated as critical for a species, the Service has determined that the habitat is essential to the survival of the species and may require special management or protection. Critical habitat designated on non-federal lands receives protection under the ESA only when an activity affecting that habitat is included in a consultation under section 7; however, if the habitat for a protected species is significantly modified, it may be considered a violation of the section 9 take prohibition. According to data provided by the Service, 80 of the 105 species for which critical habitat has been designated have a portion of that critical habitat on non-federal lands. More than half of these, or 43 species, have more than 80 percent of their critical habitat on non-federal lands (US-GAO 1994).

**The Grizzly Facts.** With private lands playing such a significant role in species conservation, the clash between property rights "takings" and species taking surfaces many times. So far courts have ruled in favor of the species in question—grizzly bears.

A biologist formerly employed by the Wilderness Society stated the situation clearly:

I don't know how you get around that. You have two trends in American culture butting heads—conservation and private property.... Something has got to give somewhere. (M. Shaffer, quoted in *Public Lands News*, June 9, 1994, p. 7).

Nothing has given with grizzly bears. The prohibition against taking a listed species does not result in a compensable "taking" of property by the government even if the listed species destroys the property. For example, Richard Christy grazed sheep on land leased from the Blackfeet Indian Tribe adjacent to Glacier National Park in Montana. In July 1982, grizzly bears began nightly raids on his flock, resulting in the loss of about 20 sheep. On July 9, 1982, Mr. Christy shot and killed a grizzly bear. For taking a listed species, he was assessed a civil penalty of \$2,500. His challenge to the constitutionality of the penalty was rejected by the Ninth Circuit Court of Appeals. Noting that the ESA merely operates to bar certain means of defending property



Source: US-GAO (1994, Fig. 2, p. 6).

from grizzly bears, the court held that the statute, as applied to prevent Mr. Christy from killing grizzly bears in defense of his property, did not deprive Mr. Christy of his property without due process of law (*Christy v. Hodel*, 857 F.2d 1324, 1329n.4, 1331 [9th Cir. 1988], *cert. denied sub. nom. Christy v. Lujan*, 490 U.S. 1114 [1989]).

In the case of *U.S. Fish and Wildlife Service v. Shuler* (No. Denver 91-2, Dept. of Interior A.L.J. decision March 11, 1989), Mr. John Shuler, a sheep rancher in Dupuyer, Montana, had been losing sheep to grizzly bear predation. On the night of September 9, 1989, he attempted to drive away several grizzlies from his sheep bedding ground and prevent his sheep "from getting eaten up." During the events that followed Mr. Shuler ended up killing a grizzly bear. The FWS fined Mr. Shuler \$7,000 for taking a protected species. Although the ESA allows killing in self-defense, the judge ruled that because Mr.

Shuler was defending his property, the self-defense argument did not hold. The judge said Mr. Shuler had "purposefully place[d] himself in the zone of imminent danger of a bear attack." The fine has been reduced to \$4,000. Mr. Shuler is appealing, and grizzlies continue to attack his sheep (Sugg 1993).

Economic analysis has been suggested as a method to help resolve the private property "taking" issue associated with the ESA (Polasky 1994). The reply to Question 13 explores this potential.

**Public Opposition to "Taking."** Public opposition to land-use regulation is growing. In 1993, nearly 150 takings cases were filed in the Court of Federal Claims—up from 69 in 1992 and 52 the year before (Lambert and Smith 1994, citing Knickerbocker 1993). Moreover, for every landowner able to take a case to court, there are many more who cannot afford to fight Uncle Sam (Lambert and Smith

1994).

Recent legislative developments also indicate growing interest in protecting private property rights. In 1994, private-property protection bills were introduced in both the U.S. House and Senate and in 32 state legislatures. In addition to Idaho, the states of Arizona, Delaware, Indiana, Utah, and Washington have already enacted such laws. In late September 1993, around 500 activists from resource-dependent communities held their "Third Annual Fly-in-for Freedom" in Washington to lobby lawmakers on private property rights (Lambert and Smith 1994, citing Knickerbocker 1993). Americans are becoming outraged at the regulatory power of government agencies and the federal government's disrespect for the very core of the Western political tradition—private property rights. At the heart of this disrespect lies the ESA and its perverse incentive structure (Lambert and Smith 1994).

In essence, the ESA transforms listed species into liabilities for property owners. Each endangered species carries something like a bounty equivalent to the value of the opportunities the landowner must forego if the species is discovered on his or her land. This unfortunate result is obviously contradictory to the intent of the Act. Several examples of perverse incentives in action are provided by Lambert and Smith (1994).

Along with the actual destruction of species, landowners often accelerate development of their land and destroy listed species' habitat in order to avoid ESA restrictions. Such activity has been most visible in the Pacific Northwest, where landowners fear losing the economic value of their investment and use of their land should northern spotted owls begin using their property for nesting or feeding. Reasoning that it is better to convert a young Douglas-fir plantation into chips and paper products in order to obtain some economic value than it is to risk letting it grow, many private landowners and timber companies have accelerated their rate of cutting and shortened their rotations (Lambert and Smith 1994).

Lambert and Smith (1994) concluded with an unfavorable report card on the ESA. They said Americans are genuinely concerned about the plight of threatened and endangered

species, but are equally concerned with what they perceive to be a wasteful and ineffective government, often out of touch with the concerns of individual citizens. Inefficient use of ESA funds and the lack of attention to the needs and rights of humans foster cynicism. Some citizens feel a sense of "betrayal and outrage" that the government is violating what they perceive as their constitutional rights and "taking" their private property without any compensation (Lambert and Smith 1994).

### Water Rights

Idaho water law is based on the doctrine of prior appropriation (see Question 2). The ESA may affect the way current water law works. The recovery of listed snails in Idaho will undoubtedly involve changes in land-use practices that affect water quality in the middle reach of the Snake River. This may involve control of water used for irrigation. Barker (1993) reported that Chuck Lobdell, director of Idaho activities for the FWS, is of the opinion that irrigated agriculture in the Snake River plain must continue in order to support the aquifer recharge that keeps the Thousand Springs area, where the snails live, a viable ecosystem (see also Associated Press 1993j). The Bruneau hot springs snail has brought Idaho water law into direct conflict with the ESA. One of the factors that contributed to the determination by the FWS that listing the snail was warranted was that the Idaho Department of Water Resources did not have authority to manage groundwater for the benefit of fish and wildlife. This listing has been challenged, overturned by a district court, and reinstated following an appellate court decision (see case study under Question 12 for details).

Of special and immediate concern in Idaho is the impact that conservation of several Snake River salmon stocks listed as endangered under the ESA may have on water allocation. At this time, it is likely that rights to water would have to be purchased for use in species conservation, but if additional water is absolutely necessary for salmon recovery, the compensation issue may arise if salmon conservation diminishes a water right (see UTF 1994b).

Tarlock (1991) argued that the ESA has created a new regulatory water right. Under the ESA, specific but undetermined amounts of water must be released, or not impounded, for fish conservation purposes. These rights have no priority date and do not depend upon the express or implied intent of Congress. One possibility is that these regulatory rights may be viewed as fundamentally inconsistent with western water law, which Tarlock predicted will cause bitter disputes.

One such dispute arose in central Texas over groundwater pumping in the Edwards Plateau near San Marcos from the aquifer that San Antonio relies on as its only source of water (see *Edwards Aquifer* 36 Env't. Rptr. Cases 1533 [W.D. Tex. 1993]). As related by Albritton (1994), the fountain darter, San Marcos gambusia, Texas wild rice, San Marcos salamander, and the Texas blind salamander are all listed species that depend on the Edwards Aquifer, and their needs are imperiled by unregulated pumping from the aquifer. Even though states traditionally have sovereign power over their water, the FWS has the power under the ESA to directly regulate withdrawals from the aquifer in order to protect these species, and if the FWS continues to neglect their ESA responsibility, a private plaintiff may attempt to enforce the ESA by suing either the FWS or the pumpers. The fate of these species illustrates the broad scope of the ESA. The Act authorizes the federal government to regulate groundwater pumping, and if it doesn't take action, can be forced to do so. All pumpers who drink the water, water their crops, or use it in some other way can be found guilty of violating the ESA. The FWS has, in this case, indicated that if the state of Texas addresses the root cause of the ESA violation, which is lack of a regulatory scheme to prevent excessive pumping from the aquifer, the FWS is willing to issue an "incidental take" permit (Albritton 1994).

A second possibility is that federal regulatory rights in the ESA will be reflected in state water law as nonconsumptive water rights gain greater protection under state law, which Tarlock (1991, p. 179) stated this way: "If species protection is considered an integral element of state law, ESA remedies may take

the form of state water rights rather than federal regulatory water rights." This is an important consideration given the demonstrated potential of the ESA to require a specific quantity and quality of water be made available for the benefit of endangered species. However, Sherman (review comments) pointed out that it is hard to get "good" priority under existing law. The question becomes one of flexibility and certainty. At what level of government, state or federal, are water users to have the greatest opportunity to participate in policy formulation, and still provide water users with the security needed to plan for future investments while at the same time protecting the needs of imperiled species?

Coggins and Glicksman (1995) observed that the widening scope of litigated disputes over endangered species illustrates the growing impact of the ESA. One example is the *Stampede Dam* lawsuit in Colorado (*Riverside Irrigation District v. Andrews* 758 F. 2d 508 [10th Cir. 1985], cert. denied, 105 U.S. 1402 [1985]). The court ruled that the Department of the Interior must protect the spawning grounds of endangered fish from water diversions. Existing water rights have been purchased and new diversions are required to conform to instream flow mitigation measures mandated by the recovery plan for endangered fish species in the Colorado River (Shupe 1989).

In another example, the winter run of chinook salmon in California's Sacramento River was listed as threatened in 1989, the first distinct population segment of Pacific salmon to be listed under the ESA. In 1991, the Bureau of Reclamation was asked by NMFS to modify water deliveries to downstream users, coordinate Trinity River diversions, and release water from Shasta Dam to prevent water temperatures in spawning areas from reaching lethal levels. In the settlement of the *Glenn-Colusa* case, pumping was enjoined during salmon migration (M. Feldman, review comments; see *United States v. Glenn-Colusa Irrigation District*, 788 F.Supp. 1126 [E.D. Cal. 1992]).

In Idaho, salmon protection has not yet resulted in direct conflicts between the ESA and state water rights, largely because of the storage capacity in the Snake River basin.

Salmon conservation will to some extent rely on manipulating the timing of releases of water stored in the Columbia and Snake River system for hydroelectric generation. This "water budget" was established by the Northwest Power Planning Council (NPPC) under authority of the Northwest Power Planning Act (Wilkinson 1992, Barker 1993). The water budget is an agreement between the NPPC, the Bureau of Reclamation, Army Corps of Engineers, and the Bonneville Power Administration and operates within the contractual system of those agencies, not the state water law system. There does not appear to be enough water controlled under those contracts to provide flows needed for salmon. The budget amount of 85,000 cubic feet per second (cfs) in the lower Snake River has never been met for the entire migration period (Barker 1993). The potential for conflicts between state water rights and ESA mandates clearly exists, especially because critical habitat, which has been designated for listed Snake River salmon, may function as a *de facto* reservation of water (Tarlock 1995).

There are some measures available within the current framework that may prevent serious conflicts. The private property nature of water rights could serve to move water to more valued uses through free market mechanisms. Transfer of water rights, with the requirement that the rights of other users are not diminished, is allowed in all western states (Bates et al. 1993). In Idaho, out-of-state transfers are restricted by several other requirements concerned primarily with protecting water supplies to meet present and anticipated demands (*Idaho Code* § 42-401). This likely restricts the functioning of a free market.

Idaho law (*Idaho Code* § 42-1761) provides for water banking, which permits stored water to be leased. Operational responsibility is assigned to the Idaho Water Resource Board. As the name implies, a water bank operates by allowing water rights holders to store their water and then lease it to other users. In effect, this creates a market incentive for water users to conserve water because income can be generated by leasing the saved water. This is an important consideration in the case of salmon conservation in Idaho, and is discussed

in **Appendix B**, and summarized here.

Prior to 1992, water banks could only enter into short-term leases within the state. In 1992 the Idaho legislature authorized water banks to enter into short-term leases out of state if a number of restrictive criteria are met. Water that had previously been available at \$2.75 an acre foot was now worth \$20.00 to BPA to run through Idaho Power Company dams and help flush juvenile salmon to the ocean. Irrigators who had counted on leasing available water at \$2.75 may now find themselves priced out of the market although preference exists for irrigators in the rental pool rules (F. Sherman, review comments). Salmon advocate Ed Chaney said that a water market, created by ESA protection of salmon, would make money for irrigators. Instead of taking water when it is needed for irrigation, federal officials could lease surpluses when available (Barker 1993).

Other potential measures that operate within the framework of prior appropriation include expediting water transfers, while requiring a certain percentage of the water transferred be dedicated to remain instream. Such a program is currently in operation in Oregon (Bates et al. 1993). A similar program was undertaken by the city of Los Angeles and the Imperial Valley Irrigation District. Los Angeles financed improvements in irrigation facilities and practices in return for the use of the 100,000 acre feet of water per year that were expected to be saved by the improvements (Bates et al. 1993).

Another such program might include having BPA finance the cost of improving the efficiency of irrigation carrying and delivery infrastructure and allowing the saved water to be available to BPA for salmon and hydrogeneration (Barker 1993). However, in the upper Snake River, most water loss from delivery systems ends up as aquifer recharge, thus "saved" water for flow augmentation for salmon must come from the consumptive portion of water diversions (F. Sherman, review comments).

Other creative market-based solutions could be developed. However, a market-based approach may not lead to the most socially desirable uses of water. Bates et al. (1993, p. 178) observed that changes in western water



law should be guided by a water ethic "rooted in a set of principles that reflect westerners' core values and concerns." They suggested three fundamental principles that should guide changes in water policy: conservation, equity, and ecology (Bates et al. 1993).

### Conclusions

Does the ESA mean a shift in management control? Yes. The needs of protected species come before any other land and resource management consideration. This does not mean all activities must cease permanently, but those that may imperil the protected species must cease until the land or resource manager obtains permission from the Service if there is any doubt concerning the welfare of the species. As a result of the ESA, all manner of federal projects may need to be modified to accommodate the needs of threatened or endangered species. State and private operators requiring federal permits also need

to obtain clearance from the Service. The activities of landowners who do not require a federal permit will find it necessary to obtain one if their land provides habitat for a protected species and their planned activities may "harm" the species or its habitat. Some management control is thus ceded to the Service, acting in behalf of the species protected by the ESA.

The issue then becomes, if a regulatory agency (in the case of ESA, the "Service") makes a decision that causes the loss of some economic value, should the property owner be compensated for that loss? Current jurisprudence suggests that if all economic value is foregone, then perhaps a constitutional "taking" has occurred, and the property owner must be compensated. This is an issue determined by courts on a case-by-case basis, and no court has ruled in favor of a property owner with a complaint stemming from the ESA.

### Question 11. Can the ESA be modified to work better?

Compared to some other states, Idaho has only a few ESA problems. That gives us an opportunity to prevent additional species from becoming endangered thus avoiding further conflicts and setting a standard for other states to strive for (Scott, review comments). Idaho has some of the last large-scale remnants of American wilderness and the marvelous creatures that inhabit such areas. Only a few states have more of their land in the National Wilderness Preservation System than Idaho does (MacCracken et al. 1993). Many undeveloped lands not in the Wilderness System contain economic resources of value to humans. Many lands already developed also impact the natural world.

The ESA requires consideration of how economic development will impact denizens of the natural world, and accommodation of their needs and mitigation of the factors that might cause their endangerment. The ESA may be a "tough" law (Hunt and Irvin 1992, Thomas 1993, Brown 1994, Barker 1995), but it has some flexibility. By learning how to use that flexibility (see Question 12), several ESA implementation problems can be improved. This chapter suggests that although there is popular support for the ESA, its implementation presents substantial problems.

One conclusion seems inescapable. The ESA is more important as a public policy statement of our nation's evolving attitude toward nature than it is an effective way to save fish, wildlife, and plants from extinction. For more than twenty years public policy has protected from extinction all species of plants and animals (except certifiable insect pests) to the extent possible, once they have been added to the protected list. In spite of these efforts, one listed subspecies of sparrow (and at least one population of unlisted salmon) have become extinct in the U.S., some species exist only in zoos, and thousands of species await formal listing. Many ESA observers believe a broader ecosystem-based approach should complement the current focus on individual species, but the ecosystem approach has not yet been designed, and is only in the formative stages (see Noss et al. 1995). Legal battles

and confrontations dominated species conservation during these past two decades, but perhaps the next major advances may come through incentives and cooperation (Fischer et al. 1994).

Efforts to resolve the current ESA issues exemplified by the spotted owl, grizzly bear, gray wolf, and Pacific salmon—but by no means limited to these species or this region—may strike an acceptable balance between ecology and other societal goals. If not, the policy can be changed, or special cases can be handled as such while the policy remains intact.

Some observers refer to the ESA as an "absolute mandate" (Kohm 1991, Yaffee 1991, Coggins 1991, Barker 1993) with a set of immutable "commandments" (Coggins 1991). But as a public policy, the ESA is not carved on stone tablets, nor is any other law of our land. The ESA is a somewhat flexible policy statement committing the nation to protect biodiversity. The Act allows the consulting Service agencies some latitude in determining which populations of which species are to be protected and where and how they are to be protected. However, some attempts to moderate the economic impacts of species protection have been circumscribed by litigation. Using the existing provisions of public policy, interest groups and courts forced the FWS to list the northern spotted owl because they believed that the biological data supported listing and that political pressure had led to it not being listed. Interest groups have forced the salmon issue with the NMFS.

Congress built some provisions for economics into the ESA as a check and balance, but the mechanisms do not work well (see Question 13). Congress has chosen to bypass the ESA in at least three cases—the snail darter in 1978, the California sea otter in 1986, and the Mount Graham red squirrel in 1989. Congress may choose to resolve other divisive endangered species issues—including the salmon (see Appendix B)—through negotiated settlement, and, if needed, legislative action.

Is a radical overhaul of the ESA necessary? That depends on what radical means. Rather than try to define it, this chapter leads up to suggestions that modifications of the habitat

protection and recovery processes would make the Act work better, with details following in the remaining five chapters. Apparent conflicts between ecology and other societal goals will continue to cause problems with implementation of the ESA as long as we have such a policy. But these problems can be worked out. It takes a perspective that balance is necessary. We cannot save all the plants and animals everywhere, but we cannot carelessly exterminate them, either. Where is the balance? We'll find out soon enough where it is in the public policy arena, and we will all need to be satisfied that the balance is a fair one. That is a tall order and may require some compromise of interests.

In a comprehensive book-length analysis of the ESA, a political scientist said "The protection of biological diversity raises fascinating economic, social, political, and institutional issues that will not soon fade" (Tobin 1990, p. vi). This chapter explores these issues in the light of the current debate over ESA reauthorization, with an eye toward potentials for reform. The issues are many. Conservation biologists, economists, other scientists, and the general public have much to contribute to their resolution.

Criticisms of the ESA span a large continuum. At one end, some believe the Act overprotects and is an example of ecologists "crying wolf" (Mann 1991, Budiansky 1993), and discuss biodiversity as an environmental luxury or "earth worship to the point of idolatry" (Krauthammer 1991). At the other end, some conservation biologists believe it underprotects and leaves many species in an "extinction vortex" (Gilpin and Soulé 1986). Such a wide polarity of opinions seems to be characteristic of endangered species issues (Tear et al. 1995).

In **Appendix D** we use controversies about grizzly bear recovery in Idaho (see MacCracken et al. 1994) to illustrate several shortcomings with implementation of the ESA. Some people question the need for listing and recovering distinct population segments of grizzlies, others question whether established measures of population status are adequate to either establish or assess recovery goals, and others question land-use changes enacted by federal agencies responsible for grizzly bear

populations and their habitat.

To relieve these and other problems, some people are calling for changes in the ESA itself. Reauthorization debate in Congress provides that opportunity. This chapter focuses on the general issues in ESA reform.

### The Fundamental Problem

Most imperiled species present problems that are complex, multi-dimensional, and interact with one another. Efficient and effective recovery policies cannot be identified and implemented until the policy problems are adequately defined and put into context (Dery 1985, Clark et al. 1991). Problem definition is a major component of policy analysis (Laswell 1971, Cabbage et al. 1993) and perhaps the most important part. What is the problem with ESA species conservation? That is, what problems must protection and recovery efforts overcome? In a word, people. This is the case with all endangered species issues; indeed, it is why we have the Endangered Species Act.

In the broadest sense, protection and recovery are hindered by increases in human populations, globally and nationally as well as within and immediately surrounding designated recovery zones. The Northern Rocky Mountains and Pacific Northwest are two of the fastest-growing regions in the United States, resulting in more people in and around habitats for imperiled species. Large tracts of private farms and ranches have been and will continue to be subdivided for homesites and developed as shopping malls and industrial sites. These real estate developments increase land values that in turn may preclude opportunities to devote some of these areas to wildlife conservation, either as special management areas or possibly as ecosystem linkage zones. Along with more people comes the increased demand for resource use on public lands, including a variety of recreation activities. In the future, the desire to develop and use public and private natural resources can be expected to increase as the human population increases. All of this constrains the ability of lands in the region to support imperiled species.

Some argue that the focus on single species

protection inevitably results in expensive and often futile "emergency room" efforts. Others argue that ESA prohibitions are too extreme, too costly, impinge on personal freedom, and threaten the economic survival of human communities that depend on the products of ecosystems required by other species.

It is unlikely that the central purpose of the ESA, the conservation of species in danger of extinction, will be altered during the current reauthorization. If President Clinton's proposed management directives for the federal forests west of the Cascade Range can be taken as an indication of direction, it is likely that endangered species, and the ecosystems on which they depend, will receive greater protection. It is also likely that provisions designed to mitigate the negative economic impacts of this protection, particularly for private landowners, will be advocated. Some have suggested that the implementation of ESA prohibitions that limit the actions of private landowners constitutes a "taking" of private property rights and as such should be compensated by the federal government. "Takings" legislation has been proposed in the 104th Congress.

Building economic incentives into the ESA has been advocated by a variety of interests. Concern with the economic impact of ESA prohibitions on private landowners is reasonable, given that 70% of the land in the United States is privately owned. Although the ESA is fairly effective in protecting species on federal land it does not work well on private land (Fischer 1993, Fischer et al. 1994). According to the General Accounting Office (US-GAO 1994), more than 90% of the listed species as of May 1993 have some or all of their habitat on nonfederal lands. About 73% of the listed species have more than 60% of their total habitat on nonfederal lands, and about 37% are completely dependent on nonfederal lands for their habitat (US-GAO 1994). Building economic incentives into the ESA is advocated by the Defenders of Wildlife (Hudson 1993, Fischer et al. 1994), a citizen conservation group that has been instrumental in forcing strict compliance with the intent of the ESA.

The attempt to recover isolated populations of species abundant elsewhere—such as gray

wolves, grizzly bears, and salmon—illustrates both the noble purpose of the ESA and its shortcomings. The ESA takes a reactive, crisis-situation approach to saving imperiled species. This can be a difficult and costly strategy, especially when it is directed at distinct population segments of species that are threatened or endangered at the edge of their current range but abundant elsewhere. Grizzly bears, for example, test the compatibility of human needs with those of other species to an extreme, because the bears require space of a particular quantity and quality. The reason why populations of grizzlies in the lower 48 states are imperiled is because of human-caused mortality and land development that has fragmented grizzly habitat and driven the remaining bears into relatively undisturbed but isolated pockets. The same can be said of gray wolves. Salmon recovery shows how limited human knowledge is, and tests the limits of human willingness to modify current ways of life to accommodate organisms of undeniable economic, cultural, and aesthetic value.

As Smith (review comments) put it, the central problem with ESA is that we are only beginning to appreciate its consequences. Rather than a limited number of identifiable species, we increasingly seem to be faced with an unlimited number of genetically distinct populations. Rather than being able to identify select habitat components within the current range necessary for protection of a particular species, it appears that habitat requirements for imperiled species frequently require vast undisturbed environments far in excess of land already dedicated to preservation. Thus the challenge of ESA reauthorization is whether the social and economic costs are worth the aesthetic, scientific, and ethical benefits, and whether those benefits can be secured more efficiently and fairly. The answer to the latter will have much to say about the answer to the former (A. Smith, review comments).

### The People Speak

Journalists have some influence on public opinion, which in theory helps to shape public policy. A copy editor for the Spokane *Spokesman-Review* published an opinion piece

titled, "No compromising on Endangered Species Act: destruction of species imperils mankind." The message has many points of support, and many supporters:

We have radically altered the natural landscape and are tinkering with the delicate mechanisms of nature in ways driven more by financial opportunity than by consideration for the biological world. The first rule of tinkering is to keep all the parts; we violate that rule at our peril.

Apart from abstract arguments for our long-term survival, there is a practical, immediate need to protect existing species: They are the best stock of drugs and potential medical cures we have.

Furthermore, the United States ought to set an enlightened example to the rest of the world as a nation that it is wise enough to put our long-term interests ahead of short-term benefits.

We simply need to have the resolve to impose these restrictions upon ourselves with the knowledge that our sacrifices today will allow future generations to reap the benefits of a fully stocked genetic system. (Springer 1991).

Two weeks later, the same newspaper responded with an editorial titled, "Endangered Species Act ignores the big picture." It reflects the other side of the coin of public sentiment for endangered species in the Pacific Northwest:

[B]efore the Charlie Lunchbuckets of our society give up their jobs and way of life for the sake of obscure owls, minor salmon runs and other esoteric causes yet to be embraced by the antisocial litigators of the environmental elite, Charlie and his pals should demand that the Endangered Species Act incorporate greater attention to balance, common sense and the mitigation of adverse effects upon humans. (*Spokesman-Review* 1991).

Following are two opposing view points on the ESA: first, from forest products industry trade association spokesmen (Heissenbuttel and Murray 1992), and second, from National Wildlife Federation representatives (Hunt and Irvin 1992). The viewpoints from these two organizations are characteristic of the two opposite sides in ESA discussions. Their arguments are presented here without commentary as point and counterpoint.

**Point: ESA Obstructs Economic Activity.**

Heissenbuttel and Murray (1992) agree with Rohlf (1991) that the ESA is "a troubled law." Because the Act defines species to include subspecies and distinct population segments, activists are able to block economic activities in targeted geographic areas where subspecies, or populations of otherwise abundant species receive ESA protection. They feel some remedy is necessary here. They also feel some other areas require a remedy.

The ESA requires that a listing be determined solely on the "basis of the best scientific and commercial data available." Consideration cannot be given to whether the listing will do any good, nor is there a "public interest" test to temper the decision. There are no standards in the ESA to determine what constitutes the best scientific or commercial data, nor is there a requirement that listing data be subjected to peer review.

After listing, a recovery plan is to be prepared describing the steps federal, state, local agencies, and private individuals should follow to assist in a species' recovery. Roughly half the listed species have had a recovery plan completed, and even in those cases where a recovery plan exists there is no assurance that a landowner in compliance with the plan will not be sued for a taking.

Although critical habitat is to be designated for each species listed, the FWS and NMFS frequently invoke the "extraordinary circumstance" provision of the Act to evade this responsibility. Because economic effects of designating critical habitat are to be considered, failure to designate critical habitat allows these agencies to further ignore the economic impact of a listing.

The consequences of a listing are too pervasive. No federally authorized action of any kind may "jeopardize" a listed species. This has been interpreted to include federal actions on private lands, leases, and federal permits. Prohibitions on takings are too broad, and the term take has been aggressively defined by the FWS to include any land-use action that adversely modifies habitat and thereby injures just one member of a listed wildlife species.

The exemption process (ESA §§ 7(g) to (p)) is the ESA mechanism for which actions found to "jeopardize" a species may proceed. According to Heissenbittel and Murray (1992), it is too restrictive. The Endangered Species Committee is composed of six cabinet level individuals and a presidentially-appointed representative of the affected state, and has been convened in only three cases since its creation in 1978. If an exemption is granted, it is subject to mitigation and enhancement paid for by the applicant.

Taking of a species can be demonstrated statistically by documenting a long-term decline of the species in all the territory it occupies and thus is not necessarily related to the landowner's property.

Private landowners may receive "incidental take" permits, which provide immunity to penalties for taking a listed species, only by submitting a Habitat Conservation Plan (HCP). This process amounts to an unprecedented extension of the federal NEPA requirements to private property, may cost millions of dollars, requires the private landowner to support basic research on the species, dedicate much of their land as habitat for the species, and acquire additional land to be used as habitat.

Heissenbittel and Murray (1992, p. 16) concluded that the ESA has "unacceptable human costs" and is "failing even to accomplish its intended objective."

**Counterpoint: ESA is Tough but Necessary.**

In the same issue of the *Journal of Forestry*, Hunt and Irvin (1992) of the National Wildlife Federation argued that the ESA needs to be tough to address the tough problems it was intended to correct. They argued that opponents of the ESA—such as Heissenbittel and Murray, one may presume—rely on four myths to support "weakening" of the Act.

**Myth #1:** The ESA is a failure, as evidenced by the small number of species that have recovered to the point where they can be removed from the list. **Fact:** The ESA has been successful in stabilizing the condition of 238 threatened or endangered species. It is unfair to evaluate success as removal of a species from the endangered list. Listing is an "emergency room" operation and the success of emergency room procedures is not whether

the patient fully recovers, but by whether their condition is stabilized or improved so that with further care recovery is possible. The condition of 41% of listed species in 1992 was either improving or stable.

**Myth #2:** The ESA fails to consider the socioeconomic effects of measures to conserve species, elevating the protection of plants and wildlife above human needs. **Fact:** By protecting species that may contain the cure for cancer or provide a stable food supply for an expanding world population, the ESA protects the long-term interests of humanity. Even without considering long-term benefits, the ESA is replete with requirements for balancing the costs of conservation.

In only one area is consideration of economic and other nonbiological factors precluded. Only the determination to list a species is based solely on biological considerations. Economics are considered in the designation of critical habitat; the Act allows special regulations for threatened species to accommodate economic activities; reintroduced species can be designated as "experimental," allowing greater flexibility in management and thereby alleviating landowner concerns; "incidental take" permits can be, and are, issued that allow development to proceed once the landowner files a Habitat Conservation Plan; if the FWS or NMFS issues a "jeopardy" opinion under section 7, the Service is required to provide the action agency with reasonable and prudent alternatives; finally, if no reasonable or prudent alternative can be found, the Endangered Species Committee (or "God Squad") can be convened to review the project and grant an exemption if warranted.

**Myth #3:** The ESA is bringing development to a grinding halt across the country. **Fact:** Of the 48,000 federal actions reviewed under the ESA between 1979 and 1986, less than one-half of one percent were found to "jeopardize" listed species, and only 15 projects were canceled. Of the 73,000 actions reviewed between 1987 and 1991, less than one half of one percent were found to "jeopardize" listed species and only 19 projects were canceled. Clearly the ESA is not a serious impediment to development.

**Myth #4:** The ESA is "taking" private

property without just compensation in violation of the Fifth Amendment to the United States Constitution. **Fact:** No court has found that the ESA has resulted in an unconstitutional "taking" of private property. The availability of various permits and procedures to resolve use of property and species conservation minimizes the likelihood of such "takings".

Hunt and Irvin (1992) recounted five recommendations unanimously endorsed by National Wildlife Federation delegates at their 1992 annual convention:

1. Streamline the listing process to expedite species protection.
2. Improve implementation of the ESA's requirement for designated critical habitat.
3. Achieve greater ecosystem protection through enhanced planning for recovery.
4. Ensure adequate funding for authorized conservation activities.
5. Strengthen the enforcement provisions.

**Public Opinion.** How does the public feel about the ESA? There is unquestionably strong support for the ESA, but recent nationwide opinion polls (Landers 1995, Roper Organization 1993) and one from Idaho (Trillhaase 1995) reveal a preference from the public that species conservation needs to be balanced with economic considerations.

Public opinion polls indicate a much broader middle ground than the polar opposite views of editorial writers presented in the opening section of the chapter. In other words, the public overwhelmingly rejects the notion that we should not try to protect imperiled species, and a majority of the public rejects the notion that all species must be saved at all costs.

**National Polls.**—In a poll conducted for the National Wildlife Federation in December 1994, a random sample of 1,201 people who voted in the November elections were contacted and asked a variety of questions about environmental laws. On whether the "government should maintain Endangered Species Act rules," 57% preferred this choice to the 32% who preferred the alternative choice to "relax ESA rules" (Landers 1995).

The conclusions drawn from the 1993 Times Mirror Magazines National Environmental Forum Survey (Roper Organization 1993) indicated that Americans are strongly in favor of conservation, but clearly recognized the

need to consider the cost issue when government weighs various policy options. These findings relate to species conservation policy under the ESA, because public opinion of the Act "exemplifies increasing pragmatism" as indicated in the following quotes from Times Mirror poll findings:

- Three-quarters of Americans are conservationists, who believe that natural resources and wildlife can be protected while also being used for economic and public benefit, as opposed to preservationists, who believe restricted development and public use is the only way to protect wildlife and natural resources. And conservation gained ground as the preferred way to respond to environmental problems between 1992 and 1993.
- The public still rejects the notion that environmental protection and economic development are mutually exclusive goals; indeed, the public is becoming increasingly more pragmatic as the debate continues. Nearly 7 in 10 think that environmental protection and economic development can go hand in hand, compared with 6 in 10 last year. Only 2 in 10 say that we must choose between the two.
- A majority (55%) agrees that our endangered species policy "should take costs into consideration," up five points since 1992. Slightly more than one-third of Americans (35%) say that endangered species of plants, animals and insects should be saved "regardless of the costs," also similar to last year.
- When asked if they thought "laws and regulations for [specific environmental policies] have gone too far, not far enough, or have struck the right balance," 16% of the public thought the ESA had gone too far, a greater percentage than with any other policy (Table 11-1). (Roper Organization 1993).

Another more narrowly focused national poll revealed strong support for endangered species protection: "61 percent of the respondents agree threatened and endangered species in U.S. public forests and grasslands should be protected even if that results in a negative economic impact for some" (Sonner 1995c). This poll was conducted by the U.S. Forest Service, and reveals a public preference for strong species conservation activities on public lands. Like the National Wildlife Federation, the Forest Service did not ask the "regardless of costs" question asked by the Times Mirror poll. The Forest Service did ask

Table 11-1. Responses of the American public in 1993 to a telephone survey question on the "balance" in five environmental policies.

Question: Thinking now about some specific areas, at the present time, do you think laws and regulations for [READ ITEM] have gone too far, not far enough, or have struck the right balance?

ITEM	GONE TOO FAR	NOT GONE FAR ENOUGH	STRUCK RIGHT BALANCE	DON'T KNOW
a. Fighting air pollution.....	4%	71	19	6
b. Protecting wild or natural areas.....	8%	54	28	10
c. Protecting endangered species of plants, animals and insects...	16%	48	27	9
d. Protecting wetland areas...	9%	49	20	21
e. Fighting water pollution...	3%	77	14	6

Source: Roper Organization (1993).

a question about "a negative economic impact for some," who were not identified. A forestproducts trade association critic of this poll felt respondents "don't understand the difference between national forests and national parks" (Sonner 1995c). The bottom line of the Forest Service survey, however, is clear:

- The public does not seem willing to sacrifice the health of the forests in order to produce consumer goods or increase profits to private companies.... [A]ny shortsighted excesses of the past will not be permitted in the present and the public expects the federal government to be responsible for conserving the forests for those yet to be born. (Sonner 1995c).

The opinions of these 500 U.S. residents—about one-fourth from the Northeast, one-fourth from the Southeast, with the rest from the West, Midwest, Mountain and Southwest regions—may or may not represent Idaho opinions about national forests. No other state has as much (39%) of its land managed by the U.S. Forest Service (Oregon ranks second with 25%).

**Idaho Polls.**—A recent poll of 751 Idahoans, conducted in February 1995 for the Boise *Idaho Statesman* (Trillhaase 1995),

revealed solid support for doing more to protect endangered species (38% of respondents), but even stronger support (48%) for doing less; 11% thought we should do about what we do now, 3% were not sure. Responses to two willingness-to-pay questions regarding protection and restoration of endangered species revealed that to help save salmon or wolves, 40% of the respondents would be willing to pay somewhat higher taxes, or \$5 per month more for electricity or 5 cents more for a pound of potatoes. Most people, however, would not be willing to pay more taxes (58%) or higher electricity bills or potato prices (59%) to help salmon or wolves (Trillhaase 1995). These results show somewhat more concern about the costs of endangered species protection than other Idaho polls.

Public opinion polls conducted in 1992 and 1993 indicate that the search for balance between economic and ecological considerations is important to the public. Boise State University's Survey Research Center conducts "The Idaho Policy Survey" annually, and includes selected questions on the environment, varying them each year. The following findings revealed a split between



support for considering economic factors in environmental policy, including endangered species:

- In 1992, 53% favored amending the Endangered Species Act to take into account economic factors when deciding to list an animal species as endangered.
- In 1993, 42% of Idahoans surveyed agreed or strongly agreed with the assertion that the state should continue environmental protection regardless of the economic costs; 53% disagreed or strongly disagreed (J. Freemuth, pers. comm.).

In sum, polls in Idaho show strong support for ESA efforts, but that support is tempered with a pragmatic view that costs are important.

### Social and Political Realities

How can human considerations other than the recognition that non-human species have value be put into the ESA without compromising its basic intent? Tobin (1990) observed that most social scientists have totally neglected the ESA. Why is that, when a prominent conservation biologist (Soulé 1985) recognized "the dependence of the biological sciences on social science disciplines"?

There are two obvious reasons why up until recently the protection of biological diversity has been left to biologists. First, except for localized cases of conflict with economic development—including the snail darter, orange-footed pearly mussel, Hawaiian palila, and many others—the concept of species conservation either met with general acceptance or indifference. Recently, interest group litigation and judicial decisions have forced the listing and protection of species that raise substantial economic and social questions that go far beyond local impacts and affect multi-state regions and major industries. Only now are we beginning to see what the costs of protecting biological diversity entail, and policy-makers face two questions: Is it worth it? Where do we draw the line?

From the economic development perspective, the ESA may be the worst environmental law ever passed. It allows citizens to file petitions to protect species—and the ecosystems upon which they depend—for any conceivable reason. It allows biologists a

great deal of latitude in determining what population segments of what species need to be protected. It produces years of uncertainty while the policy process tries to summon a response. From a species conservation perspective, the ESA may be the best law possible. Congress clearly recognized that species "have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation" (ESA Sec. 2(a)(1)). The law authorizes actions that may require some sacrifice of human desires.

Second, until recently no one knew what "biodiversity" meant. Although the basic definition—the variety of life and its processes (Keystone Center 1991)—is understandable, it is difficult for many people to comprehend the importance of the need to conserve biodiversity. Recent developments with spotted owls, salmon, wolves, and other listed species, as well as those proposed for listing, have many people wondering about the purposes and costs of species conservation. As the ESA is in the center of the political arena once again, the political scientist Tobin's (1990) basic observations about political reality are worth remembering:

Political systems place the burden of proof on those who want to change the status quo. Those favoring change must produce persuasive ... evidence that a problem exists, ... especially when change threatens the well-being of those who profit from the status quo.

A sense of urgency about extinction ... is not yet widely shared in the political community or among the general public.... [S]cientists have not communicated successfully the adverse effects of past extinctions,... and they are woefully uncertain of the likely consequences of projected extinctions.... [I]t is difficult to communicate whatever information is available ... [because] the issues are as complex and little understood as any modern society has ever faced.

[S]cientists and conservationists have been warning of an impending crisis of biological diversity for at least twenty years.... [W]hen nothing seems to happen, scientists lose their credibility and are labeled as eccentric, publicity-seeking doomsayers.

[T]he conclusion [is] that endangered species do not now possess the attractive features to make them prime candidates for sustained

political attention,... [and] needs for resources, authority, and political capital may quickly exceed the political system's desire, capacity, and willingness to provide them. (Tobin 1990).

The social perspective has the last word in this subsection. Lee (1991), a resource sociologist, summarized the importance of the social perspective:

Concerned citizens, especially in a democracy, will not accept resource management decisions that disrupt their way of life, including their livelihood, recreation pursuits, and sense of community. This social scientific fact is often overlooked by proponents for preserving biological legacies, just as it was overlooked by proponents for maximizing the economic value of forests. Biological legacies cannot be maintained unless social and cultural legacies are also maintained. (Lee 1991).

Three years later, Professor Lee (1994) pulled no punches on the need to consider social concerns in natural resource policy. He said continued reliance on moral exhortation to change the way things are carries the high cost of reduced political freedom, and cannot solve environmental problems. Nobody wants such a lose-lose situation. Lee said we are not yet hopeless victims of a society controlled by the "politically correct." We are strong people with proud traditions, and should assertively take pride in who we are by taking full responsibility for the environmental and ecological problems we create. Affirming freedom and belief in ourselves will best prepare us to face new challenges we face in protecting and managing our environment (Lee 1994). These exhortations are similar to those of biologist E.O. Wilson (1988) presented in the **Introduction**.

**Recent Political Activity.** There is clear recognition in the nation's capital that the ESA is causing problems. In 1993, Bruce Babbitt, Secretary of the Department of the Interior, said "Everyone agrees we're going to need to revisit the concepts of the Endangered Species Act" and determine if we can't find some way to look at ecosystems on a multi-species basis and ask how it is we can take reasonable steps to "deal with the economic tradeoffs" before a crisis erupts. The idea is that both conservation and business interests can be

better served by negotiated settlements that plan the future of entire ecosystems before any individual species are endangered (Stevens 1993).

Two bills passed by the U.S. House of Representatives in February 1995—The Risk Assessment and Cost-Benefit Act and the Regulatory Transition Act—would, if passed into law, require the FWS to remove 15 recently listed species from the threatened and endangered lists, and to halt consideration of 119 others in different stages of review (Bedell 1995). These two bills would make it more difficult to implement the law, according to Michael Bean of the Environmental Defense Fund (Bedell 1995).

President Clinton's administration does not think the Act should continue to be implemented as it is. The ESA "has caused difficulty for some small landowners" who have found protected species on their land, said Interior Secretary Bruce Babbitt at a news conference in March 1995 announcing new proposals by the administration to modify the Act (Hebert 1995). The proposal included the following provisions:

- Exempting owners of 5 acres or less from enforcement actions,
- Requiring tougher guidelines based on broader scientific review before listing a species,
- Allowing states to assume a lead for developing species recovery plans on non-federal lands, and
- Simplifying implementation of the law and allowing for greater flexibility such as partnerships with private organizations for species protection. (Hebert 1995).

Since then, several bills have been introduced in the Congress to modify the ESA.

## Conclusions

The two keys to making the ESA work better are 1) learning how to use the existing flexibility in the Act, and 2) developing cooperative relationships between different agencies, and between agencies and the public.

The ESA, designed to temper economic development with adequate concern for ecological considerations as they affect other organisms, has in the view of some tipped too

far from the balance point. How you may view that imbalance depends on where you are standing.

Interest groups with opposing values vie with each other to change natural resource policies to support their positions (Kellert and Clark 1991). Although federal agencies are required to listen to these competing views of how natural resources should be managed, their own professional value and bureaucratic cultural systems are sometimes disproportionately represented in policy decisions due to the lack of a public consensus on management directions or action (MacCracken et al. 1994).

The facts regarding interagency consultation under section 7 of the ESA show a very low percentage of projects (less than 1%) are halted due to species conservation. This tends to mask the importance of conflicts that do arise. If the project that is halted is the one you want to see go forward, statistics mean nothing.

Interagency consultation applies only when non-federal landowners have some permit or funding connection to federal agencies. Some state and private projects are halted by the no-take prohibition in section 9 of the ESA because the definition of "harm" is defined by the FWS as including significant habitat modification. These foregone state and private projects are not reflected in consultation statistics.

On a more local level, it is one thing to say that fewer than one percent of the livestock in the vicinity of a wolf recovery area are likely to be killed and eaten by wolves, as the statistics in Minnesota and Canada reveal (Fritts 1990). Each rancher in the vicinity of wolf recovery zones in the Northern Rockies fears that her calves will be the ones selected by the wolf (Wise et al. 1991).

Statistics aside, at the heart of ESA controversy lies the same controversy we have been struggling with for at least a century in

this nation. What is the relationship of humans to other species? In other words, what is the role of humans in nature? Some people—call them anthropocentric or human-centered if you like—believe humans can manage the impacts of their activities on the non-human world and that human knowledge and technology can make up for any unforeseen consequences of their actions. Other people—call them biocentric or ecologically-centered if you like—believe humans are ignorant about the nuances of the non-human world, technology cannot correct all our mistakes, and we are far along the path to destroying the planet.

The ESA is a remarkable policy in that it abandons the human-centered approach and places ecological concerns uppermost. Some people believe that is morally wrong, others feel just the opposite. What are the facts? We cannot destroy the environment we depend on, because we will doom our own species by doing so. Yet we humans do have needs, and fulfilling those needs involves allocating resources to various purposes. These choices are made collectively in our democratic society. The choice we made 22 years ago by passing the ESA into law is being revisited now, and the elimination of resource allocation choice mechanisms mandated by the Act is what some of the fuss is about. This important issue is revisited in Question 13.

Regardless of any particular value stance, it is clear that the ESA could use some attention. It could work better than the way things seem to be going. According to Coggins and Glicksman (1995), the ESA inspires litigation, enhanced by the possibility of a successful litigant recovering its attorneys' fees. The end result of litigation is a judicial decision affecting natural resource management. The adversarial proceedings in the judicial system create winners and losers. There might be better ways to approach the goal of species conservation.

**Question 12. Is there flexibility in the ESA?**

Addressing the Western Association of Fish and Wildlife Agencies, meeting in Sun Valley, Idaho, in the summer of 1990, Sen. James McClure (R-Idaho) said, "I think [the ESA] has enough flexibility and I think that will come out in time" (Associated Press 1990). This chapter searches for the flexibility in the ESA statute, how the Service uses that flexibility, and the cooperative agreement approach between federal and state government to attain species conservation goals. Economic considerations are often the centerpiece of debates about the ESA, and the additional flexibility that could come from economic analysis that some would like to see interjected into the Act is treated separately in Question 13.

First it is useful to define flexibility in the context of the ESA, and two related terms—authority and discretion. Authority is the scope of jurisdiction. For example, the FWS does not have authority to exempt a project from the ESA. Discretion is the range of free choice. Flexibility is the responsiveness to particular circumstances (A. Smith, review comments).

Smith (review comments) is of the opinion that the law as written does not provide consulting or action agencies with very much discretion. Tobin (1990) and Houck (1993) disagree. Smith (review comments) said the range of choice is narrow and decisions are circumscribed by relatively specific standards. Listing decisions must be biologically based. Economic factors can be considered in designating critical habitat only marginally (to permit reduction in critical habitat from that needed for recovery to that needed for survival). Federal agencies must avoid "jeopardy" or adverse modification of critical habitat without regard to economic or social consequences. No person may harm a protected species without a biological assessment (or a habitat plan) and "incidental take" permission (A. Smith, review comments).

Because agency discretion is narrow, continued Smith, there are sharp limits on the flexibility with which ESA may be implemented. Moreover, broad discretion

does not assure flexible implementation if an agency is determined to take a hard line. However, there is evidence that consulting agencies have generally sought to use their limited discretion to redesign projects rather than bringing them to a halt. Whether this degree of flexibility is adequate is, of course, a major policy issue facing Congress (A. Smith, review comments).

**Federal Agency Flexibility**

The ESA created a new role for the FWS as a regulatory agency, with a responsibility for ensuring no federal action, including any activity on federal land or any activity involving the use of federal funds or a federal permit, "jeopardizes" a listed species, and that no one takes a listed species. According to Opdycke (1993), a former FWS employee, the Service is not entirely comfortable with their "strange new role." His remedy is to give the FWS more personnel and financial resources.

The ESA gives the Service a difficult job, to be sure, and limited resources. The Act also gives the Service the power to write implementing regulations. ESA flexibility encompasses biological concerns, habitat protection, and recovery plans. It also allows the Service to enter into cooperative partnerships to allow others to engage in conservation activities, either in recovery plan implementation, or to manage candidate species that are tending toward listing to keep them from being added to the list.

More flexibility features are provided in the ESA for federal lands than for non-federal lands, unless they have a connection with a federal agency through permits or funding programs. The ESA gives some flexibility to landowners with a federal connection that landowners without it do not enjoy. Flexibility arises from the requirement for consultation to avoid "jeopardy," which means these landowners can get approval for an "incidental take" without going through the section 10 Habitat Conservation Planning process. Also there is the ability (albeit very limited in practice) for federal agencies to petition the Endangered Species Committee to exempt a project from the ESA.

**Listing.** The Service has some flexibility in the determination of which species, subspecies, and distinct population segments of vertebrate species will be listed based on the best available data, including scientific or commercial catch data. Eisner et al. (1995) called this discretion. In some instances the decision to list has been subjected to peer review, especially if there are conflicting data sets. In the future, all listings will be peer reviewed (59 *Fed. Reg.* 34270 and 34271 [July 1, 1994]).

Some of the listing flexibility arises in the identification of subspecies and distinct population segments. The FWS has some flexibility because the Act does not provide a definition of "distinct population segment." However, the agency has given this phrase a common-sense definition that focuses on whether the population interbreeds with other populations. Some observers feel that only full biological species should be listed; biologists counter with arguments about compromising genetic diversity and thus the evolutionary potential of the full species (NRC 1995).

Additional listing flexibility comes in the selection of geographic areas where listed species will be recovered, which is related to populations. For example, the FWS decided it is appropriate to recover grizzly bears in Idaho, Montana, Wyoming, and Washington, but not in Oregon or California, which features the grizzly bear on its flag. To the extent that one group of grizzly bears is reproductively distinct from another group, the two groups are "distinct population segments" that will be accorded protection under the Act if they are either threatened or endangered. In the case of grizzly bears, the recognition of distinct population segments provides flexibility because it allows population segments to be delisted independently of the status of the other population segments (US-FWS 1993a). This was not the case for grizzly bears under the original grizzly bear recovery plan, which stated that when the Yellowstone, Northern Continental Divide, and Cabinet/Yaak population segments met recovery goals, then all populations of the grizzly bear would be delisted (US-FWS 1982). Focusing on individual population

segments also provides the flexibility to tailor management guidelines and recovery programs to accommodate the unique conditions in each grizzly bear ecosystem (Mealey 1986, US-FWS 1993a).

It was made clear in the northern spotted owl case that the FWS cannot refuse to list a species on primarily economic grounds (*Northern Spotted Owl v. Hodel*, 716 E. Supp. 479 [W.D. Wash. 1988]) (see Coggins and Glicksman 1995, Yaffee 1994).

In the future, an ecosystem-level approach may provide some flexibility to not list a species in an area if the area is under a multi-species recovery plan.

As an agreement in settling *The Fund for Animals v. Lujan* lawsuit filed by conservationists to prompt the Service to accelerate the listing of species over the next 5 years, the FWS agreed to use an ecosystem approach to review listing petitions and candidate species. A multi-species, ecosystem approach to ESA listing will be complicated, but it may allow the Service to better assess the common nature and magnitude of factors causing endangerment in an area rather than to one species. It will also help the Service understand the relationships among imperiled species in ecosystems. This ecosystem approach may allow the service more flexibility in which individual species it lists. One result of the multiple-species approach may be more cost-effectiveness in the long-term than with a species-by-species approach, at least in river basins with a multitude of imperiled species (see, for example, Taylor et al. 1994). It is likely that this approach would complement rather than replace a single-species approach.

**Critical Habitat Designation.** The ESA requires the Service to designate critical habitat to the maximum extent prudent at the time a species is listed, unless it would not benefit the species or if insufficient data exist on which to base the designation.

The ESA as implemented has been mostly a listing and protection law and has not focused as much attention on recovery, which involves habitat and the potential for conflict over land-use regulation. Less than 15% of the listed species have designated critical habitat. The

reasons cited by Service officials on why so many species have not had critical habitat designated include: 1) critical habitat designations do not necessarily provide much benefit for a species; 2) compared with other ESA requirements, designating critical habitat is considered low priority; 3) additional biological and economic data necessary to make sound critical habitat determinations are difficult to obtain; and 4) critical habitat designations may expose species to collection or illegal taking by publicly identifying where they are located (US-GAO 1992).

Habitat protection is not completely ignored, however. The Service prefers to use the "no jeopardy" standard during consultation (Houck 1993). It is less specific than adverse modification of critical habitat (both are required under ESA § 7) and as currently implemented makes critical habitat redundant protection (Rohlf 1989). On both federal and non-federal lands, the Service has defined take to include "significant habitat modification."

**Consultation.** Interagency consultation on whether proposed projects cause "jeopardy" to listed species is one of the principal implementing mechanisms of the ESA. According to the General Accounting Office (US-GAO 1992), in the five-year period between 1987 and 1991 the Service averaged more than 3,000 informal and 400 formal consultations per year (Table 12-1). The Service found that proposed projects might cause "jeopardy" 181 times, which is about one percent of all consultations or nine percent of all formal consultations. Of the 181 "jeopardy" findings contained in the required biological opinion document, only 23 were without "reasonable and prudent alternatives." This is about one-tenth of one percent of all consultations, or one percent of formal consultations. The other 158 biological opinions finding "jeopardy" provided "reasonable and prudent alternatives" that would allow the proposed project to proceed. These alternative actions included modification of project design, adjustment in site location, and emission restrictions (US-GAO 1992). There is no data on how many of these 158 "jeopardy" projects the action agencies actually undertook following the "reasonable and

prudent alternatives."

These data indicate that the consultation process provides flexibility for federal projects to proceed, and are widely cited. So is a separate study conducted by the World Wildlife Fund (Barry et al. 1992) during the same period of time, with similar results. As Vaughan (1994) pointed out, commentators have noted that the FWS works with other agencies and private parties to find alternatives so that a "jeopardy" opinion does not have to be issued (Houck 1993, Irvin 1993). During consultations, the FWS has a "strong propensity ... to do whatever is necessary to rectify the conflict in favor of business" (Vaughan 1994).

Table 12-1. Number of ESA section 7 consultations, 1979-1991.

	Consultations	
	Informal	Formal
1979-1986 FWS	71,650	2,000
NMFS	788	248
1987-1991 FWS	15,470	1,806
NMFS	691	244
Total	88,599	4,298

Source: Williamson (1992), US-GAO (1992).

What these data do not reveal is the ESA's full effect on federal agency actions because they ignore the number of actions abandoned prior to or during consultation (Smith et al. 1993). Such data is nonexistent (Tobin 1990). Also ignored is the lack of practical field experience that some agency personnel who are involved in consulting have, which could be helped by agency in-service training (B. Wall, review comments). The FWS has instituted training programs (see Question 2).

**Endangered Species Committee.**—As a result of the snail darter/Tellico dam conflict and the Supreme Court's interpretation of congressional intent as protection "whatever the cost," Congress modified the ESA by creating an exemption process. A high-level committee—officially the Endangered Species Committee but now more widely known as the "God Squad"—was given authority to exempt a

project from the ESA:

The [Endangered Species] Committee shall review any application submitted to it ... and determine ... whether or not to grant an exemption from the requirements of [the above subsection on avoidance of jeopardy]. (ESA § 7).

The committee may be convened by the Secretary of the Interior (its chair) when there is an irreconcilable conflict between a development project and species conservation needs, and after an appropriate application for exemption has been filed.

The purpose of the committee is to decide whether a project has benefits that are more important than compliance with the ESA. These conditions must be met before an exemption may be granted:

- there are no reasonable and prudent alternatives to the agency action;
- the benefits of such action clearly outweigh the benefits of alternative courses of action consistent with conserving the species or its critical habitat, and such action is in the public interest;
- the action is of regional or national significance; and
- neither the federal agency concerned nor the applicant made any irreversible or irretrievable commitment of resources. (ESA § 7(h)(1)).

The "God Squad" might have been feared by environmentalists in 1978, but it has proved to be an essential political pressure valve (Yaffee 1991). Until the spotted owl situation in the early 1990s, the committee had been convened only once, in 1978, to hear two cases: the snail darter/Tellico Dam conflict in Tennessee and the less well known whooping crane/Grayrocks Dam conflict in Wyoming.

In the snail darter case, the committee unanimously concluded that reasonable alternatives to the Tellico Dam existed, and did not exempt the project from the ESA. The Tennessee delegation pushed special legislation through Congress to build the dam anyway, and President Carter reluctantly signed it. Fish were transplanted above the dam before it was completed and have established themselves successfully. Biological surveys have discovered additional snail darter populations in other streams, and the species was downlisted from endangered to threatened in

1984 (Tobin 1990, Yaffee 1991). In the whooping crane case, the committee voted to exempt the project from the ESA, but only after the applicants agreed to alter the project to mitigate its harmful effects and to establish a \$7.5 million trust fund to maintain and enhance whooping crane habitat (Reed and Drabelle 1984).

In 1990, an attempt to convene the committee to hear the spotted owl controversy was rejected. In September 1991, the director of the Bureau of Land Management requested that the committee be convened because of the postponement and likely cancellation of 44 planned timber sales on 4,426 acres of Bureau lands in Oregon. In May 1992, the committee exempted 1,700 acres of timber sales in two heavily timber-dependent counties, and upheld protection on the remaining 2,726 acres.

**Recovery Plan Preparation and**

**Implementation.** The Service is required to develop and implement recovery plans for listed species, unless a plan would not benefit the species. Progress toward recovery plan development has been slow (Table 12-2), but Service officials have stated that recovery planning has been receiving higher priority in recent years, and since 1988 the FWS had received increased funding for recovery purposes (US-GAO 1992).

Table 12-2. Species listed by the FWS for 3 or more years without approved recovery plans, through 1991.

Number of years listed without a plan	Number of Species
3	56
4	68
5	83
6	32
7	13
8 or more	<u>11</u>
Total	263*

\* 40% of the 651 listed species as of 1991. Source: US-GAO (1992).

The most important part of a recovery plan is the mitigation of "factors to be considered in

listing," which are the factors causing endangerment. Without doing that, the attainment of a species population level is meaningless. The Service has the flexibility to choose whatever conservation means it feels are appropriate. The Service has no responsibility to identify alternative means, nor their costs.

Although ESA requires the Service to "develop and implement" recovery plans, there are no deadlines specified. Consequently, the Service has the practical ability to delay the preparation of recovery plans for as long as it likes (A. Smith, review comments). As a result only about half the listed species have recovery plans. Given low funding levels, this flexibility seems necessary. For listed species for which recovery plans are written, the Department of the Interior's Inspector General estimated in 1991 that it would take 4.6 billion dollars just to implement the recovery plans over the next ten years. For the 3,800 or so backlogged candidate species, listings and recovery plan implementation would require billions more. The funding provided to the FWS was \$41.5 million in 1992, of which \$20 million was budgeted to recovery plan development and implementation (Vaughan 1994).

**"Incidental Take" Statements (§ 7) and Permits (§ 10).** Section 9 of the ESA prohibits any take of protected species unless authorized by the federal Service agency in charge of the listed species (see Question 1). The definition of take under the ESA includes to "harass, harm, pursue, shoot, kill, trap, capture, or collect, or attempt to engage in such conduct." If take occurs directly as the result of an activity designed to do any of these things to a listed species, it is considered a "direct take". If the take occurs during an activity not directed at a listed animal, it is considered an "incidental take." The Service may issue a permit for direct or indirect taking. A direct take permit can only be authorized for scientific research and enhancement of the listed species (Kiefer 1993). From a federal perspective, this flexibility feature allows development projects to proceed if the Service feels mitigation of the factor(s) causing endangerment is adequate.

**Section 7.**—The section 7 consultation process of the ESA is used for "incidental take" statements on federal lands or if a federal action is involved on non-federal lands. Assuming that the consultation process has resulted in a favorable biological opinion, the Service may issue an "incidental take" statement to the applicant that: 1) specifies impact of any "incidental take"; 2) specifies reasonable and prudent measures that the Service considers necessary or appropriate to minimize impact; and 3) sets forth terms and conditions that must be complied with by the agency or applicant to implement such measures (Gidari 1995).

On non-federal land where a federal connection does not exist, section 10 of the ESA may be involved. It provides the opportunity for state and private land managers to receive the equivalent of a biological opinion on whether a proposed action will place an endangered species in "jeopardy" prior to the commitment of resources. The intent of ESA section 10 is similar to section 7, which is to incorporate the needs of listed species into the development plan before resources are committed to an action that subsequently will be considered a prohibited take under ESA section 9. However, state and private land managers are not required to "conference" with the Service. It is the responsibility of the state or private land owner to provide the Service with adequate biological information for these agencies to determine if a taking may occur. Actions that may result in the "incidental take" of a listed species may be allowed to proceed if the state or private manager develops a Habitat Conservation Plan (HCP) that will offset or mitigate these incidental takings.

The process for obtaining an ESA section 10 "incidental take" permit is that the applicant must submit a Habitat Conservation Plan (HCP) with a permit application, specifying the following: 1) impacts that will likely result from taking; 2) steps to minimize and mitigate impacts and funding available to implement steps; 3) alternatives to taking considered and why alternatives are not being utilized; and 4) other measures that may be required by the Service as necessary or appropriate for purposes of the plan (Gidari 1995, US-FWS



1994c).

The "incidental take" permit shall be issued if, after opportunity for public comment, with respect to a permit application and related HCP, the Service finds that: 1) taking will be "incidental" to the purpose of the activity; 2) applicant will to the maximum extent practicable minimize and mitigate impacts of taking; 3) applicant will ensure adequate funding; 4) taking will not appreciably reduce likelihood of survival and recovery of the species in the wild; 5) applicant will meet any other necessary and appropriate measures required by the agency; and 6) the Service has received assurances as required that the plan will be implemented (i.e., an Implementation Agreement is executed) (Gidari 1995, US-FWS 1994c).

The FWS has reported more than 100 plans are in various stages of development (US-FWS 1994f). As of May 1994, permits for 28 HCPs had been issued since the option became available in 1982. Additionally, permits for 11 amendments to existing HCPs have been issued (US-FWS 1994f).

From a state fish and wildlife agency perspective, when a species in Idaho becomes federally listed, the state ought to be given an opportunity to participate in the planning and implementation of recovery actions, many of which complement state fish and wildlife management programs (Kiefer 1993). These opportunities may exist in ESA section 4 recovery planning and ESA section 6 cooperative agreements; however, said Kiefer (1993) flexibility seems to be more restrictive for section 7 take permits for listed salmon in Idaho, the jurisdiction of the NMFS (see salmon case example in Appendix B). From a non-federal perspective, the HCP "incidental take" process (ESA § 10) has some strengths and some weaknesses (Gidari 1995). To obtain an "incidental take" authorization, the state or private landowner may be subject to section 7 provisions or section 10 provisions, depending on whether a federal connection exists. The benefits of a section 7 "incidental take" statement obtained through section 7 consultation are: 1) it provides a lower threshold for approval than a section 10 permit; 2) statutory time limits to consult and issue a biological opinion; 3) an "incidental

take" statement is not subject to NEPA, however, the underlying federal permit or license is likely subject to notice and comment; 4) no implementation agreement is required, although one might be considered as a reasonable and prudent measure; and 5) measures and conditions cannot alter the basic design, location, scope, duration, or timing of the action (Gidari 1995).

The principal drawbacks to a section 7 "incidental take" statement are: 1) lack of precedent for non-federal entities; 2) potential for citizen suits; and 3) it may be viewed by some as an end-run around section 10 "incidental take" permits (Gidari 1995).

**Section 10.**—The section 10 HCP process is a species-by-species approach, requiring consideration of each listed species in the area, either in the permit or through continuing consultation, and the possibility of surprise listings in the future (Gidari 1995, Zender 1995). Required NEPA compliance is a major burden on the non-federal landowner (Gidari 1995, see US-FWS 1994c). Another weakness is the HCP may severely limit the ability to sell or acquire lands in the permit area without "re-opening" the permit by formal amendment procedures with public comment and more mitigation possible. A "no surprises" policy such as that conceived by Secretary Babbitt in late 1994 could overcome some of these weaknesses (Gidari 1995).

The burden of analysis and preparation of the HCP falls on the organization requesting the "incidental take" permit. This is a substantial burden, involving extensive inventory, planning, and subsequent monitoring. The non-federal entity also is required to prepare a draft of the environmental assessment, environmental impact statement and associated NEPA documentation (US-FWS 1994c).

The HCP process can be expensive, but costs vary considerably by project (J.M. Scott, review comments). The Murray Pacific experience (see Sidebar 12-1) presents the facts regarding an expensive HCP. Perhaps there are other examples of successful HCPs that were less expensive for the developers, but no evidence was encountered that the HCP is anything but expensive, and with only a few dozen approved, there are not many to choose

### Sidebar 12-1. The Murray Pacific Corporation Habitat Conservation Plan

The Murray Pacific Corporation is a closely held private tree farming firm with 54,000 acres in southwestern Washington. Three northern spotted owls have been seen on the land, although they do not nest there. The biological requirements for spotted owl conservation have tied up 42% of the company's acreage. After considering their options, the Murray family decided to develop an HCP to obtain an "incidental take" permit, and would likely do it again, even considering the expense. The firm has incurred expenditures of \$600,000 to perform the needed biological surveys, documents, written plans, and meetings. The cost of implementation is estimated to be \$44 million over the next 50 years, most all of that in timber revenues foregone by altering harvest schedules to accommodate the needs of juvenile owls in a dispersal corridor from one national forest habitat conservation area to the east of the private tree farm and one to the west. To take care of possibility of other species, Murray Pacific is in the process of expanding its HCP to include any other possible species, and this will double the cost to the company, making it a \$100 million dollar project over the first 50 years (Best 1995).

Murray Pacific's attorney said, "The HCP process works, but so do thumb screws" (Zender 1995). Zender said the process does have some strengths. The costs sound horrible, but the legal ramifications are important because they provide certainty to the firm. According to Zender, one good thing about a section 10 permit is you don't have to conserve the species. ESA conservation is a very broad standard that the company does not have to worry about because we obtained a "no take" agreement. If Murray Pacific had gone the section 7 route, the Service would be able to do a "jeopardy" test, which "gives them a second bite at the apple" (Zender 1995).

The HCP becomes a "contract" agreement between the government and the landowner. However, contracts are never totally closed, so what to do in the event of unforeseen consequences is a major consideration, especially with other species that may be on the land the Service doesn't know about today. The Service can agree that known species were covered, and a "rebuttable agreement" can be developed that puts the burden on the Service to prove the HCP won't work and to pay for modifications. It basically shifts the burden of proof and expense to the government for unforeseen consequences. It is also necessary to get a covenant under the HCP, which may detract from or add to the value of the property, depending on your point-of-view. Certainty is the greatest strength of the HCP process. Secretary Babbitt's "no surprises" policy helps with that, and Murray Pacific will hold him to it (Zender 1995).

from (see, for example, Bean et al. 1991). Of course, the developer would need to consider that the benefits of being able to operate with an "incidental take" permit issued pursuant to the HCP must outweigh the costs of preparing an HCP (see Mann and Plummer 1995a).

Additional take flexibility is available to private landowners, as the next sections illustrate. Especially attractive are ESA section 4(d) "special rules" for take of threatened species. There are also "no take" agreements.

**"Special Rule" on Take (ESA §4(d)).** The ESA offers what is referred to as a section 4(d) "special rule" that can be applied to threatened species. It functions essentially as an "incidental take" permit without forcing non-federal landowners to go through the section 10 habitat conservation plan process.

In the Pacific Northwest, the Service is

currently working on 4(d) "special rules" for the northern spotted owl, marbled murrelet, and bull trout (C. Lobdell, pers. comm.), even though the bull trout is currently in a "warranted but precluded" status (see **Appendix C**). A section 4(d) rule has also been used for a real estate development project in Southern California (Whalen 1995).

This is what ESA section 4(d) says:

Protective Regulations.—Whenever any species is listed as a threatened species..., the Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation of such species. The Secretary may by regulation prohibit with respect to any threatened species any act [i.e., a take] prohibited under section 9(a)(1), in the case of fish or wildlife, or section 9(a)(2), in the case of plants, with respect to endangered species; except that with respect to the taking of resident species of fish or wildlife, such regulations shall apply in any state which has entered into a

cooperative agreement pursuant to section 6(c) of this Act only to the extent that such regulations have also been adopted by such State. (ESA § 4 (d)).

There is a good bit of legalese in section 4(d), to be sure. However, it appears to provide leeway for creative action if consulting agencies choose to exercise this authority (A. Smith, review comments).

The section 4(d) rule now available in draft form for spotted owls in Washington will help provide additional flexibility. Some suggest that 4(d) may only tolerate regulations which promote recovery (Rohlf 1989).

**Additional Take Flexibility.** In addition to take flexibility offered through HCPs and 4(d) rules, potential take flexibility is also available through "no take" agreements and pre-listing agreements.

**"No take" Agreements.**—"No take" agreements are an attempt to increase the flexibility of taking prohibitions on private land. According to Gidari (1995), an attorney in private practice with Plum Creek Timber as a client, the Service has some discretion in ESA enforcement. Although neither the ESA nor Service regulations provide for "no take" agreements, discretion allows their consideration. A "no take" agreement is a promise by the Service not to enforce the ESA if a landowner's activities are conducted consistent with those upon which the Service based its "no take" opinion (Gidari 1995). Zender (1995), an attorney with the Murray Pacific Corporation as a client, helped the tree-farming firm obtain an approved habitat conservation plan that is in effect for 100 years under a "no take" concept (Zender 1995).

It is possible to obtain a "clearance letter" to increase take flexibility (M. Feldman, review comments). An analogy for such a "no take" arrangement is an opinion letter from the Internal Revenue Service or the Securities Exchange Commission agreeing that certain activities will be treated a certain way for tax purposes or will not violate securities laws, respectively. Several legal issues are involved. "No take" agreements do not prevent citizen groups from suing for violation of an ESA section 9 take. The ESA section 7 prohibition on "jeopardy" and adverse modification of

critical habitat still constrain the Service's ability to enter into a "no take" agreement, so a federal connection to a project may limit the applicability of "no take" agreements. Also, non-federal landowners may have to perform a NEPA-type environmental assessment or public notice and comment to enter into a "no take" agreement, which limits their attractiveness (Gidari 1995).

**Pre-listing Agreements.**—A pre-listing agreement is a contract with a federal agency, and terms and conditions are fully negotiable. Neither the ESA nor Service regulations provide for any form of unlisted species agreements. However, according to Gidari (1995), the legislative history of ESA § 10 indicates that such coverage may be possible if threats to unlisted species are adequately covered in an HCP and no material changes have occurred in the species' status since the issuance of the permit. The certainty of outcome upon listing the species is reduced because of independent obligations of the Service to avoid "jeopardy" to listed species.

Three types of pre-listing agreements related to "incidental take" are worth considering: 1) pre-listing, with automatic "incidental take" permit issued upon listing; 2) pre-listing, with a draft HCP submitted upon listing; and 3) an "in lieu of listing" agreement. The net benefit comes if a pre-listing agreement is considered during the listing decision and it results in fewer listings in the area; however, it is unlikely that the Service can negotiate away its obligation to list (Gidari 1995).

Such pre-listing agreements between the Service and private developers would be similar to cooperative agreements between the Service and state agencies, such as Conservation Agreements (see Question 8). According to a draft internal guidance document,

The FWS should not overlook opportunities for pre-listing and preventative conservation planning under the section 10 process through "advance HCPs." Careful negotiations and conservation planning with landowners often can eliminate or substantially reduce threats to candidate species and may even preclude the need to list some species. These are just a few of the ways the public and private sector, by working together, can more effectively address the difficult issue of conserving rare and

endangered species on private lands. (US-FWS 1994c, p. 49).

### **Experimental Populations (ESA § 10(j)).**

This flexibility feature deals exclusively with the translocation of listed species from one area to establish a population in another area.

Reintroduction of the gray wolf in the central Idaho wilderness is being done by treating them as an "experimental non-essential" population. The proposed reintroduction of the grizzly bear in the Selway-Bitterroot Wilderness may also be treated as an "experimental non-essential" population (MacCracken et al. 1994). However, if these reintroduced species are indeed "non-essential" populations, this is equivalent to saying they are not necessary for the recovery of the species. The reintroductions are apparently being done to attain some objective beyond that of species recovery and section 10(j) is the only legal way to do that (A. Smith, review comments).

The experimental populations feature in section 10(j) overcomes the stringent protective measures that apply to an endangered species and can discourage transplantation as a recovery method (Wise et al. 1991). Local interests often fear that economic activity will be curtailed by the restrictions that accompany the presence of a listed species. In 1982, Congress responded to the "fears expressed by industry that such experimental populations would halt development projects" (H.R. Rep. No. 567 [1982], p. 17) by defining a new category of listed species—"experimental non-essential population"—and giving the Secretary greater flexibility in managing such populations (Wise et al. 1991).

An experimental population will generally be treated as a threatened rather than an endangered species, resulting in less stringent management measures. The change in status is significant because the Act's taking prohibitions do not automatically apply to threatened species, as they do to an endangered species. As Congress noted, treating an experimental population as a threatened species

grants the Secretary broad flexibility in promulgating regulations to protect such species. These regulations can even allow the taking of threatened animals.... For example, the release

of experimental populations of predators, such as red wolves, could allow for the taking of these animals if depredations occur or if the release of these populations will continue to be frustrated by public opposition. (H.R. Rep. No. 567 [1982], p. 34).

Although the experimental population approach would allow greater flexibility in managing the gray wolf, it was not clear until recently if this method could be used in Idaho. One of the conditions for releasing an experimental population is that the introduced population is "wholly separate geographically from nonexperimental populations of the same species" (ESA § 10(j)(1)). Do unconfirmed sightings of lone wolves in Idaho qualify as nonexperimental populations? If the answer is yes, then the reintroduced population could not be classified as "experimental." However, if there must be breeding wolves in Idaho to be considered a population, then reintroducing an experimental population would be feasible under the ESA (Wise et al. 1991). The question apparently has been resolved, and 15 wolves were translocated from Canada to Idaho in January 1995.

Experimental populations are a special case of ESA flexibility, but an important consideration in Idaho as reintroduction of grizzly bears into the Selway-Bitterroot Wilderness is currently being considered (see MacCracken et al. 1994).

### **Pre-listing Strategies**

The following point deserves emphasis. The Endangered Species Act mandates that the five factors that cause endangerment be evaluated when the FWS makes its biological determination that a species is threatened or endangered (ESA § 4(a)(1)). These factors need to be mitigated before a species can be delisted.

Often the factors leading to endangerment are well known long before the species is listed under the ESA. That was certainly the case with the northern spotted owl and salmon. In many ways, the ESA is an explicit recognition that other attempts that might have been made to protect the species in question have failed.

The ESA (§ 4(f)(2)) exempts recovery teams

from the Federal Advisory Committee Act (FACA). Opdycke (1993) suggested that exempting pre-listing recovery teams from the requirements of the Federal Advisory Committee Act (FACA) is crucial for their functioning. Experience in Idaho reinforce the need for such flexibility (A. Thomas, pers. comm.).

***Interstate and International Coordination.***

Although many ESA observers are calling for an ecosystem-based approach to the ESA, the wider application of section 4(b)(1)(A) is seldom mentioned. This section of the ESA requires listing determinations to be made "after taking into account those efforts, if any, being made by any State or foreign nation... to protect such species."

For example, the Idaho Conservation Effort for bull trout did not consider what the states of Montana, Washington, and Oregon were doing. As another example, maps of ESA grizzly bear recovery zones stop at the Canadian border; bears do not. As yet another example, tension is building between Alaskan, Canadian, Indian tribe, and lower 48 salmon fisherman over who should be able to catch how many fish and when and where.

Perhaps coping with problems that cross political boundaries could be facilitated with local biological data, but how meaningful is that without considering what those organisms on the other side of a boundary are doing? Crossing these boundaries by considering them in management will ultimately be necessary, and the sooner it is done, the more effective and efficient species conservation efforts are likely to be.

***Cooperative Agreements.*** The Idaho Department of Fish and Game (IDFG) participates in the recovery efforts for listed species under ESA section 6. The Interior Department Secretary is authorized to negotiate cooperative agreements to provide financial assistance to states such as Idaho that have established and maintained acceptable and active programs for conserving federally listed species (Melquist 1993b).

There is a "Limited Authority-Cooperative Agreement" between the FWS and the IDFG for listed species in Idaho. The original

cooperative agreement was signed in 1979, and a new agreement was developed in 1995. (Copies of these agreements may be obtained from the Policy Analysis Group or the Idaho Dept. of Fish and Game.) A similar agreement exists between the FWS and the IDPR for plants. Funds received by the IDPR are transferred to the Idaho Conservation Data Center, and are used primarily for surveys of plants being considered for listing.

The IDFG has used ESA section 6 funds to promote species recovery in Idaho by becoming involved in a number of projects working with several federal and state agencies and conservation groups. Examples (see Melquist 1993b) include:

- participating with federal and Canadian biologists in transferring woodland caribou to northern Idaho;
- cooperating in the release of more than 200 young peregrine falcons;
- conducting annual bald eagle nesting surveys, even though no federal funds exist for this; and
- conducting telemetry studies on the ecology of grizzlies on the Selkirk Mountains in northern Idaho. (Melquist 1993b).

Although ESA section 6 assists listed species, the process is far from ideal (Melquist 1993b). The Act has the tools to do the job it is supposed to do—prevent extinction—however, it has been far less successful in affecting recovery and delisting. For example:

- funding through ESA § 6 has been unreliable, inconsistent and based on annual appropriations;
- many states often hesitate to launch the long-term efforts necessary to truly recover species;
- as the number of listed species increases, the funding "pie" gets cut into smaller pieces; and
- upper levels of the FWS administration dictate which projects will receive section 6 funding, often ignoring projects identified by the IDFG in collaboration with the FWS own Boise field office as having higher priority. (Melquist 1993b).

A survey by Melquist (1995) indicated that other states have concerns about how section 6 funding is implemented.

***Conservation Agreements.*** The Conservation Agreement (CA) process was discussed at length in Question 8. Here the potential of the

Conservation Strategy/Conservation Agreement (CS/CA) process is examined as a way to increase the flexibility of the management and conservation opportunities available to federal and state agencies and private landowners.

This approach should be taken seriously as an effort to mitigate factors causing endangerment in order to keep species from becoming listed. Idaho is a leader in the development of this approach, and it has received attention in this report (see Question 7, the snail case study in this chapter, and the bull trout case study in **Appendix C**).

From a state agency perspective, the Conservation Agreement process allows the agencies to retain some management flexibility and establish the state as the lead conservation organization in an interagency or cross-jurisdictional effort. This CA process requires the cooperation of many federal, state, and local government agencies with jurisdiction over plant, fish and wildlife, as well as private landowners and businesses. The key to success here is cooperation and collaboration, which are perhaps easier to attain under the CA process than through the ESA processes.

Participating in a conservation effort is voluntary. Although agencies and private landowners are not required to make adjustments in land management practices before a species is listed, individuals from agency and private organizations involved in the Idaho Conservation Effort believe it makes sense to do so (USDI-BLM 1995). Before a species is listed, there is more flexibility in how agencies and landowners can approach management of an imperiled species. Haufler (1995), a wildlife biologist with Boise Cascade Corp., said there are more types of options available to the agency, and more land management practices that can be implemented, and modified if necessary, to try to improve the conditions for the species.

Wall (1995), Haufler's counterpart with Potlatch Corp., said the Conservation Agreement effort has been met with some resistance from the private sector. This resistance stems from the essential need of a private corporation to maintain management flexibility. A perception exists that specific and prescriptive land management practices developed in a conservation strategy for public

lands will have a direct effect on private lands when interpreted by the courts (Wall 1995). The riparian buffer zones developed for federal forest lands under PACFISH guidelines (see the salmon case example in **Appendix B**) could become an example of this. These prescriptions were developed for federal forests west of the Cascade Range, and have been brought over the mountains for application in inland forest ecosystems that are quite different than coastal forest ecosystems, yet no adjustments were made to the "one-size-fits-all" buffer strip width prescription.

Private sector resistance also stems from a perception of the prescriptive nature of the Conservation Strategy approach. Specific prescriptions are perhaps best left to the Conservation Agreement rather than identified in the Conservation Strategy. The Conservation Agreement should be developed as a collaborative process (Wall 1995). That is, it should take a flexible adaptive management approach that reflects differences in land management objectives and responsibilities for both public and private lands and yet meets the needs of the species. When corporations are involved in Conservation Agreements, some guarantees must be made through the prelisting Conservation Agreement in the event of future listing. For example, provisions agreed to in the CA should carry through to Habitat Conservation Plans (Wall 1995).

The concept of Conservation Agreements is just beginning to be applied, and much work is needed to improve the process. This work begins with communication. Conservation Agreements are an opportunity that may facilitate a change in the FWS philosophy from a regulatory approach to one of solving the many different environmental problems facing landowners today (Wall 1995).

Often the very same things we need to do to recover the species are the same things we need to do to remove the threats (C. Harris, pers. comm.). So in many respects we are going to have to change the way we do things on the land to conserve species and protect species and their habitats. The goal of the Idaho Conservation Effort is to reduce threats to candidate species. At times this goal will not be met and a species will be listed.

However, the conservation effort will still pay off, because the threats to the species, the actions required to conserve the species, and the partners involved in the strategy will have already been identified (USDI-BLM 1995). There is much to learn from the Idaho Conservation Effort, including not waiting to take action until an ESA listing seems imminent. When a species is in decline, delay only forecloses options that would otherwise provide additional management flexibility.

The Conservation Agreement approach has potential to improve the situation for many species before they become listed. If there are problems with this approach, it is that the ESA puts federal agencies in charge of species conservation. State agencies and other organizations that should be involved in the development of conservation assessments, strategies, and agreements deserve to have a lead role in this pre-listing approach, with good faith efforts by federal agencies. In the case of bull trout, it seems that federal agencies worked out their own strategy while nonfederal agencies worked on theirs. Potential improvements in the process and lessons from experience in Idaho are evident in the Bruneau hot springs snail case immediately following, and the bull trout case study in Appendix C.

#### *Case Study—Bruneau Hot Springs Snail.*

The case of the Bruneau hot springs snail provides an example of 1) how agency flexibility in listing decisions is limited by citizen lawsuits, and, more importantly, 2) the potential flexibility in Conservation Agreements. This case study features an early attempt to develop a Conservation Agreement, and although the snail was eventually listed, a Conservation Agreement may be an essential feature of a recovery plan and eventual delisting.

The Bruneau hot springs snail is a tiny snail with habitat restricted to small thermal springs and seeps along a 5¼ mile stretch of the Bruneau River, in southwestern Idaho. The snail is most abundant in areas where the water temperature ranges from 77 to 96 degrees Fahrenheit. Although its shell is transparent, the snail appears black because of the pigmentation of its body (US-GAO 1993b,

Klahr and Duke 1994).

**Chronology.**—The FWS first became aware of the Bruneau hot springs snail in 1979 when an academic biologist who had studied the species since 1959 informed the FWS' Boise Field Office that the snail's habitat was disappearing. Under contract to the FWS, the biologist conducted further studies on the snail's status and reported his findings to the FWS in June 1982. His report and subsequent information gathered by FWS biologists indicated that the snail was threatened primarily by the modification of its habitat caused by the agricultural demand for water drawn from the underlying geothermal aquifer. Other identified threats included sedimentation from flash flooding, livestock grazing, and predation by insects and nonnative fish (US-GAO 1993b).

In May 1984, the FWS classified the snail as a Category 1 candidate species—a species for which the FWS has adequate information to support a proposal for listing under the ESA. Accordingly, in August 1985, the FWS published a proposed rule to list the snail. However, the agency did not issue a final rule to list the snail until January 1993, roughly 6 years after the decision was due. The FWS decision to list the snail was prompted by a July 1992 lawsuit charging that the agency had violated the ESA by failing to make a final determination on the snail (US-GAO 1993b). Table 12-3 presents key dates in the snail's listing process.

According to the General Accounting Office, two factors contributed to the delay in publishing a final rule to list the snail: 1) concern about the potential adverse economic and other impacts of a decision to list, and 2) the development of a Conservation Agreement as an alternative to listing (US-GAO 1993b).

The initial period for public comment on the FWS' proposed rule to list the snail lasted from August 1985 until February 1987. During this time, the FWS received comments from a number of parties—including the Governor of Idaho, the Idaho Water Resources Board, local farmers and ranchers, and other water users—expressing concern about the potential impacts that a listing could have on the local economy. According to the FWS, during the public comment period the agency

Date	Event
8/21/85	The U.S. Fish and Wildlife Service (FWS) published a proposed rule to list the Bruneau hot springs snail (US-GAO 1993b).
12/30/86	The FWS extended its consideration of its proposed rule until February 1987 and reopened the public comment period (US-GAO 1993b).
2/6/87	Deadline for the final listing rule passed (US-GAO 1993b).
7/6/92	The Idaho Conservation League and the Committee for Idaho's High Desert sued the FWS for failing to make a listing decision on the snail (Associated Press 1992f).
1/25/93	To settle the lawsuit, the FWS published a final rule listing the snail (Garber 1993b).
5/8/93	The Idaho Farm Bureau sued the FWS for failing to follow procedures in the listing decision (Etlinger 1993b).
12/14/93	The district court ruled for the plaintiff and ordered the FWS to remove the snail from the endangered species list (Warbis 1993).
2/23/94	The Idaho Conservation League and the Committee for Idaho's High Desert appealed the decision ( <i>Idaho Statesman</i> 1994).
6/29/95	The Ninth Circuit Court of Appeals ordered the FWS to list the snail as an endangered species (Egelko 1995).

received no substantive information indicating that the snail was more widely distributed or less threatened than was originally thought (US-GAO 1993b).

In February 1988, two Idaho members of Congress wrote to the FWS Director requesting that the FWS not proceed with listing the snail at that time because doing so could have devastating effects on the local agricultural community. The congressmen outlined a number of steps they believed would protect the snail and lead to its recovery without an ESA listing. They also offered their support for securing funds necessary to carry out these actions. They concluded by noting that unless the FWS Director would assist them in this matter, they would object to consideration of a bill to reauthorize the ESA. In an April 1988 letter of response, the FWS Director stated he would comply with the request by the congressmen and would delay the final decision on listing the snail pending

adequate congressional funding for, and implementation of, a Conservation Agreement (US-GAO 1993b).

**Conservation Agreement.**—The FWS prepared a first draft of a Conservation Agreement in August 1986. The agreement's stated goal was to conserve and protect the snail without implementing the full protection offered by listing under the ESA. Subsequent drafts were prepared in September 1986 and March 1988. In early 1989, FWS began implementing a Conservation Agreement for the snail. The parties that participated in the agreement included the U.S. Geological Survey, the Idaho Department of Water Resources, and Idaho State University. These entities agreed to provide the FWS with such information as geological maps of the location, elevation, flow, and temperature of spring flows in the area; an analysis of the hydrology of the surrounding geothermal aquifer and the cause of reduced flows of water from the



springs; and a study of the snail's biological, ecological, and physiological needs. In addition, the FWS secured agreements with Owens Ranches, Inc., owners of much of the snail's remaining habitat, and Interior's Bureau of Land Management, which provided fencing to keep livestock from grazing in areas that are the snail's habitat (US-GAO 1993b).

According to the U.S. General Accounting Office (US-GAO 1993b), attempts to develop a Conservation Agreement as an alternative to listing under the ESA contributed to delays in the agency reaching a listing decision for the Bruneau hot springs snail. Furthermore, the use of such a Conservation Agreement was inconsistent with the applicable policy and guidance. Discussions with FWS officials and field biologists disclosed major concerns about whether such an agreement afforded sufficient protection for this species (US-GAO 1993b).

The FWS policy for developing and using Conservation Agreements in lieu of listing has varied over time. In 1983, the FWS adopted a policy allowing the use of Conservation Agreements as an alternative to listing, provided all known threats to the species were removed. Policy guidance at that time, according to the FWS deputy director, was that the intent of such agreements be in effect by the time a listing decision was required. The FWS policy guidance also called for careful monitoring to ensure that the agreement's objectives were achieved and that any corrective actions, including listing, were instituted as necessary (US-GAO 1993b).

In May 1985, the FWS discontinued its policy of using Conservation Agreements as an alternative to listing species. This decision remained in effect until February 1992, when the FWS again decided to allow the use of these agreements. In explaining its 1992 policy decisions, the FWS characterized a Conservation Agreement as "an appropriate mechanism to use to maximize the protection of a candidate endangered or threatened species when ... [the agreement] effectively removes known threats." In May 1993, the deputy director stated that the FWS was in the process of revising its policy on Conservation Agreements and that a new policy would be issued in the near future (US-GAO 1993b). That has been done at the federal level and in

Idaho (see US-FWS 1994a, 1995a).

The Conservation Agreement for the snail disclosed that the agreement was inconsistent with the FWS policy and guidance. First, the agreement was developed and finalized between August 1986 and early 1989, during the period when the FWS had discontinued its policy of using such agreements. Second, even under the FWS former and current guidance on Conservation Agreements, the agreement covering the snail would be deficient because the parties never adopted specific plans for removing the primary known threat to the species—the loss of habitat due to reduced flows from warm water springs. Third, the agreement was not in effect in February 1987 at the time the final ESA listing rule was required (US-GAO 1993b).

According to what two FWS officials told the GAO, the Conservation Agreement for the Bruneau hot springs snail was not an appropriate alternative to listing the species under the ESA. One official with the Division of Endangered Species at FWS headquarters in Washington, D.C., stated that the agreement was no more than a study plan that contained no significant protection for the snail. The other official, the supervisor of the Boise, Idaho, FWS field office with primary responsibility for considering the snail for listing, expressed a similar view. The official stated that the Conservation Agreement was not an appropriate substitute for listing because the agreement did not provide for removing all threats to the snail. Both officials believed that a decision to list the snail under the ESA was warranted and that the FWS should have listed the species at the time the decision was required (US-GAO 1993b).

The GAO recommended that when the FWS director was considering whether or not to authorize the use of a Conservation Agreement to protect a species that would otherwise warrant listing under the ESA, the FWS should ensure that the agreement 1) addresses the known threats to the species, 2) contains provisions for effective monitoring to ensure that the agreement's protection mechanisms are properly and fully implemented, and 3) is implemented in a timely manner. In addition, the GAO recommend that the FWS director routinely review the effectiveness of such

agreements following their implementation (US-GAO 1993b).

**Litigation.**—In July 1992, two Idaho conservation groups sued the FWS to try to force the listing of the snail as endangered (Associated Press 1992f). The listing was approved by the district court as a settlement agreement between the federal government and the conservation groups, and the snail was added to the endangered species list in January 1993 (Garber 1993b). During the public comment period a few months prior to the listing, the Idaho Department of Water Resources said there was insufficient evidence to justify the listing (Associated Press 1992g), and then discovered and reported an error in the U.S. Geological survey data the FWS used to support the listing (Associated Press 1993k). The Idaho Legislature passed a resolution asking Congress to take the snail off the endangered list (Garber 1993c, *Idaho Statesman* 1993a).

In May 1993 the Idaho Farm Bureau sued the government to void the listing of the snail, alleging that the FWS had violated ESA procedures (Etlinger 1993b), and asked for an injunction in September 1993, expressing concern that Bruneau area ranchers might have trouble getting Farmers Home Administration loans approved and might lose BLM grazing permits due to the listing (Garber 1993d). The FWS lost the suit, and the court ordered the snail removed from the endangered species list in December 1993. The court also said the FWS ignored crucial information during the final months before deciding to list the snail (Warbis 1993). This is the first case of a species being taken off the list as a result of litigation (Klahr and Duke 1994), and the conservation groups appealed the decision to the Ninth Circuit Court of Appeals (*Idaho Statesman* 1994).

Bruce Babbitt, Secretary of the Department of the Interior, visited the Bruneau hot springs area in December 1993, and said he saw no reason to list the snail if the state would better manage the groundwater aquifer the snail depends on (Garber 1993e). In June 1995, the appellate court ordered the FWS to return the snail to the endangered species list, and ordered the agency to make public the U.S. Geological Survey report that was instrumental

in the listing, and any other pertinent information as the FWS reconsiders the snail's status (Egelko 1995).

**Recovery Plan.**—Both the Idaho Farm Bureau and the Idaho Conservation League have indicated a willingness to work out a water management plan that would remove the cause of endangerment (Egelko 1995). In July 1993, the recovery plan for the snail was published in the *Federal Register*, and it appeared that agricultural activities in the Bruneau area would not come to an end, as some had predicted. The plan, according to Chuck Lobdell, Idaho supervisor for the FWS, included a number of suggestions made by farmers, ranchers, and other area residents (McCoy 1993a).

The snail will be considered for downlisting to threatened from its current endangered status "when a habitat (groundwater) management plan is in place which stabilizes and provides permanent maintenance of the remaining habitats for a period of five years" (McCoy 1993a). Delisting will be considered "when discharge at remaining springs snail habitats has been stable, or has increased for an additional five-year period, and-or when significant numbers of additional colonies are established, or new colonies located in secure habitats." The recovery strategy calls for stabilizing and securing snail habitat, monitoring the groundwater, monitoring the snail population and habitat, and updating and revising the recovery plan periodically.

Conservation measures which "may help achieve recovery objectives" are ongoing, and include the items in Sidebar 12-2 (McCoy 1993a).

### Post-listing Strategies

Once a species is listed, protection is afforded the species while recovery plans are developed and implemented. Many improvements for protection are considered in this report, including clarification of what it means to take a species under section 9, streamlining of the cumbersome consultation process to determine if a federal project results in "jeopardy" to a species, and explicit attention to the ambiguous concept of critical habitat.

## Sidebar 12-2.

Bruneau Hot Springs Snail Conservation Actions

- **Groundwater Management Area:** The Idaho Department of Water Resources (IDWR) regulates groundwater development in the Bruneau area.  
In 1982, the IDWR established the Bruneau-Grandview Ground Water Management Area, which allows the IDWR to continue to delay action on water permits until it can be demonstrated that sufficient water is available and the withdrawal will not adversely impact other water rights within the Bruneau area.  
"There is presently no anticipation of a modification of the designation," ... because IDWR has said monitoring hasn't shown recovery of water levels in the area.
- **Controlling leaking artesian wells:** thirteen have been identified in the Bruneau area and leakage control plans are being developed.
- **Hot Creek Conservation Easement with Owens Ranches:** the FWS established a three-year wildlife extension agreement with the Owens Ranches at Bruneau to protect privately owned springs snail habitats in Hot Creek.  
The perimeter of Hot Creek containing the snails was fenced to exclude domestic livestock and restrict public access. The agreement expired Oct. 31, 1992, but fencing will remain, and livestock will continue to be excluded.
- **Springs snail habitat and population monitoring:** Idaho State University conducted an ecological life history study of the snails in late 1989, and will continue to monitor key habitat variables, springs snail abundance and population structure each month.
- **Conservation Reserve Program:** Some 15,000 acres of croplands in the Bruneau area are currently enrolled in CRP, and groundwater withdrawals declined over the past 10 years, primarily because of this enrollment.  
While water levels in the geothermal aquifer continued to decline over the same time period, CRP has contributed to the conservation of groundwater.

Source: McCoy (1993a).

**Partnerships and § 4(d) "Special Rules" on Take.** This section highlights how partnerships and special "no take" rules can enhance recovery success. John Turner, director of the FWS from 1990-94 said, "sound partnerships may prove our best and surest vehicle yet to carry forth a full and rich biological community into the twenty-first century" (Bullock and Wall, 1995). Partnerships will be necessary to successfully implement ecosystem-based natural resource management strategies, because a diversity of ownership objectives and constraints must be overcome before real progress can be achieved (Sample 1994).

**Case Study—Louisiana Black Bear.** An example from outside Idaho is used because it brings private lands into the picture, which we often tend to overlook in a state such as Idaho that is dominated by federal lands.

The case also illustrates the importance of a partnership approach to species conservation. Aldo Leopold (1936) called for the formation of a joint committee of stakeholders to inventory and define the management needs of the "threatened members of our fauna and flora" in an 1936 essay titled "Threatened Species":

I am satisfied that thousands of enthusiastic conservationists would be proud of such a public trust, and many would execute it with fidelity and intelligence. I can see in this setup more conservation than could be bought with millions of new dollars, more coordination of bureaus than Congress can get by new organization charts, more genuine contacts between factions than will ever occur in the war of the inkpots, more research than would accrue from many gifts, and more public education than would accrue from an army of orators and organizers (Leopold 1936).

The Louisiana Black Bear Conservation Committee (BBCC) example successfully demonstrates that economic goals and ecological responsibilities of private land ownership are not necessarily mutually exclusive (Bullock and Wall, 1995). At the heart of this approach was a section 4(d) "special rule" for take of a threatened species, developed and implemented through a partnership arrangement.

As a "charismatic megafauna," the black bear has come to symbolize the health of the bottomland hardwood ecosystem health in the lower Mississippi River plain. The BBCC has emerged as a cornerstone of trust and cooperation for other more complex resource management and conservation projects in the region. Many believe the BBCC's greatest contribution is that its future impact on resource management may extend to reauthorization of the ESA, paving the way for prelisting partnership opportunities that offer the "carrot" of incentive, rather than the "stick" of regulatory burden. It is clear to some observers that protection of threatened or endangered species is no longer an issue to be decided under the cloak of agency regulation (National Wildlife Federation 1995) or within the adversarial proceedings of a courtroom. Bullock and Wall (1995) suggested that a better alternative is a proactive approach whereby all stakeholders who have opposing points-of-view are willing to sit down at the same table and seek common ground on which to formulate a management strategy. A phrase coined by one of the original participants in the BBCC, Murray Lloyd, says it all: "Feed bears, not lawyers." This means each stakeholder devotes their time, money, and effort toward the resource, rather than squandering them trying to achieve other agendas (Bullock and Wall 1995).

Efforts to conserve listed species or implement ecosystem-based land management will be more likely to succeed if private landowners are willing participants. The Louisiana black bear situation illustrates the partnership concept to integrate species needs with private landowner objectives and constraints (Bullock and Wall 1995), as well as the flexibility available in ESA § 4(d).

*Using ESA Take Flexibility.*—In June 1990,

the FWS published a proposal to list the Louisiana black bear (a subspecies) as threatened, citing extensive habitat loss and human exploitation as primary threats or factors causing endangerment. (See US-GAO [1993b] for a history and analysis of listing events, and Davidson and Pashley [1992] for an early summary of the program.) In July 1990, the Louisiana Forestry Association assembled all interested stakeholders, and the seeds for the Black Bear Conservation Committee (BBCC) were planted. From that initial meeting of 18 individuals, the BBCC has evolved to a coalition of more than 60 landowners, state and federal agencies, citizen conservation groups, forest products companies, agricultural interests, and universities (Bullock and Wall 1995).

On December 30, 1991, the FWS made public its decision to list the Louisiana black bear as a threatened species. The final rule (*Fed. Reg.* [January 7, 1992]) also designated all other black bears within the historic range as threatened due to similarity of appearance. Important to the listing decision was inclusion of a section 4(d) "special rule" allowing normal forest management practices in occupied bear habitat, with certain limitations on active or candidate den trees. This was significant because more than 90% of the Louisiana black bear's historic range is now in private ownership. During the listing process and the public comment period, much of the opposition to listing came from private forest landowners, who perceived the bear would become the "spotted owl" of the South. They feared the listing would either severely curtail forest management and harvesting operations in the region, or adversely impact their other rights of private land ownership. Based on the best available data and in response to the concerns of forest landowners, the FWS took the position that the bear's habitat needs were compatible with "normal" forest management as practiced in the region. Therefore, as part of the 4(d) rule, the FWS exempted "normal" forest management activities from the section 9 take protection of the ESA. The only restrictions in the 4(d) rule applied to maintenance of actual or potential den trees in occupied habitat. The 4(d) special rule had a positive impact, particularly on private

industrial landowners, and quickly turned management of forest land for bear habitat into an asset for both the animal and the landowner, rather than a liability (Bullock and Wall 1995).

**Partnership Approach.**—Since its inception, the broad objective of the BBCC has been to stabilize and manage existing bear populations, and restore them to suitable habitats within the tri-state region so the bear can be delisted. Initially, four subcommittees were established to work with four basic problems and issues: habitat and management, information and education, research, and funding. To date, the BBCC has made significant progress toward its overall objective, including the following accomplishments: 1) increasing the public's awareness about the black bear, its status and management needs; 2) promoting the bear as an asset to private landowners, rather than a liability; 3) creating, staffing, and funding a full-time coordinator to serve administrative and extension capacities; 4) coordinating regional research efforts and helping secure over \$700,000 in research funds; 5) publishing a "Black Bear Management Handbook" to assist landowners and land managers who wish to maintain or enhance bear habitat; 6) developing a protocol for handling nuisance bears and mediating bear-human conflicts; and 7) completing a comprehensive restoration plan for bears in the tri-state region which sets objectives for restoration, identifies management needs, establishes local "bear management units" and designates those responsible for implementation. Authored cooperatively by all interested public and private stakeholders, this plan also served as the template for the FWS Draft Recovery Plan for the Louisiana black bear (Bullock and Wall 1995).

The BBCC has had three primary beneficiaries. First, each individual stakeholder partner has benefitted, both tangibly (i.e., by realization of individual objectives) and intangibly (i.e., by increased credibility with other stakeholders). Second, as discussed in more detail below, the BBCC has become a public-private partnership model of how resource management issues can be addressed through cooperation rather than confrontation. Third, the probability of

restoration of the black bear to the point it can be delisted has improved markedly. People are learning that with responsible planning and management, the bear can coexist with many land uses, including forestry, agriculture, oil, gas and mineral exploration, and outdoor recreation (Bullock and Wall 1995).

As landowners, land managers, and other entities came together, a number of individual agendas emerged. Those included: to keep the bear from being listed; to list the bear; to keep regulatory burden from interfering with the management and productivity of private lands for forest, agricultural, oil or gas or other interests; to be aboard the best vehicle to level the playing field and balance all stakeholder interests; to advance scientific study or secure research funding; to demonstrate a species can be "recovered" through a proactive voluntary approach; to resolve species-human conflict or be compensated for bear-related property damage; to have enough bears to reopen a hunting season; to raise funds for conservation-based organizations or projects; to keep swamps from being dredged or hardwood forests from being converted to other uses; to obtain consulting jobs; and to satisfy personal resource stewardship ethics. The sole criterion for membership in the BBCC was, and remains, when you come to the BBCC table, the bear and its habitat are given highest priority. All other agendas are checked at the door. Whatever the reason for involvement, all participating organizations without exception have respected this and elevated the bear's needs above individual or organizational bias (Bullock and Wall 1995).

A major factor contributing to the growth of and support for the BBCC is that it began as a local or regional initiative. During its formative period, national organizations were welcomed to participate, but discouraged from formally applying for membership. It was felt the initiative would receive stronger support if people within the region knew local entities were the driving force. In this case, national organizations and agencies recognized the value of conflict resolution driven from the "bottom up" through local participation (Bullock and Wall 1995).

Federal government agencies may serve partnership initiatives by being a "catalyst

organization" to facilitate goal setting, stakeholder identification, and meeting logistics (Sample 1994). This is a lesson from the BBCC with direct application to implementation of an ecosystem-based management strategy. Any initiative crossing multiple ownerships has a higher likelihood of success if it begins with affected landowners at the local level. Local or regional stakeholders and landowners must feel they are driving the wagon, not just hanging on for dear life or being run over! (Bullock and Wall 1995).

The key question: How is the Louisiana black bear doing? One of the two populations has increased by 20% since 1990. The other, in the Atchafalaya Basin, a formidably large wetland area, is uncountable, but probably doing well (Lloyd 1995).

The BBCC could be a model for cooperative partnership to resolve natural resource conflicts. One example of a successful initiative modeled after the BBCC is Project SHARE (Salmon Habitat and River Enhancement), a cooperative of landowners and agencies in Maine (Sweeney and Nickerson 1995). The goal of SHARE is to enhance habitat quality for Atlantic salmon (*Salmo salar*) populations in downeast Maine. Like the BBCC, Project SHARE is based on the operating principle that participation is open to all stakeholders who can contribute to the conservation of the Atlantic salmon. The key to successful cooperation is to focus on the species and its habitat, not on the politics or implications of a listing. The stakeholders involved also recognize that this type of cooperative effort extends beyond an endangered species, as evidenced by the following:

Given the enthusiasm and support from all sectors, Atlantic salmon will undoubtedly benefit from Project SHARE. But the larger benefit will be the lasting standard of cooperation that is established from dealing with endangered species concerns. The resource, the Act, and a significant component of Maine's economic base will all be the better for it, rather than the lesser because of it. We are hopeful that the trust established between cooperators will expand to the conservation and use of other resources in Maine. We are also confident that this process can be applied in many other areas. (Sweeney and Nickerson 1995).

According to Bullock and Wall (1995), there are four primary reasons for the success of the BBCC. First is the characteristics of the BBCC that make it a true partnership: 1) the requirement that all participants leave their organizational bias at the door; 2) the open door for all willing stakeholders to participate as equal partners; 3) the mutual respect among BBCC members for the objectives of each individual participant; 4) the forum for open and credible communication; 5) the fact all members make some contribution no matter how small; and 6) the effort to initially identify common ground among participants from which a base of mutual trust could be established.

The second reason for the success of the BBCC has been the efforts to identify incentives to make the species an asset, rather than a liability to the private landowner—a most important factor given 90% percent or more of the bear's habitat is in private ownership. The principal regulatory agency, the FWS, deserves special recognition for its efforts to support this approach. The section 4(d) special rule promulgated as part of the listing procedure exempted normal forest management activities from the take provisions of section 9 of the ESA, thus providing an incentive for the maintenance, management, and restoration of bear habitat. Another incentive is that lands identified as occupied habitat have received a higher priority for acceptance into habitat restoration programs. Recognition that the black bear is an indicator of the health of the bottomland hardwood forest ecosystem, and the demonstration that good bear management benefits a wide array of other game and non-game wildlife species, have also been incentives, as has an active campaign to quickly and positively respond to adverse human-bear situations (Bullock and Wall 1995).

The third success factor has been the political support given the Committee. More and more wildlife management decisions are being made based on political expediency, popular assumption, and human emotion rather than on biological dictates or scientific evidence. Science is the final arbiter when the BBCC makes a decision, which helps the 60+ member organizations reach consensus and

function as a powerful advocate for biological integrity when in the political arena. As Senator Trent Lott of Mississippi succinctly stated, "I've got forest industry, environmental groups, landowners, and state and federal agencies all asking me for the same thing. You better believe I'll give it (the BBCC) my utmost support" (Bullock and Wall 1995).

The fourth reason for success is the BBCC developed locally from the "bottom up" and has as its inner strength the commitment of its membership. Committee participants sincerely believe the best hope for black bear restoration in the region rests with the continued efforts of the BBCC, a sentiment stated in a letter from the BBCC to the FWS: "If restoration of the black bear is to be successful, we believe it will be through this new alliance of public and private interests working together solely for the sake of the resource and nothing else. The Black Bear Conservation Committee pledges to continue its role to that end" (Bullock 1994).

*Lessons.*—Innovative approaches in lieu of listing a species under the ESA, such as greater application of Conservation Agreements, also need to be explored as partnership efforts. Legislation could be written when the ESA is reauthorized to streamline and encourage implementation of pre-listing conservation strategies. This requires creation of a framework to involve stakeholders in applicable situations. The process could follow this format: 1) identify species of concern and reasons for decline or threats to the species' well-being; 2) establish a committee of major stakeholders who have the resources or control the land base providing habitat for the species; 3) the committee develops a plan of action, and signs a memorandum agreeing to implement species protection; 4) the FWS dedicates funds or existing personnel for a specified period of time to administer and coordinate committee efforts; and 5) should any stakeholder not live up to their commitment as outlined in the memorandum, or factors change that place the species in greater risk of survival, the FWS could trigger the emergency listing procedure (Bullock and Wall 1995).

The advantages of such an approach include: 1) more flexibility in management

options; 2) removal of an immediate regulatory burden; 3) removal of the threat of "incidental take" for private landowners; 4) restoration efforts move from the bottom up, rather than the top down; 5) cost effectiveness; 6) all willing stakeholders are equal partners; 7) no time constraint during the listing process, thereby reducing litigation; 8) species protection ensured; 9) participation by the private sector is promoted; and 10) possible application to address multiple species or issues on a landscape-level basis. Pre-listing management agreements would be particularly effective for wide-ranging species or species groups tied to specific ecosystems that cross multiple ownerships and wide geographic boundaries (Bullock and Wall 1995). Proactive partnerships also should encourage ecosystem management at the landscape scale, particularly when sustainable management of forested lands for multiple values is viewed as the key to avoiding intensive, crisis-driven efforts to find workable solutions (Sample 1994).

Bullock and Wall (1995) summarized Leopold's arguments as presented in the quotation at the beginning of this case example. Once identified, each species would be assigned a custodian—ranger, warden, game manager, chapter, ornithologist, farmer, stockman, or lumberjack. Public and private sector cooperation was viewed as essential, and Leopold's belief in the inherent nature of humans to be responsible stewards of the land and its associated natural resources gave rise to his optimism for the success of this approach.

A proactive partnership such as the BBCC is not unlike the strategy proposed by Leopold in 1936, because it would put the responsibility for species conservation in the hands of those that own or have management responsibility for the resource, oversee the process, and encourage creative management strategies. The BBCC is an example of the success of this approach, a model that when expanded to other ecosystem or landscape-based management strategies across multiple ownerships will result in a win-win situation for all stakeholder partners and, more importantly, for the species itself (Bullock and Wall 1995).

### Conclusions

The flexibility that currently exists in the ESA could be used more effectively. Mitigation of the factors causing endangerment before a species is listed is clearly the best strategy to avoid the necessity of an ESA listing. Why would we want to do this? There are at least three reasons. First, population levels are likely to be higher before listing becomes necessary; therefore, the chances of recovery are increased. Second, bringing in a regulatory agency to control all federal activities that might "jeopardize" a protected species invites slowdown and possible cessation of all ongoing land and resource

management activities including some that may not actually cause "jeopardy". Cessation occurs infrequently, but slowdown is a reality in many cases. When invoked, ESA consultation can lead to "paralysis by analysis." Activities may eventually be allowed to proceed, but only after lengthy and expensive analysis, monitoring, and negotiations with a regulatory agency. Third, adjusting resource management practices to meet the habitat needs of species at the local level through take flexibility is not only consistent with an ecosystem-based management approach, but can encourage the participation of non-federal landowners to benefit the species.



**Question 13. Is there an appropriate role for economics in the ESA?**

Economics is the study of the allocation of resources, and economic analysis offers information that can be useful to choose among alternatives. Can we afford to save all threatened and endangered species, whatever the cost, as the ESA mandates? That is a public policy decision that economic analysis can contribute to.

What, then, is an appropriate role of economic analysis in the ESA? The reply to this question begins by analyzing where economics is currently allowed in the ESA, how economic incentives could be used to help alleviate private property rights concerns, and then how economics could be used to identify cost-effective recovery alternatives that policymakers might choose.

**Economics and the ESA**

The Act has evolved since 1973 through amendments to the statute as well as changes in agency regulations. This section briefly traces the history of economics in the ESA, and then points out where economic factors currently may be considered.

*Historical Development.* As it was written in 1973 when signed into law by President Richard Nixon, the ESA had no provision for balancing species conservation with anything else, including economic activity. Indeed, in the very first words in the Act Congress declared that

various species of fish, wildlife, and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation. (ESA § 2(a)(1)).

Tracing the history of the impetus for the ESA, Mann and Plummer (1995*b,c*) found that the three people responsible for the drafting of the Act—Curtis Bohlen, Assistant Secretary of the Interior; Frank M. Potter, Jr., counsel for the Merchant Marine and Fisheries Committee in the U.S. House of Representatives, which had jurisdiction over endangered species concerns expressed in the earlier 1966 and 1969 precursors to the ESA; and Lee M.

Talbot, senior scientist at what was then the newly formed Council on Environmental Quality—purposely left out any balancing mechanism, and Congress passed the Act without recognizing the ramifications it would have. During an interview, Bohlen said,

As the bill drifted through the Hill and the other agencies and OMB [the Office of Management and Budget], there were probably not more than four of us who understood its ramifications. It was only sometime after its passage that they realized its implications. We certainly didn't advertise it. Why should we have? It was not our intent to ring alarm bells. (Curtis Bohlen, interviewed by Mann and Plummer 1995*b*).

The director of the U.S. Fish and Wildlife Service in 1973 later explained that many legislators did not realize the ESA would protect everything. They thought they were just voting to protect eagles, bears, and whooping cranes; they had no idea the Act would raise questions about irrigation projects, timber harvests, dredging of ports, or generation of electricity (Greenwalt 1991).

This has been confirmed by more than one member of Congress, including Sen. Mark Hatfield (R-Oregon) (Fitzgerald 1993). Former Rep. Paul Lenzini told Mann and Plummer (1995*b*) that few members of Congress had the "foggiest idea" what they were voting for. "There was no idea whose ox was being gored," he said, "so they all voted for it." In 1978 House oversight hearings, Former Rep. Trent Lott (R-Miss.) said,

I feel a great deal of emotion about this and a lot of anger. I was a member of this committee when the Endangered Species Act was first passed. I wish I had known then what I know now. I would have made an effort to prevent a lot of the problems. (Amendment to the Endangered Species Act: Oversight Hearings Before the Subcommittee on Fisheries and Wildlife Conservation and the Environment of the House Committee on Merchant Marine and Fisheries, 95th Cong., 2d 95-39 [Part I][1978] p. 59).

In 1973, a University of Tennessee fisheries professor discovered a new species of fish upstream from where the Tellico Dam was under construction. A law professor and

student petitioned for listing and the FWS listed the 3-inch snail darter as endangered in 1975. The petitioners filed suit to enjoin the TVA from further construction (Mann and Plummer 1995b). Two years later, in June 1978, the suit had worked its way through the judicial system and the U.S. Supreme Court made its first—and before June 1995 only—ruling on the ESA:

Congress intended endangered species to be afforded the highest of priorities.... The plain intent of Congress in enacting this statute was to halt and reverse the trend toward extinction, *whatever the cost*. (*TVA v. Hill*, 473 U.S. 174, 184 [1978], emphasis added).

With the "whatever the cost" phrase, the Court pointed out to Congress that it had created, as Mann and Plummer (1995b) put it, an "absolute duty to biodiversity." As a direct result of the Court's findings in favor of the snail darter and against the completion of the dam, Congress amended the ESA in 1978 by adding two provisions for including economic considerations in the Act:

- The Endangered Species Committee (now better known as the "God Squad") was created and given the authority to exempt federal projects from provisions of the ESA if the completion of the project is in the national or regional interest and the benefits outweigh those of compliance with the Act. The Chairman of the President's Council of Economic Advisors is one of the seven members of the Committee, and economic effects are the issues to be addressed by the Committee. (See ESA § 7(g)).
- The Service must designate critical habitat for each new species when it is listed, "after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat." (ESA § 4(b)(2)).

The procedures for conducting economic analysis during critical habitat designation were described by Souder (1993), a forest economist, who called this "economic balancing." Some observers believe that as the Service has written the regulations to implement the ESA, they have blunted the intention of Congress to require economic considerations through the designation of critical habitat (Tobin 1990, Houck 1993).

**Current Situation.** The ESA is often criticized because it does not allow economic considerations to enter into conservation decisions. Although Congress has specifically stated that economic factors are not to be considered in the listing process, there are specific places where economic factors are allowed:

- designation of critical habitat (ESA § 4(b)(2))
- "estimates of the cost" in recovery plans (ESA § 4(f)(1)(B)(iii))
- priority for recovery actions for species that conflict with economic activity (ESA § 4(f)(1)(A))
- identification of "reasonable and prudent alternatives" if a proposed project poses "jeopardy" (ESA § 7(b)(4)(B))
- exemption of a federal project from the ESA (ESA § 7 (g))
- accounting on a species by species basis for all "reasonably identifiable expenditures" for conservation activities, by federal agencies and recovery grants to states in an annual report to Congress (ESA § 18).

Informal and indirect economic analysis takes place in the listing process and in some cases has had obvious influences on listing decisions (Hyman and Wernstedt 1991). Using the case of the northern spotted owl, Thomas and Verner (1992) demonstrated that accommodation for socio-economic concerns occurred at every step of not only the implementation of the ESA, but also NEPA and the National Forest Management Act (NFMA). Particular to the ESA, these steps include listing decisions, designation of critical habitat, consultation on proposed activities, continuing search for alternative management approaches, recovery plan production, development of Habitat Conservation Plans, appeal for exemption of federal activities to the Endangered Species Committee, and consideration of exceptions to the recovery plan when unusual or unanticipated situations arise. Thomas and Verner (1992) stated that these accommodations were made at each step in the ESA process, likely in full recognition of the need for "balance." Souder (1993) provided additional detail on the use of economic considerations during these steps in the spotted owl case.

Beuter (1991), a forest economist, criticized

the spotted owl accommodations Thomas and Verner (1992) referred to, calling them "cursory consideration of social and economic impacts, with no input from other disciplines nor any attempt to balance biological and social and economic risks" (Beuter 1991, p. 9). A consideration of economics is not the same thing as using economic analysis (L. Eisgruber, review comments).

Eisgruber (review comments) observed that the ESA "frightens" some people. For example Jim Hawkins, Director of the Idaho Department of Commerce said, "The Endangered Species Act, to me personally, is just frightening," he told a meeting of Idaho's Chamber of Commerce representatives. Hawkins said the scare isn't so much in the original intent to save rare animals as in the unfolding implementation of the Act by the federal agencies and courts (Associated Press 1995e).

Eisgruber (review comments) said people are frightened because of the way the ESA takes economic considerations into account is not much of a protection against economic and job loss. So they want economics written into the Act in a more specific way. Others see economic concerns, such as economic growth and job creation, as the roots of the problem that ESA was designed to address, and as such, economic concerns should have no place in the act.

Some of those who want economics included in the Act want it included at the listing stage, but it is already there in critical habitat. Others who recognize that listing of species works best if it is based only on biological data have identified cost-effectiveness analysis in recovery planning as the appropriate role of economic analysis (L. Eisgruber, review comments).

### **Economic Incentives and Private Property**

To protect imperiled species, Mann and Plummer (1995c) recommended using markets and incentives, rather than the ESA's regulatory command and control approach. Elsewhere, economists (Anderson and Olsen 1993; Baden and O'Brien 1993; Goldstein 1991; O'Toole 1993, 1994; Seasholes 1995), conservationists (Hudson 1993, Fischer et al.

1994), and others (Kunich 1994; Keystone Center 1995; see Stone 1995) have endorsed similar incentives-based approaches to endangered species problems.

Polasky (1994) suggested economic analysis as a way to get around the clash of values resulting from species conservation and private property rights.

**Economic Efficiency.** Economic analysis is concerned primarily with efficiency, which can be welfare efficiency or technical efficiency. Economists consider an outcome to be efficient if it is impossible to increase the welfare of any individual or group without simultaneously lowering the welfare of others. Efficiency is not the same thing as an increase in employment or income. Some decisions that increase employment and income may be inefficient (Polasky 1994).

For example, Polasky (1994) said using unemployed loggers to clearcut old growth forests might increase employment and income, but lower social welfare overall if the value of *all* the costs exceed the value of *all* the benefits of cutting the forest. Even those costs and benefits that cannot be valued by market transactions, such as the value of walking in an old growth forest or knowing that certain species are conserved, must be included in the efficiency analysis (Polasky 1994).

Technical efficiency measures the relationship between costs and benefits. The benefits of species conservation are quite difficult to measure. Although there have been a number of studies that estimate the willingness of individuals to pay to protect species, answers to such questions are clouded by feelings of what is a fair share and the worth of a good cause rather than with the value of the existence of the species itself (Polasky 1994). In practice, measuring non-market values is difficult, but once these values are determined, the relative importance of species conservation versus other goals can be determined and efficient solutions found.

**Property and Incentives.** Economic analysis can help to resolve the property "taking" issue. The standard economic approach to the "takings" issues comes from Nobel laureate

Ronald Coase (1960), who said as long as the two parties in an environmental dispute can bargain or trade with each other, an efficient outcome will occur.

The ability to bargain or trade is essential for efficiency. Whether one party initially had a right to damage the environment or is now enjoined from doing so is unimportant for efficiency. Suppose, for example, that property owners have rights to do whatever they wish, even if their actions may lead to the extinction of some species. If the wildlife trustees (a government agency or conservation group) believe it is more important to prevent harm to a species than for the property owner to carry out her intended action, a bargain can be struck in which the wildlife trustees pays the property owner not to do the action that would harm the species (Polasky 1994). As another example, suppose that no property owner has the right to harm an endangered species. A property owner wishing to undertake an action that harmed an endangered species would have to offer the wildlife trustees compensation in some form that more than offset the harm done to the species (Polasky 1994).

In either case, if species conservation is more valuable than actions inconsistent with conservation, conservation will occur, otherwise it will not. Defining property rights will affect the distribution of rewards between property owners and the wildlife trustees, but property rights will not affect whether an efficient amount of conservation takes place (Polasky 1994).

Despite these results, conservation will generally be a function of which party is granted property rights. Defining property rights in a different manner will change the wealth of the private property owners and the wildlife trustees. Granting rights to property owners means that payments will have to be made for any conservation program that harms the economic interests of a property owner. Because compensation must be paid, the budget for the wildlife trustees will be highly constraining. Unless the wildlife trustees can increase their budget sufficiently, less conservation will occur when rights are given to private property owners (Polasky 1994).

This discussion implicitly assumes that both

landowners and wildlife trustees are fully informed about all relevant aspects of the issue. In particular, this means the wildlife trustee would know about all of the species that dwell on a parcel of private property, as does the landowner. That is seldom the case. More realistically, the wildlife trustee has very little knowledge about what species exist on which parcels of land (Polasky 1994).

Incentives to obtain information about species whereabouts are quite different under the two different property rights regimes. Under the current ESA, landowners have perverse incentives to "shoot, shovel, and shut up" (Polasky 1994; see also Seasholes 1995). Hiding information about the location of endangered or threatened species from government employees can save landowners money and regulation-induced headaches. Under the alternative approach, government compensates for species conservation actions taken, and there is no incentive to hide information, as long as compensation reflects the lost value to the landowner. Gaining trust and cooperation from landowners is an important element of a successful conservation program. Using carrots instead of sticks, while more expensive, has the advantage of securing cooperation (Polasky 1994).

This discussion also assumes that the costs of information and enforcing property rights (transaction costs) are absent or negligible. This is probably not the case because of the amount of information needed to protect biodiversity and the legal costs of enforcing property rights. Somehow transaction costs have to be split between the property owners and the wildlife trustees in order to produce an efficient solution. Nevertheless, giving private property owners the right to compensation is likely to improve the flow of information and the degree of cooperation between private property owners and wildlife trustees. However, it will also drain wildlife trustee budgets. In all likelihood, going this route would lower the total amount of conservation activity but might allow conservation to be better targeted (Polasky 1994).

The idea of incentives for private landowners to engage in species conservation has strong support from the conservation community. A publication by the Defenders

of Wildlife (Hudson 1993) highlights many good arguments and approaches for such incentives, including a Biodiversity Trust Fund. Implicit in the idea of public subsidies for private action is that the public benefits from it. A Keystone Center (1995) report also highlights the role of economic incentives (see Stone 1995).

### **Economic Analysis and Recovery Planning**

What role should economic considerations play in species conservation decisions? Should actions that increase the risk of extinction or inhibit recovery from threatened or endangered status be allowed because of economic factors? Can actions affecting species conservation be regulated on private land to the same degree as they are on public land? These controversial issues are now on center stage as a result of spotted owl conservation efforts in the Pacific Northwest (Polasky 1994).

The question is not so much whether economic analysis is appropriate in the ESA, but what type of economic analysis is appropriate, where it ought to occur, and how it ought to be used. Under the current ESA, economics is interjected in a haphazard way, and a broad-based economic analysis is neither mandated nor prescribed for any ESA decision-making process (L. Eisgruber, review comments).

***Biological and Non-biological Factors in the ESA.*** There is a lack of interdisciplinary communication on problems of natural resource policy (Castle 1993). Non-economists tend to reject the potential contribution economics can make. Part of the problem may be that by failing to consider the philosophical underpinnings of the discipline of economics, some economists take a too-narrow approach to problems with economic dimensions. By improving interdisciplinary dialogue, values are brought into the open and their contribution to scientific approaches to policy can be evaluated. These value preferences must be explicitly recognized if natural resource management policy is to become more reliable (Castle 1993).

This section briefly analyzes the tension evident in species conservation policy from

different scientific and ethical viewpoints. Recognition of the contribution economic analysis can make to societal concerns about the ESA could make for a more reliable policy by freeing biologists to focus strictly on biology.

Using the spotted owl situation, Thomas and Verner (1992) demonstrated that economic concerns are interjected into every phase and process of ESA implementation, leading to a dilution of biological needs through political second-guessing or overt political pressure on agency biologists or administrators. Tear et al. (1993, 1995) suggested that the interjection of economic concerns is not restricted to the spotted owl case (J.M. Scott, review comments).

The ethical foundation of the ESA is based on a blend of human-centered and biologically-centered perspectives, and is dominated by the latter concerns. Eisgruber (1993) argued that the ecocentric orientation of the Act is the root cause of implementation difficulties.

The ecocentric ethic says that ecosystems must remain intact for life as we know it to survive and prosper. The mandate for conservation of all local populations of species no matter what the cost, Eisgruber (1993) said, is simply out of touch with his perception of reality. When it is recognized that this goal may not be attainable, an anthropocentric feature—economics, or resource allocation—comes into play.

Economics deals with making choices. The ESA mandate to conserve every local population no matter what the cost allows no choice. Under these circumstances, the only contribution economics can make is to provide information about the most cost-effective alternatives. Even this is controversial, and the law does not provide for such an approach.

It is not only the level of costs that matter, but also their distribution. Even the most cost-effective alternative to conserve a local population can be more costly than is acceptable to society. This is why Congress created the Endangered Species Committee.

Eisgruber (review comments) stated that because the ESA is ecocentric, it is a fundamentally flawed law that fosters uncertainty, distrust, and perverse incentives. Lind (review comments) warned against

accepting the anthropocentric argument too readily because there is considerable support for the ecocentric argument. At this point the discussion reverts to the question, does the ESA place animal welfare ahead of human welfare? (See Question 9). An important question, to be sure, but one best left to philosophers.

Castle (1993) noted that these philosophic approaches help illuminate the values and choices inherent in natural resource and environmental policy. However, he pointed out that no single environmental ethic or philosophic system is likely to provide natural resource policy guidance because such policy is necessarily pluralistic. Because pluralism does not resolve inconsistencies, policy must be pragmatic to allow making choices to resolve value conflicts (Castle 1993).

As a practical matter, the ESA mandates the recovery of all species, whatever the cost. Service employees, regardless of their philosophical orientation, need resources to do their job, and Congress simply does not provide enough resources to do what the law says must be done. As a result, biologists become economists (defined as "resource allocators") and are forced to compromise what they feel are the biological needs of species. The compromise between biological needs and social and political reality in the spotted owl case was described by Thomas and Verner (1992) and confirmed by Souder (1993) and Scott (review comments).

Is there a problem here? If biological needs are compromised, then the ESA goal of species recovery is also compromised for short-term expediency. If biologists make the compromise, as they apparently do, the entire ESA process becomes one of political gamesmanship. Biologists are in the position of having to make decisions, based solely on biology, that have non-biological consequences both for society and the Service. If society does not like the decisions, it may blame the biology, declare it irrelevant, and proceed to make decisions with increasingly less input from biologists. This certainly would not further the goal of the ESA to recover species.

A meaningful insertion of economic analysis into the ESA would allow biologists to focus on biology, and economists working in

conjunction with biologists to develop cost-effective conservation alternatives upon which someone would then make a resource allocation choice. (Who that would be is a political choice.) Economic analysis can be done more meaningfully if biologists describe their goals in terms of population persistence, and then identify different means for obtaining different levels of persistence in terms of population numbers and risks of extinction. Biologists also need to identify critical habitat and population persistence probabilities associated with alternative habitat mixes. Then economists could assist in developing cost-effective analyses. This is covered in some detail under Question 15, alternative 4.

***Economic Analysis and Uncertainty.*** As biological science is dependent on the social sciences (Soulé 1985), economic analysis is dependent on biological science to describe desired goals and means to attain them. Economic analysis can then be applied to help policymakers eliminate inefficient alternatives and identify those with preferred patterns of distributional consequences; that is, who will benefit and, more important in ESA recovery planning, who will pay the costs. Thus economic analysis can be a balancing mechanism between biological needs and social preferences.

Economics is concerned with the allocation of scarce resources. The use of economic analysis in species conservation thus takes a decidedly anthropocentric (or people-centered) approach to problems, and those with an ecocentric ethical perspective may disdain the application of economic analysis to species conservation.

According to Polasky (1994) all policy decisions involve economic considerations, either explicitly or implicitly. The "balancing" question becomes, if economic factors are to be considered explicitly, what weight should they be given in species conservation policy? Economists will argue that the weighting should reflect the aggregate desires of members of society because policy choices are social decisions. That may mean greater efforts are made for certain species, such as bald eagles, and minimal efforts are made for other species, such as plants and invertebrate

animals that do not perform important ecological or economic functions. Objective evidence on which species are more valuable than others or the relative importance of species conservation versus other goals is difficult to come by because there is no generally accepted approach to these problems. Lacking objective evidence, the issue of how to balance economic and ecological factors will be debated indefinitely (Polasky 1994).

The most difficult policy choices are tradeoffs between various goals. That is, when increasing species conservation efforts come at the cost of reduced economic activity, or increasing economic activity comes at the cost of increasing risks of extinction (Polasky 1994). Because a high degree of uncertainty characterizes any biological or economic analysis, uncertainty must be explicitly addressed by analysts in all ESA deliberations (Hyman and Wernstedt 1991).

Most of the economic uncertainty is associated with the recovery planning process (Hyman and Wernstedt 1991). In most cases analysts can make reasonably accurate estimates of the direct cost of recovery actions; for example, the cost of bypass systems that divert salmon from turbines in hydropower dams. Analysts are on shaky ground when they attempt to predict the adjustments that economic interests may make in response to recovery actions; for example, the decreased availability of irrigation water in salmon conservation efforts (Hyman and Wernstedt 1991).

Biological and economic uncertainty traditionally have been used to argue against certain actions and delay their implementation. To avoid extinction, delay must be avoided, thus there is some urgency regarding biological and economic analysis. Decision makers must accept uncertainty and incorporate it into their decision processes (Hyman and Wernstedt 1991).

**Cost-effectiveness Analysis.** Biological analyses should, as Hyman and Wernstedt (1991) demonstrated, be stated in terms of a probability statement that a mitigation action will have on the expected fate of a species. Probability can be described as the risk of extinction and set at a minimum level.

Economic analyses should be approached in terms of cost effectiveness, which avoids the issue of evaluating benefits by searching for the lowest-cost ways of achieving objectives. In combination, these two approaches create for decision makers a "frontier" of cost-effectiveness actions that highlight higher marginal costs associated with ensuring greater survivability of species (Hyman and Wernstedt 1991).

Figure 13-1 demonstrates a hypothetical case. At some point, the small increase in survival probability may not justify a large increase in the costs to obtain it, such as moving from point B to point C. If this probability-based approach is infeasible, the horizontal axis could represent the production of additional animals or plants instead of the probability of survival (Hyman and Wernstedt 1991).

The cost-effectiveness approach can be applied in situations other than that demonstrated in Figure 13-1. The results of an analysis conducted by Taylor et al. (1994) indicated the potential for a multi-species recovery plan approach to be more cost-effective than a single-species approach in meeting recovery goals within the Clinch River Valley in Tennessee. The multi-species plan involved 32 species of freshwater mussels and 13 species of fish listed as threatened or endangered at the state level, of which 13 are listed under the federal ESA. The analysts were agricultural economists, and they concluded that the current single-species approach to conservation results in higher costs than necessary, and possibly less species recovery. They stated that the ESA needs to be reformed in a way that will lower the cost of species protection and recovery without increasing risks or lowering benefits. The multi-species recovery plan approach shows promise as a cost-effective vehicle for such a change (Taylor et al. 1994).

### Economics, Sustainability, and Ethics

Eisgruber (1993) argued that species conservation is related to the broader and far more fundamental issue of sustainable development. The ESA may need revision to become more philosophically aligned with the

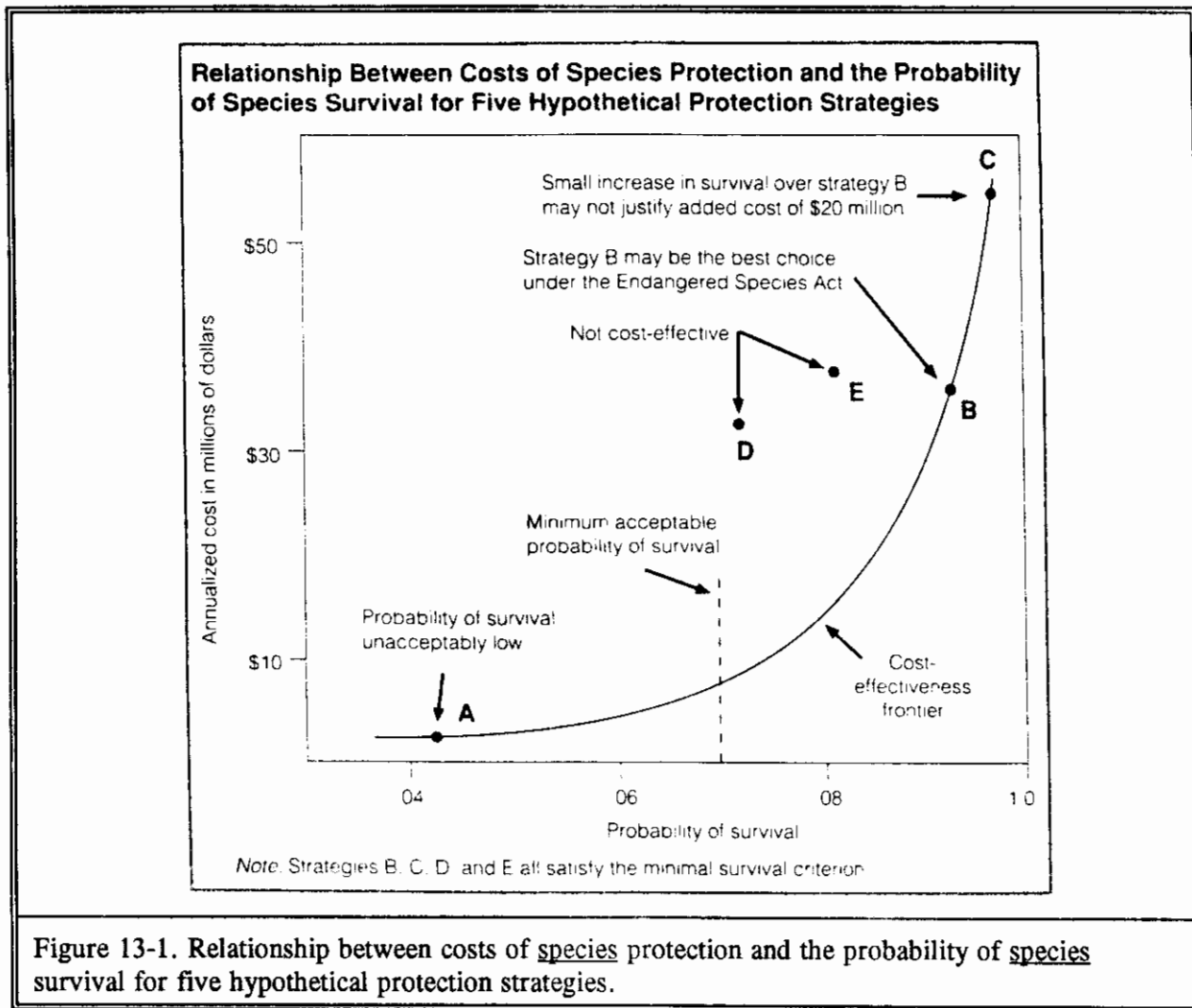


Figure 13-1. Relationship between costs of species protection and the probability of species survival for five hypothetical protection strategies.

Source: Hyman and Wernstedt (1991).

more comprehensive and compelling outlook of sustainable development. This will require economics to play a much more prominent role in species conservation policy than it has in the past two decades. Current implementation of the ESA requires species conservation at all costs. Economists (including Solow et al. 1993, Polasky 1994) have argued that all species should not be viewed as equal, and economics can play a role in this process of choice (Eisgruber 1993). Otherwise, as Harrington (1981) pointed out some time ago, species conservation must ultimately be based on ethical rather than economic grounds.

A sustainable society needs to be concerned about its ecology as much as its economy, and vice versa. Eisgruber (1993) argued that an ecocentric ethic ignoring economic

considerations poses a number of difficult dilemmas. Among other things, such an ethic places humans in the awkward position of being a species that is not inherently superior to other living things and simultaneously being a "supergod" (see Mann and Plummer 1992) responsible for protecting all other species from extinction (Eisgruber 1993).

That 99% of all the species that have lived on Earth have gone extinct supports this argument, but is not adequate justification for uncaringly allowing species to go extinct from avoidable human impacts. The question is the estimate of survival risk. Such science-based estimates can be used along with morally-based arguments for species conservation. Economists will not be able to contribute until that has been done.



When Congress declared that "various species... have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation" (ESA § 2(a)(1)), it meant to interject concern for the possibility of extinction into economic development decisions. Congress included no provisions in the ESA to balance concerns for extinction with development, and that is why the ESA is so controversial. It makes species conservation an overriding goal. This ecocentric perspective is problematic.

Eisgruber (1993) concluded that ecocentrism is a poor foundation for public policy, laws, and actions. A consideration of economics in the ESA would contribute to resolving the Act's insensitivity to inequitable distribution of costs, which is related to the potential for encroachment on property rights (Eisgruber 1993).

Some people believe more economic analysis would provide additional balance, but

it is unlikely that additional analysis would reduce the divisiveness of species conservation issues. The principal issue is allocation of limited resources (L. Eisgruber, review comments). Economics only provides information about the consequences of alternative allocation strategies, it does not make the decision on how to allocate. Society does that through the political process. The conflict is between ecology and other societal goals, not between ecology and economics (L. Eisgruber, review comments).

### Conclusions

The meaningful interjection of economic analysis into the ESA would not necessarily dilute the original intent of Congress. It would instead provide additional information that policymakers could use as they chose. The logical place for economic analysis in the ESA is recovery planning.

### Question 14. What roles should agencies play in the ESA?

There have been tensions between the federal and state roles in species conservation prior to, during, and after the enactment of the ESA. After 22 years of experience with the ESA, most observers agree that more cooperation between the federal and state agencies would be better for people in affected regions as well as imperiled species.

#### Federal "Service" Agencies

The roles of the NMFS and the FWS in meeting the species recovery goal of the ESA were described in Question 2. Experience in Idaho suggests that the NMFS should concentrate its efforts in species conservation on regulating the commercial harvest of marine fisheries, and the agency's role of regulating freshwater fishery habitat management should be shifted to the FWS.

The salmon case example (**Appendix B**) illustrates that the NMFS is not very well equipped to be make decisions about how freshwater habitats for salmon are "jeopardized" by logging, mining, grazing, and recreation activities. The FWS may not be any better equipped to make those decisions, but it seems inefficient to have two federal agencies with overlapping jurisdictions alongside streams and rivers capable of supporting salmon. One might also conclude, based on the salmon consultations in Idaho, that the NMFS is an unnecessary redundancy in Idaho, and those tasks could be performed more effectively and efficiently by the FWS.

The NMFS was given the responsibility for regulating the commercial harvest of salmon in 1970 when the agency was created. When it passed into law in 1973, the ESA did not change these agency responsibilities.

Because salmon spend a portion of their lives in fresh water, the NMFS follows them from the marine environment into the estuary, then upstream through the Columbia River, past its four hydropower dams, into the Snake River, past its four hydropower dams, then upstream into Idaho to Snake River tributaries where the salmon spawn in the stream gravel. Juvenile salmon hatch and swim up through

the gravel, then spend upwards of a year in the stream before they begin the downstream migration to the ocean. Here they will spend two or three years (or sometimes four or five) before the cycle repeats itself. The NMFS is responsible for protecting the fish throughout their life cycle, even though other federal and state agencies manage salmonid fish in the same streams. But transferring the NMFS' inland responsibilities to the FWS is not a complete solution to the salmon situation, because the FWS has its own problems.

Opdyke (1993), formerly employed by the FWS, said for the most part, the FWS's role in wildlife conservation is that of advisor. Most recommendations by the FWS tend to be ignored until a species is listed and the protection of the ESA is mandated. The role of the FWS then changes from "irritating and bothersome gadfly" to land-use regulator. It has been difficult for the FWS to adjust to this new role and make the necessary internal changes in expertise, funding, and responsibility. In most areas of the country, the FWS may have the staff to function as a "gadfly," but the agency is not configured to be a responsible regulator. To help stimulate wildlife conservation on non-federal lands, it is necessary to strengthen the FWS's competence and timeliness in regulating take, coupled with improving its ability to help the public craft conservation plans to restore species before listing and recover species after listing. The authoritative, regulatory approach of the ESA is "absolutely debilitating" because it keeps the FWS from pulling a chair up to the table to resolve conflicts and set the direction of conservation and recovery (Opdyke 1993).

Opdyke (1993) offered recommendations as directions of positive change for the FWS, thereby improving communication and cooperation from the federal government. Most of them involved increased funding and staff resources.

#### State Agencies

As previously mentioned, state endangered species programs provide a needed first line of defense. In Idaho, state lists of imperiled species outnumber federally listed species. This is an important aspect of state programs

not only from the species conservation point of view, but also from a cost-effectiveness point of view. It is generally much less costly to reverse the decline of a population early in the cycle than it is to recover a population that has fallen below a viable level.

**Stronger State Involvement.** At a continuing legal education seminar in May 1993, Clive Strong, Idaho Deputy Attorney General, National Resources Division, said the importance of state involvement in the ESA cannot be overemphasized. State involvement will help bridge the communication gap between the regulatory agencies and the regulated community (Strong 1993). Sixty-seven percent of state ESA administrators responding to a survey by Melquist (1995) felt their roles in species recovery and management should be greater.

Strong (1993) reiterated what an Oregon fisheries biologist had said at the May 1993 meeting: The ESA is good at identifying the problem, but not identifying the solution. Due to inadequate funding, the ESA has not achieved its objectives of species conservation. Melquist (1995) found that 97 percent of state ESA administrators disagreed that federal funding was adequate to carry out recovery efforts in their state.

Strong (1993) said that it was important to remove the advocacy aspect of science that drives the ESA. Somehow, he said, a coordinated recovery plan on the Snake River is necessary, because of salmon and snails. He also pointed out that none of the ESA cases he has dealt with have been solved, indicating that the courts don't work. Courts, however, cannot be expected to solve ESA problems, but just to re-order priorities and set agency direction (M. Feldman, review comments). Strong (1993) concluded his remarks as he began them: The importance of state involvement in the ESA cannot be overemphasized. However, there is no evidence that states could have done better than federal agencies have (T. Bjornn, review comments).

One potential drawback to a state-level endangered species program is commitment. State fish and game commissioners and the state fish and game agency budget are

primarily focused on game species and related management concerns. Nonetheless, there are other possible advantages to a state-level endangered species recovery program. First, control of recovery planning and associated impacts can be retained at a local or regional level. This is likely to provide for greater flexibility in recovery plans, greater efficiency in review of actions that may affect a listed species, allow more participation in the process by affected individuals, and result in a deeper understanding of the needs of both the endangered species and the humans that occupy an area (Graham 1993, McKinney et al. 1993). Eighty-six percent of the state ESA administrators surveyed by Melquist (1995) felt that state and Service field offices have a much better understanding than the regional office as to which projects need funding.

Providing state wildlife agencies more responsibility for designing and implementing recovery plans, especially section 10 habitat conservation plans, may increase the willingness of private landowners to cooperate in conservation efforts, as state wildlife agencies frequently work closely with landowners in game management and have long-established relationships with landowners (McKinney et al. 1993). State agencies have not always found the FWS (Graham 1993) or the NMFS (B. Horton, pers. comm.) receptive to planning efforts by the states (see Melquist 1995).

Graham (1993) listed 9 ways in which incentives or removal of disincentives for state fish and wildlife agencies could be accomplished during the ESA reauthorization process:

1. Consider an ESA State Primacy Program similar to the way EPA handles the Clean Water Act.
2. Section 6 funding should be dramatically increased (while overall ESA funding tripled from 1981 to 1990, section 6 funding increased only 70%).
3. Provide specific authorization and funding for cooperative management agreements with state agencies, local governments, and private entities.
4. Provide that a state restoration plan, once determined to be adequate by FWS, should stand in lieu of a completely separate effort by the FWS.
5. The current ESA approach of basing funding priorities on the number of species listed

promotes listing, not recovery or prevention. Funding should be based on expected cost of recovery or the number of native habitats occupied.

6. The ESA should be made flexible enough to allow testing of more compelling or innovative suggestions for species recovery.
7. More clarity needs to be given to distinguish between truly endangered and threatened species.
8. Failure to delist species creates a credibility gap for the ESA. The ESA will continue to be treated with suspicion until a successful recovery plan results in recovered populations and delisting.
9. Peer review of listing decisions, if required, should incorporate state expertise and personnel. (Graham 1993)

When Congress enacted the ESA in 1973, its intent was to protect and recover threatened and endangered species. Graham (1993) said the Montana Department of Fish, Wildlife, and Parks strongly supports that intent. Based on that agency's experience and the experience of others, he concluded that the administration and implementation of the ESA is not living up to the laudable goals of protection and restoration. He cited the paucity of delistings as evidence. The settlement agreement in *The Fund for Animals v. Lujan* guaranteed accelerated ESA activity for hundreds of species at a time when there is growing pressure to reduce the federal deficit. Although Congress in April 1995 temporarily alleviated the problem by imposing a moratorium on new ESA listings, the underlying problem of declining species populations and habitat modification continues. Increasing state responsibility for ESA implementation could help relieve some of that pressure.

#### ***Western Governors' Association***

***Recommendations.*** At the 1992 Western Governors' Association meeting, former Idaho Governor Cecil Andrus and former Montana Governor Stephens sponsored a position statement on reauthorizing the ESA. The governors supported greater state authority and flexibility in spending ESA section 6 funds. The IDFG believes the state needs greater latitude in expending these section 6 funds (Melquist 1993b). In 1993, the Western

Governors' Association supported the amendments to the ESA proposed by Senators Baucus (D-Mont.) and Chafee (R-Rhode Island), and Rep. Studds (D-Mass.). These proposals would have given states and private property owners greater voices in species protection (*Idaho Statesman* 1993b).

In April 1995, the 16 members of the Western Governors' Association (WGA 1995) developed a 12-page proposal for amendments to the ESA. The three essential elements for revisions to the Act were based on three goals: increase the role of the states, streamline the Act, and increase certainty and assistance for landowners and water users (WGA 1995).

According to Wayne Phillips (1995), counsel to the WGA,

fundamental to the Governor's reauthorization principles is what they envision as a revitalized recovery planning process. Such a recovery plan would bring stakeholders to the table, and is the only way, the Governors insist, to achieve true ESA success. (Phillips 1995).

To increase the role of the states, the WGA (1995) insisted that the ESA and its implementation must clarify, affirm, and enhance the federal-state partnership. The WGA had six recommendations of general principles for reaffirming the state role, and three recommendations for funding the states' assumption of ESA activities. To assume more responsibilities under the ESA, funding should be provided. The WGA recommended 1) redistribution of federal ESA appropriations to the states, other than section 6 grants, for states assuming functions that federal agencies would otherwise do; 2) appropriate Land and Water Conservation Fund monies for ESA purposes as block grants to the states to facilitate private landowner and water-user involvement in Conservation Agreements and recovery plans; and 3) use of Sikes Act revenues generated from federal land-use fees for ESA purposes (WGA 1995).

To streamline the ESA, the WGA made 9 recommendations to improve management of the listing process, 3 recommendations for the section 7 consultation process, 9 for the development of recovery plans, 2 for delisting, and 2 for improving conservation provisions, including a series of six items that would differentiate between threatened and

endangered status in regulatory practices (WGA 1995).

Increasing certainty and assistance for landowners and water users received attention, with 12 recommendations in four different categories (WGA 1995).

In total, the WGA (1995) recommendations were designed to be politically attractive enough to win approval in the United States Senate (Phillips 1995).

***The International Association of Fish and Wildlife Agencies Recommendations.*** The IAFWA concurred with the WGA's 1992 recommendations and developed a position paper on reauthorizing the ESA (IAFWA 1993). According to the IAFWA position paper, states share jurisdictional authority for listed species, which is executed through a section 6 cooperative agreement with the FWS. State fish and wildlife agencies, however, are not adequately included in the implementation of the Act. There is a vital and necessary role for the state agencies to play, including:

- status review of candidate and proposed species,
- reviews of listing packages,
- members of recovery teams,
- drafting recovery plans,
- designation of critical habitat,
- implementing recovery efforts,
- consultations,
- approving Habitat Conservation Plans for ESA section 10 "incidental take" permits (IAFWA 1993).

The IAFWA also supported increased funding for all aspects of the ESA, especially section 6 funds. However, Congress must also financially support the federal agencies charged with implementing the Act, and support state, local government, and private concerns to facilitate the recovery and monitoring of threatened and endangered species. Finally, the IAFWA supported funding of the 1980 Fish and Wildlife Conservation Act to provide additional, necessary funds to the states for the management of nongame fish and wildlife and their habitats. This would facilitate a conservation safety net before it becomes necessary to impose the ESA mandates to preclude species extirpation or extinction.

The message from WGA and IAFWA seems

clear enough. State fish and wildlife management agencies are in the business of wildlife conservation and have substantial resources already committed to the task. More cooperative efforts on the part of federal agencies, particularly the FWS, would be welcomed, especially if they involved sharing of knowledge from the states to the federal authorities, and more funding and flexibility with available funds from the federal authorities to assist the states with the difficult and important tasks of species conservation. The counter argument will always be that the states lack commitment to all but game species. The situation in Idaho may be different because of the state's commitment to the Idaho Conservation Effort (see Question 8) but tension will always exist between the purposes of state and federal wildlife conservation.

***Cooperative Agreements.*** Early efforts to manage for the needs of candidate species could allow the FWS to seek opportunities for federal and non-federal entities to stabilize and recover these species and maintain their habitats before ESA listing becomes a high priority. By addressing the needs of candidate species, the Service and other federal and non-federal entities may retain management flexibility, reduce conflict with development, minimize the costs of recovery if listing is pursued, and sometimes alleviate the potential need for restrictive land-use policies in the future. Instituting actions for a species while it is still has candidate status can help avoid the confrontational atmosphere often encountered during and after ESA listing. Greater efforts in addressing the habitat needs of candidate species before their status becomes threatened or endangered may be a reasonable way to preclude the need for ESA listing.

A potential opportunity to demonstrate flexibility and a more effective relationship between state fish and wildlife agencies and the federal agencies in implementing the Act may lie in the area of multi-species cooperative agreements. Eighty-six percent of state ESA administrators surveyed by Melquist (1995) supported placing a greater emphasis on multi-species and ecosystem projects. As the list of

endangered and threatened species grows, a shift from the single-species approach to one of multiple-species may be a desirable strategy.

The IDFG has made a shift in their approach to ESA recovery and management (Melquist 1993b). The IDFG, working with Region 1 of the FWS, has received funding through section 6 grants to examine ecosystem-oriented projects involving endangered, threatened, and candidate species in both the Bitterroot and Selkirk Ecosystems (IDFG 1994). For example, caribou, grizzly bears, and a variety of other imperiled species are found in the Selkirk Mountains, causing the IDFG to examine how to shift their conservation focus to the Selkirk ecosystem and how these various species interrelate. Melquist (1993b) stated that a way to look at where we must go in conservation of species is, "What we do for one species usually benefits others." As a result, IDFG has consolidated the Selkirk caribou and grizzly bear projects, thus reducing the overall cost of managing recovery. The IDFG believes that shifting from single-species to addressing entire communities and ecosystems is a more cost-effective approach to recovery and protection (Melquist 1993b).

***IDFG Office of Rare Plants and Animals.*** In 1994, the Idaho Legislature considered a bill that would have created an Office of Rare Plants and Animals in the IDFG. The office was proposed to have a \$500,000 budget, with \$139,900 from the general budget, \$31,300 from the Idaho Fish and Game Fund, and \$322,000 from the federal government. The proposal included 3 full-time positions and 36 employee-months for seasonal wildlife technicians (Wickline 1994b). The bill passed the Senate (Wickline 1994c) but did not pass into law.

What would be the advantages and disadvantages of such an office? The principal advantage would be to keep additional species from being added to the federal list by proactive information gathering and the development of Conservation Agreements. The disadvantage is that under the current ESA, the federal agencies can ignore state-based activities. Even if there were a strong

contractual commitment on the part of the state, it would not relieve the federal agencies from their ESA responsibilities. A change in section 6 of the ESA would likely be needed to make such a state program worthwhile.

***Idaho Endangered Species Act.*** If section 6 of the ESA were slightly amended to give the states a lead role instead of just a cooperative role that the federal agencies could choose to ignore, some assurance would likely be needed to demonstrate that the state would take its lead role seriously. Depending on how it is designed, a state endangered species act could fill that need.

***Other Idaho ESA Considerations.*** One potential area in which the IDPR could become involved is acquisition of lands that provide habitat for imperiled plant species. Such acquisitions could be accomplished in several different ways. One is by direct purchase. Another is through land exchanges with the Idaho Department of Lands. This could potentially relieve pressure on wildlife habitat areas stemming from the requirement in the Idaho Constitution that state endowment trust lands be managed for "maximum long term financial return." A third way is land exchanges involving a third party such as the Nature Conservancy or Trust for Public Lands. Without requiring significant restructuring of the IDPR or dramatic increase in the amount of land the agency administers, this approach could provide protection for imperiled plant species that have localized populations.

## Conclusions

Some modification of agency roles under ESA would benefit imperiled species as well as humans, who pay the costs of recovery. At the federal level a different division of responsibility between NMFS and FWS is perhaps appropriate. The FWS is better equipped to make the inland land-use decisions that affect salmon, but NMFS currently has that authority. The Idaho Department of Fish and Game already manages most of the state's wildlife. State agencies may be better prepared than the federal government to take

the management actions necessary to prevent species from being listed and the conservation actions to recover already listed species. In these times of uncertain federal budgets, cooperation between all levels of government is essential to meet the high ideals of the ESA.

### Question 15. What alternatives are there for changing the ESA?

Many of our country's laws must be reauthorized by the U.S. Congress every few years; the ESA is one of those laws. Reauthorization is mostly about Congress granting continued spending authority for the ESA, but it also provides an opportunity to open up the entire ESA can of worms during debate. Multi-year reauthorization for ESA was scheduled for 1992, and is now more than 3 years overdue. Meanwhile, the ESA has been funded by a tactic called continuing resolution, when Congress extends the previous spending authority on a year-by-year basis through the federal budgeting process.

Referring to the possibilities of reforming the ESA during reauthorization, Barry (1991), formerly an attorney with the FWS, called the ESA an "immovable object" likely to endure with only modest alterations for many years to come. He cited several reasons why: 1) committee jurisdiction is everything, 2) it is easier to do nothing than it is to do something, 3) it's better to move no bill than to move a bad bill, and 4) you need a point of leverage to move an immovable object. Given strong public support for the idea of the ESA, the point of leverage for modifying the ESA is not immediately obvious, although some would say it is the power the ESA gives federal agencies to affect land-use decisions on non-federal lands and resources through regulatory powers. Maxims 2 and 3 above are irrefutable. The committee jurisdiction for the ESA has changed since the Republican tide swept through Congress in November 1994, and both House and Senate committees with ESA jurisdiction held hearings on the ESA during the first half of 1995.

At one of these hearings, on June 3, 1995 in Lewiston, Idaho, Sen. John Chafee (R-Rhode Island), who chairs the Environment and Public Works Committee, said

while the ESA will be amended, it is safe to say it will not be repealed or gutted. Most Americans ... support the conservation of fish and wildlife and maintenance of a healthy environmental. However, they want our environmental laws to be less burdensome and more effective. (Titone 1995a).

Senator Chafee, in June 1994, called the ESA "a terrific law," and referred to its historically strong support in the Senate (Laussy 1994). His leadership in the Senate could produce and move a bill with substantial changes in the ESA. Senator Dirk Kempthorne (R-Idaho) chairs the subcommittee that produced a bill in October 1995. In May 1995, Sen. Slade Gorton (R-Wash.) introduced a bill to modify the ESA. In the House of Representatives, Rep. Helen Chenoweth (R-Idaho) is on the newly-created Resources Committee, chaired by Rep. Don Young (R-Alaska). Rep. Chenoweth is a member of the committee task force given the responsibility for drafting a bill, which did occur in September 1995.

The prospect of amending the ESA raises the question of what might happen during reauthorization, a subject ripe for policy analysis and the focus of this chapter. However, this analysis does not include an evaluation of current congressional proposals.

The Idaho Forest, Wildlife and Range Policy Analysis Group (PAG) was reauthorized by the Idaho Legislature in 1994 (*Idaho Code* § 38-714). This legislation mandates that the PAG identify a range of alternative actions and analyze their relative merits. Information in this chapter suggests several alternative courses of action that could be taken to meet the national goal of protecting and eventually recovering endangered species.

Four general alternatives for the future of the ESA are analyzed. Two obvious alternatives are leave the ESA as it is, or get rid of it. A third alternative is to replace the entire ESA with something else that would provide a different approach to saving imperiled plants and animals. Two such approaches are an Endangered Ecosystems Act which some suggest should complement, not replace, ESA, and something along the lines of the *Noah's Choice* alternative described by Mann and Plummer (1995c) in their book with that title. A fourth, and perhaps the most likely alternative, is to modify the Act incrementally, perhaps by adding new features and modifying existing ones. Many of them are analyzed in this chapter.

It is not the PAG's role to advocate or recommend one alternative over another. The



inclusion or exclusion of any particular alternative should not be construed as either support for or rejection of it. Preference for one alternative or another is a function of individual beliefs about different scientific theories, moral questions about the relationship of humans and other species, and political questions reflecting different positions on the relative importance of the social and economic impacts of managing and recovering threatened and endangered species.

### (1) Leave the ESA Alone

This is the "do nothing" alternative, and it leaves several questions open. Will past successes be the template for the future? Can implementation problems be resolved by learning from experience? Is there adequate flexibility in the Act to adapt to changing ideas and adopt new approaches? The replies to these questions have affirmative elements, and perhaps the ESA does not need modification. But the replies also have negative elements, and perhaps other alternatives should at least be considered to see what they offer.

Some people contend that the ESA is a failure and unworkable (see comments cited by Bean 1991, also see criticism of Lambert and Smith 1994, Mann and Plummer 1995c). As part of their assertions, some critics cite the growing list of endangered, threatened, and candidate species and the relatively few species that have had their status improved. The Act has been described as reactive, crisis-oriented, and too expensive. Other critics compare endangered species recovery to emergency room treatment. The patient is in trouble, and needs intensive special care immediately to keep the situation from worsening. Bean (1991) and Mann and Plummer (1995c) attempted to put these claims in perspective. Furthermore, if the ESA cannot recover imperiled species, that is probably because habitat protection is not strict enough and financial resources are inadequate. Perhaps more important, the ESA waits too long to act, as with Snake River sockeye salmon (J.M. Scott, review comments).

The first twenty years of implementing the ESA produced few success stories. There are good reasons why. Listed species are in

trouble, and depending on the cause of endangerment, recovering them is a difficult undertaking. Looking to the future, it seems that the most difficult species conservation problems have already been encountered. Because these problems have proven so difficult, precautions to avoid such situations in the future by positive actions to avoid the need for listing seems to be a good strategy, and avoiding the command and control regulatory approach of the ESA is an incentive to take preventative action.

Implementation problems certainly include underfunding, but one must ask, if there is strong public support for species conservation, why is it such a low budget priority? One reason may be that for most people, imperiled species are not a high priority or high profile issue, even though they support species conservation. Another reason may be that Congress views others needs as more pressing in the budgeting process. Another possible answer lies in the uncertainty of biological determinations, both in identifying species needing protection, and in setting the goals for recovery. Recovery efforts might work better if more attention focused on the factors causing endangerment, and species needs were balanced with human needs. Perhaps then more funding would be available. As it is now, the Service decides where and on what activities ESA appropriations will be spent.

The "do nothing" alternative is now widely recognized to be untenable. The question is what should be done? The choices are basically three: leave the statute as it is and modify implementation, modify the statute and trust the implementing agencies to follow congressional direction, or modify both the statute and its implementing regulations. A strong case can be made for modifying implementation (see 100 pages of arguments in Houck 1993). Whether the statute itself needs to be modified should be addressed as implementation is considered, and desirable action by the Service identified. Some such actions may require statutory change.

If the ESA statute is not changed and only the implementing regulations are, is there enough flexibility in the current ESA statute to make it more effective? The "do nothing" alternative maintains whatever flexibility the

Service has to protect imperiled species and promote their recovery. The Service has some flexibility because under the ESA, interagency consultations under section 7 and prohibitions on taking in section 9 are case-by-case inquiries. Furthermore, the Service considers a recovery plan as advisory, not compulsory, which adds flexibility even though the ESA gives the Service implementing responsibility. Lawsuits, too, are case-by-case and test whether the flexibility is being used appropriately.

Whatever flexibility the Act has is given to the Service, thus the implementing agencies probably could implement almost any change they wanted to, thus precluding the need to substantially revise the ESA. Recent moves by Secretary Babbitt to revise ESA implementation by the FWS (e.g., peer-review of all listing/delisting decisions, binding habitat conservation plans for private landowners, etc.) attest to this flexibility (*Public Lands News* 1994).

If Congress believes there is not enough flexibility in the ESA, then it has the power to modify the Act to encourage desirable implementation features. It should be noted that in March 1995 the Department of the Interior produced a "10-point plan" to modify ESA implementation, and it stresses some of the flexibility in the Act. These ten principles now guide the Clinton Administration's efforts for reforming and implementing the ESA (see Sidebar 15-1).

Current efforts of the Department of the Interior to locate and use the flexibility that is in the ESA are a recognition that implementation of the Act is not working as smoothly as it could to attain its goal of species conservation. Smith (review comments) noted there are also legitimate concerns that the costs of achieving recovery of all imperiled populations may be too high. For example, he cited the tribulations of west coast timber-dependent communities caused by protection of the northern spotted owl and other old-growth forest inhabitants. He also cited similar potential economic impacts on inland rural communities in the northwest from the protection of grizzly bears, wolves, salmon, and other species. The challenge is to see if ESA goals can be achieved with less cost

and unfairness (A. Smith, review comments).

## (2) Repeal the ESA

Although proposals to entirely dismantle the ESA exist and some interest groups promote the idea, public opinion polls summarized in Question 11 show strong support for the ESA. Given that support, the idea of repeal is difficult to take seriously. Instead, there are two general alternatives in the next two sections to modify the ESA rather than dispose of it entirely. These are replacement of the Act with something else, or incremental modification of it.

## (3) Replace the ESA

Two proposals to replace the ESA are analyzed in this section.

*"Noah's Choice" Alternative.* In a timely book, Mann and Plummer (1995c) offer a new version of the ESA. They do not specifically name it, nor do they provide specifics as to how it could be either attained or implemented politically. They claim to be politically naïve and offer ideas, not political solutions. Their idea may be called an antidote to *Noah's Choice*, the title of their book.

Noah, of course, did not make a choice. God provided him with the design and materials adequate to build an ark to house all of God's creatures. We are learning that our ark is not so commodious. We are faced with choosing which species will perish, a tragic choice. As Mann and Plummer (1995c) put it, the goal of saving biodiversity and the goals of providing housing, health care, education, and the many other goals we have institutionalized over the past 200 years make the choices difficult. No amount of scientific research or government planning will make these tough choices disappear.

The ESA goal is to save every species that is in danger of extinction. We cannot save them all (Scott et al. 1991, Tear et al. 1993). Who chooses? Mann and Plummer (1995c) provide a reply. If efforts to protect biodiversity are to improve, we must, according to Mann and Plummer (1995c) acknowledge that sometimes species become

Sidebar 15-1. Ten Principles for Federal Endangered Species Act Policy

Ten principles guide the Administration's effort for reforming and implementing the Endangered Species Act:

1. **Base ESA decisions on sound and objective science.**  
Federal Endangered Species Act policy must be based objectively on the best scientific information available.
2. **Minimize social and economic impacts.**  
The ESA must be carried out in a manner that avoids unnecessary social and economic impacts upon private property and the regulated public, and minimizes those impacts that cannot be avoided, while providing effective protection and recovery of endangered and threatened species.
3. **Provide quick, responsive answers and certainty to landowners.**  
The ESA must be carried out in an efficient, responsive and predictable manner to avoid unnecessary social and economic impacts and to reduce delay and uncertainty for tribal, state and local governments, the private sector and individual citizens.
4. **Treat landowners fairly and with consideration.**  
The ESA must be administered in a manner that assures fair and considerate treatment for those whose use of property is affected by its programs.
5. **Create incentives for landowners to conserve species.**  
Cooperation with landowners in protecting and recovering species should be encouraged through use of incentives.
6. **Make effective use of limited public and private resources by focusing on groups of species dependent on the same habitat.**  
To make effective use of limited resources, priority should be given to multi-species listings, recovery actions and conservation planning.
7. **Prevent species from becoming endangered or threatened.**  
In carrying out its law and regulations, the Federal Government should seek to prevent species from declining to the point at which they must be protected under the ESA.
8. **Promptly recover and de-list threatened and endangered species.**  
The ESA's goal of bringing species back to the point at which they no longer require the Act's protection should be achieved as expeditiously as practicable.
9. **Promote efficiency and consistency.**  
The ESA should be administered efficiently and consistently within and between the Departments of Commerce and the Interior.
10. **Provide state, tribal and local governments with opportunities to play a greater role in carrying out the ESA.**  
Building new partnerships and strengthening existing ones with state, tribal, and local governments is essential to each of the nine previous principles and to the conservation of species under the ESA in a fair, predictable, efficient and effective manner.

endangered for good reasons. As they put it, "To say otherwise is to condemn all human endeavor as trivial, an environmental reformation of the doctrine of original sin" (Mann and Plummer 1995c, p. 216). These are strong words, but a necessary preface for considering complete ESA reform. They offer four principles as the foundation for *Noah's Choice*. The system for making choices must be ethical, practicable, knowledgeable, and political. Relying on experts to determine biodiversity policy is, they say, as absurd as relying on a political referendum to determine which species should be listed. Science has its proper place, which is providing information to support policy choices. The necessity of providing adequate data to inform political choices calls for a better system and a devotion of more resources to gathering information (Mann and Plummer 1995c). The following points for ESA reform are based on the four principles of *Noah's Choice* stated above:

- Separate the endangered species list from its attendant duties, making the list an information device rather than a rigid conservation manifesto.
- Provide much of the protection with a national biodiversity trust fund, a different and flexible mechanism to encourage conservation and facilitate choices.
- Reduce the minimum duty owed to a species under the law by scaling back the definition of take to the "intentional, direct harm of an individual member of a listed species."
- Establish a two-part biodiversity advisory board, one half consisting of a panel of eminent biologists, the other half a panel of social scientists, economists, philosophers, and political scientists. The task of the board would be to establish biological priorities and weigh them with economic, moral, and social values.
- Rather than making itself subservient to a panel of ecological and economic experts, Congress, the representation of our collective national interests, would make the overall choice. (Mann and Plummer 1995c).

By failing to mention it, this design ignores the importance of habitat. Nonetheless it would allow important, but unrelated, questions to be addressed: What is the most efficient way of reducing the probability of extinction for this species? What is the effect on the productivity of this wetland ecosystem

if its area is reduced by one-third? How closely are these two species related? In deliberating such questions, a precept is confronted head-on: biodiversity has intrinsic value to people, but the goal of protecting it must be weighed against other values (Mann and Plummer 1995c).

Their ideas are captured by the following quotation:

For too long have members of Congress been free to wax rhetorical about the value of the environment while refusing to back necessary increases in the budget for protection. For too long has the Fish and Wildlife Service been saddled with the impossible task of saving everything on a tiny budget.... [I]t is necessary for those most concerned with the fate of biodiversity to make their case clear, without remorse to misleading predictions of impending doom or bogus claims about the vast potential storehouse of medications locked up in every bug and plant. They should not be opposed by their usual foes, because a bigger [National Biodiversity Trust] budget would represent greater opportunity to buy out landowners at a profit. The end may resemble something that has never existed: a countrywide debate on the value of biodiversity, and a democratic vote on the means of its protection. (Mann and Plummer 1995c).

Many details further describing the above principles and points for implementing them are laid out in *Noah's Choice*, including ideas about a national biodiversity trust fund, the centerpiece of reform suggested by this alternative. Just as important, Mann and Plummer (1995c) provide good arguments for those on the "strengthen" side of the ESA reform debate in order to support their *Noah's Choice* proposal (see pages 231-233). A reality check is provided by analyzing how protection for a widespread species (the Karner Blue butterfly) would work under their system.

Without meaning to sound like an endorsement for *Noah's Choice*, it is essential reading for those who have not already made up their mind about species conservation. Those who recognize that species conservation involves political choices as well as biological information should read this book before coming to a conclusion about the future of the ESA.

**Endangered Ecosystems Act.** Some observers have said an Endangered Ecosystems Act that takes the idea of multiple-species conservation and recovery plans to its ultimate conclusion is needed to make the ESA more effective.

If no one knows how to tell when a species is threatened or endangered, or where the line is drawn between the two; if no one can be certain which areas will or will not constitute critical habitat for a listed species; and if there is no objective method for determining when a species is no longer in need of protection, the result is a statute fraught with potential for manipulation by environmentalists and developers alike....

[T]he fogginess of the standards allows for lax and ineffective implementation of the ESA...

[D]rastic change is essential if the ESA is to be more than very expensive, very controversial window dressing on the hearse of dead species. (Kunich 1994, pp. 568, 579).

Kunich (1994) and others argue that we would not have the problems of trying to recover species that are at the brink of extinction if large land areas were protected, with biodiversity the dominant or even sole purpose. From a biological standpoint, the argument is irrefutable. From a practical standpoint, the argument translates into selecting representative parcels of land containing or consisting of ecosystems in need of preservation or special protection. Large wilderness areas already protected in Idaho may meet some of that need. A spokesperson for the citizen group Defenders of Wildlife said an Endangered Ecosystems Act would be impossible to pass, implement, and enforce (Vickerman 1992). The space and time dimensions inherent in ecosystem dynamics confront the preservation strategy head on. How can the condition of something that is characterized by change be preserved?

There are other ways to protect ecosystems besides a preservation strategy. Ecosystem protection based on disturbance dynamics recognizes that change is a natural part of ecosystems. The implication is that it is futile to attempt to preserve the state of an ecosystem, but it is essential to protect the processes that drive ecosystem changes.

Some observers believe a more proactive multi-species approach may be needed (Scott et al. 1993) and scientists are currently working

on it through both theoretical and applied programs in the Department of the Interior (for example, see Noss et al. 1995). Presumably, these efforts will result in a land-use classification program—such as a biodiversity reserve system—that conserves some well-chosen mix of habitats and ecosystems that promote some level of biological diversity protection. This approach might preclude the need to list individual candidate species and help insure the recovery of many listed species. However, the needs of some species will inevitably not be met. Because it would involve significant land-use changes, a biodiversity reserve system may not be implemented until some distant future date, if ever. Until effective, multi-species methodology can be developed, tested, and implemented, the current course of single-species programs is necessary to protect the most fragile components of biological diversity and promote their survival.

The ecosystem preservation strategy, if ecologically feasible, will require new designations of dominant-use set-asides of land for biodiversity protection. To be effective, such a biodiversity reserve system will need to be controlled by the federal government. Such centralized control of what will undoubtedly be large shifts in American land-use patterns is tantamount to a revolution in American political institutions that govern land-use decisions.

If biodiversity preservation or protection is to be our overriding national goal, then a system of biodiversity preserves or protected areas is one approach. However, we are a long way from setting such a national priority. Until that happens, our policy to protect the most fragile and most imperiled components of biodiversity remains in place. The Endangered Species Act has that noble purpose. How can it work better?

#### (4) Modify the ESA

Efforts to modify the ESA will be looked at from two vantage points. Does the proposal "strengthen" or "weaken" the Act? The more relevant question is, what would make species conservation more effective? What changes would effectively promote species recovery

and delisting?

The ESA statute is unclear how species conservation is to proceed. As a result, the real ESA policy is made by implementation through Service regulations rather than the statute itself (Brewer and Clark 1994). Successful modification of the ESA to make it work better will no doubt lie with some combination of statutory and regulatory change. That is, either Congress or the Service can affect ESA implementation. Congress can modify the ESA by amending it and has done so on several occasions. Congress can write legislation to deal with special cases of conflict between species conservation and economic development. There are only a few instances where the Act has proven to be not flexible enough and special action was taken by Congress. The most prominent example was a Tennessee Valley Authority hydroelectric project that would have destroyed habitat for the endangered snail darter. The Tellico dam was specifically authorized by Congress even though the Endangered Species Committee determined that "reasonable and prudent alternatives" existed that would not have adversely modified snail darter habitat. Dam construction was clearly an end run around the ESA. The second example promoted conservation as well as development. With special legislation, Congress resolved conflict between the southern sea otter, abalone fishermen, and off-shore oil drilling as well as conflict between the ESA and the Marine Mammal Protection Act. In the third instance, congressional attempts to legislatively resolve the conflict between conservation of the Mt. Graham red squirrel and a mountaintop observatory and telescope in Arizona were unsuccessful. Using the ESA, squirrel advocates (see Warshall 1994) were able to obtain an injunction to halt the portion of the project in critical habitat (Dougherty 1995, Jones 1995).

One of the things made clear by Service regulations is that an agency can use the flexibility in the Act to suit its own design of how the statute should be implemented. It is worth considering that bureaucracies have their own purposes, which may or may not coincide with congressional intent. Congress may

exercise its oversight authority and examine ESA implementing regulations. Congress might also consider asking the Service to seek advice before it writes regulations. For example, before the U.S. Forest Service could write implementing regulations for the National Forest Management Act, the agency was required to create a committee of scientists and then seek their advice.

Smith (review comments) said the two ESA consulting Service agencies have acted in ways which tend to constrict their duties and accountability under section 4, while sometimes contracting, but generally expanding their authority under sections 7 and 9. In some cases this may have increased flexibility, in other cases it has not. A safer generalization is that consulting agencies have not consistently interpreted the provisions of ESA over time. Perhaps this indicates the need for Congress to revisit the concepts of "jeopardy," critical habitat, and taking, among others (A. Smith, review comments).

In this section, incremental changes in the ESA are analyzed, based on the review of current issues presented in Questions 9 to 12. The purpose of the ESA is the starting point. From there, the four major mandates of the Act are analyzed, following the basic outline presented under Question 1.

**Purposes of the ESA.** The ESA statute is clear that one of the two purposes of the Act is "to provide a program for the conservation of such endangered species and threatened species" (ESA § 2(b)). The statute is not at all clear when it says one of the purposes is

to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved (ESA § 2(b)).

Although the ESA states that "ecosystem conservation" is a purpose of the Act (ESA § 2(b)), there is no process specified in the Act to actually do this. The "ecosystem conservation" statement is merely declarative, and has neither substantive nor procedural mandates to implement it. But that didn't stop Jack Ward Thomas, now Chief of the U.S. Forest Service, from erroneously informing President Clinton, Vice-President Gore, and key cabinet members during the April 2, 1993

Forest Conference in Portland, Oregon that, as Chief Thomas said,

The culmination of the National Forest Management Act and its regulations for viability of all vertebrate species is a tough law. If you don't perform under that law, you get to go to the penalty box under the Endangered Species Act. Don't forget that the first paragraph of the ESA says it's not the species that's listed, it's the ecosystem on which it depends (J.W. Thomas, videotape transcription).

Chief Thomas interpreted the ESA inaccurately, making the ESA sound as if it protects endangered ecosystems. It does not, but instead species, subspecies, and distinct population segments of species are listed and protected, not the ecosystems upon which they depend. The ESA does not say ecosystems are to be protected; they are to be conserved (ESA § 2(b), see above). However, conserve has a specific definition in the Act that is applied to species, not ecosystems. Conserve means "use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which measures provided pursuant to this chapter are no longer necessary" (ESA § 3(3)). The ESA mandates clearly have but a single purpose, the recovery of listed species. The purpose of the ESA is active conservation to delist imperiled species, not "protect the system," as Chief Thomas construed the purposes of the Act.

It would seem Congress wrote the "ecosystem conservation" purpose statement in recognition of the importance of habitat in species conservation efforts. Although the ESA does require the designation of critical habitat (ESA § 4) and its protection (ESA § 7), the goal of the ESA is to recover endangered species (Tobin 1990). Even if all species had designated critical habitat—less than 15% do—it is difficult to construe designated critical habitat as ecosystem protection. Critical habitat designation and protection focuses on the elements of habitat essential for the protected species and not all of the ecosystem functions of that habitat (Feldman and Brennan 1995). The Service protects habitat through ESA section 9 by defining "harm" as "significant habitat modification" (critical or otherwise). It is difficult to categorize habitat protection as "ecosystem conservation" or even

ecosystem protection. Habitats are features of ecosystems, not necessarily ecosystems themselves.

There is no more important species conservation issue than habitat protection. Congressional clarification of the approach to "ecosystem conservation" and how the Service is to undertake habitat protection seems to be in order, especially because the Service has written regulations that make critical habitat protection redundant. According to Smith (review comments), the Service has not only avoided designation of critical habitat, but has formally defined its protection under section 7 as confined to habitat necessary for survival, rather than recovery (50 CFR § 402.02 defines "destruction or adverse modification" as habitat alteration which is an appreciable threat to "both the survival and recovery" of a protected species, duplicating the definition for "jeopardy"). Read literally as such to require both survival and recovery, impermissible alteration of critical habitat can occur only if survival is threatened (Houck 1993). Current actual practice appears to depart from this narrow approach (A. Smith, review comments).

Smith (review comments) stated that "jeopardy" and critical habitat can be considered redundant in three senses: 1) the concept of "jeopardy" may be enlarged to include anything impeding recovery, thus encompassing the scope of critical habitat, or vice versa; 2) because habitat requirements and a species' welfare are so closely connected, and both conditions must be satisfied in order for a project to proceed through section 7 consultation, the two concepts merge as a practical matter; and 3) judgments under section 7 consultation necessarily duplicate those called for under section 4 designation of critical habitat (A. Smith, review comments). This complex explanation of critical habitat implementation is one reason why conservation biologists Murphy and Noon (1991) singled out critical habitat as an example of ambiguity in the ESA statute.

Now that federal land and resource management agencies have identified "ecosystem management" as their underlying philosophy and been working towards implementation for several years, there is an

emerging recognition that ecosystem-based management is mind-bogglingly complex. There seems to be no practical way yet identified to prescribe what this approach ought to be, or how to satisfactorily identify the boundaries of ecosystems as land management units.

**Listing.** Two issues are involved here. First is reducing the listing backlog, and second is the species/subspecies issue.

**Reducing the Listing Backlog.**—The U.S. General Accounting Office (US-GAO 1979) was highly critical of the FWS implementation of the listing process in three key areas: 1) biological and non-biological variables included in listing decisions, 2) the handling of petitions, and 3) priorities to determine which species to list first and spend scarce resources on (Tobin 1990). Actions have been taken in the past decade to remedy the situation, but listing still has its problems.

Since the ESA's enactment in 1973, the FWS routinely has not met required deadlines for reaching listing decisions. The General Accounting Office (1992) provided information on the number of listing petitions that the FWS acted on between the enactment of the ESA and September 1991, as well as the number of FWS-initiated listing actions that were subject to the one-year time frame for reaching a final decision following a proposed rule to list a species. The General Accounting Office reported that for the 105 twelve-month findings required for petitioned listings, the FWS met the deadline 33% of the time, was late by less than 6 months 45% of the time, and was late by more than 6 months 22% of the time; 18% of the time, the FWS was more than one year late. Of the 368 final rules required, 63% were issued within one year of the proposed rule (as required), 28% were late by less than 6 months, and 9% were late by more than 6 months; 4% were more than one year late (US-GAO 1993b).

The US-GAO examination of the circumstances associated with delays in reaching listing decisions disclosed that for each of the six species cases analyzed, one or more of the following five factors were present:

- questions by FWS biologists or others about

whether the available biological data were sufficient to make the listing decision;

- concerns expressed by entities outside FWS about the potential economic or other impacts of a listing;
- uncertainty among FWS officials about the procedures to follow for issuing listing rules in light of the January 28, 1992, presidential moratorium on issuing new regulations;
- FWS' limited staff resources to conduct studies or complete other activities considered relevant to the listing decision; and
- FWS' efforts to develop and finalize conservation agreements for the species as an alternative to listing the species. (US-GAO 1993b).

Delays by the FWS in reaching listing decisions were the subject of an important lawsuit. In 1992, *The Fund for Animals v. Lujan* litigation against the Department of the Interior charged the agency with unreasonable delays in listing species. In December 1992, the parties reached a court-approved settlement agreement. The agreement required the FWS to make listing determinations for a large number of identified species for which the available information is considered sufficient to support proposals for listing (US-GAO 1993b). Under terms of the settlement the FWS must increase the number of species determinations per year and complete review of approximately 400 candidate species by 1996. The listing moratorium imposed by Congress in April 1995 has intervened, but the issue will be revisited.

**The Species/Subspecies Issue.**—Does extinction apply at a global scale or does it mean local extinction (or extirpation)? Current implementation is often clearly focused on the latter meaning, with little consideration of the former. There is a way to link the two that seems to be consistent with evolutionary biology. Subspecies and distinct population segments are recognized and treated under the ESA as if they were the same as a species. They are not. They are subclassifications that contribute to diversity and evolutionary potential of the species. The ESA question is, how much does any given subspecies or distinct population segment contribute to the continued existence of the species on Earth? In the case of the northern spotted owl, which



is one of three subspecies of *strix occidentalis*, the answer is quite a lot. Probably at least one-third, if not more. In the case of Snake River sockeye or chinook salmon, the answer may be not very much, considering the number and magnitude of different sockeye and chinook runs in Canada and Alaska.

There is a mechanism in the Act to account for the global scale during the listing process:

The Secretary shall make determinations ... solely on the basis of the best scientific and commercial data available to him after conducting a review of the status of the species and after taking into account those efforts, if any, being made by any State or foreign nation,... (ESA §4(b)(1)(A)).

This second clause in this mandate has never been implemented; the Service has not written regulations for it (Lloyd 1995). Attention to this might make listing more closely aligned with preventing extinction of a full species (i.e., including all subspecies and distinct population segments in the analysis) and thus reduce the resources devoted to the protection and recovery of populations at the edge of their range, such as gray wolves, grizzly bears, sockeye salmon, and marbled murrelets. One other item would need to be considered, however.

The Act could be modified to ensure that when biological information on listing is assembled, it includes all related subspecies and distinct populations, and their relative contribution to the overall potential to perpetuate the entire species. This seems consistent with metapopulation theory, but it might make conservation of grizzly bears and gray wolves in the lower 48 states a rather low priority for species conservation, given the abundant populations in Canada and Alaska. Such a change might be considered heresy by those who favor such species in the lower 48 states.

Species conservation in some cases is not about protecting a species from global extinction, but is instead concerned with preventing the extirpation (or local extinction) of small populations. In Idaho, for example, 8 of the 18 listed species are local populations of species that are abundant elsewhere (Table 15-1). This is clearly what Congress intended. The National Research Council (NRC 1995)

report affirms the need to protect subspecies, but purposely ignored non-biological impacts of such reasoning except to say they were important policy considerations.

Clearly Congress did intend to protect small populations at the periphery of large ranges. Nonetheless some priorities may be desirable. If biologists took a metapopulation approach and identified the condition and potential risk faced by all populations within the full species, some rational decisions about recovery priority could be made based on threats to global extinction, rather than the popularity of certain organisms with the public or with biologists themselves.

Consistent with the recommendation by the National Research Council (1995), this approach would need careful peer review by those knowledgeable about the species and evolutionary biology.

**Peer Review.** Because the viability of a species, or a population of a species, is a future-oriented concern, it is fraught with uncertainty. In the face of uncertainty, biologists are likely to be conservative with their estimates of viability. This can be illustrated by estimates of the minimum viable population size for grizzly bears that range anywhere from 50 to almost 4,000 individuals (MacCracken et al. 1994). According to Scott (review comments) 50 is not biologically defensible. Uncertainty prevails, and landowners and land users are perplexed.

In the face of uncertainty and disagreement among scientists, it almost goes without saying that some method of peer review is necessary to ensure that the best scientific models and data are being applied. Yet until recently, there was no statutory or regulatory provision for peer review of biological information in the ESA listing or recovery process. On July 1, 1994 the Service adopted, through regulation, a policy statement "to incorporate independent peer review in listing and recovery activities, during the public comment period" (59 *Fed. Reg.* 34270 [July 1, 1994]). A separate directive established standards for the kind of scientific information to be used in making ESA decisions.

The essence of the scientific peer review process is to involve other scientists who can evaluate and correct the course of research

Table 15-1. Threatened and endangered species in Idaho, \* indicating local populations abundant elsewhere(†).

<u>Endangered</u>
Whooping crane
American peregrine falcon
* Gray wolf
* Woodland caribou
* Kootenai River white sturgeon
* Snake River sockeye salmon
Banbury Springs limpet
Utah valvata snail
Idaho spring snail
Snake River physa snail
MacFarlane's four-o'clock
<u>Threatened</u>
* Bald eagle
* Grizzly bear
* Snake River chinook salmon, fall run
* Snake River chinook salmon, spring/summer run
Bliss Rapids snail
Water howellia

† Abundant means populations of the full species exist elsewhere that are not protected by the ESA.

based on current knowledge. Research priorities are set during the peer review process. If policy makers are serious about protecting biodiversity and concerned about a sustainable future, some form of peer review should be instituted so environmental policy and science can work toward that common purpose (Redford and Sanderson 1992).

A National Research Council committee was asked by members of Congress to review a number of scientific issues related to the overall purposes of the ESA. In the executive summary of its findings (NRC 1995), the committee did not specifically emphasize the importance of peer review in scientific

decisions. It did, however, recommend that competent systematists will often be required to delineate species and subspecies. In recovery planning, the "FWS should convene a working group to develop explicit guidelines for the application of data to the construction of recovery objectives and criteria." (NRC 1995, p. 6). Both of these recommendations sound like peer review.

This recommendation plus the 1994 regulations for peer review and information standards would seem to make peer review almost a non-issue for new listings and new recovery plans. The only questions are who should do peer review and when?

**Critical Habitat Designation.** The report of the National Research Council committee on *Science and the Endangered Species Act* (NRC 1995) addressed the importance of habitat:

Habitat, the spatial dimension of species, is absolutely crucial to species survival. The authors of the ESA recognized that species conservation must include strong provisions for habitat conservation ... through the designation of critical habitat and through the elaboration and implementation of recovery plans. (Clegg 1995, p. vii).

One of the most controversial aspects of the ESA is the designation of critical habitat, habitat that is essential for conservation. In other words, habitat necessary to recover the species and delist it. Congressional use of the term "essential" in defining critical habitat is both enabling as well as limiting. Consulting agencies are to designate whatever territory is necessary to a species recovery, but are also directed to keep critical habitat to the minimum necessary (A. Smith, review comments). Consider the facts: 80 of the 105 species for which critical habitat had been designated as of May 1993 had some portion of it on non-federal lands; more than half of these (43 species) had more than 80% of their critical habitat on non-federal lands (US-GAO 1994). Allowing biologists to prescribe activities on private lands is unpopular and may be a "taking" of property rights (A. Smith, review comments).

There are several possible ways to implement habitat protection as Congress intended, but as long as Service regulations

equate a section 9 take to "significant habitat modification" through the "harm" regulation—and section 7 "jeopardy" to "harm"—then critical habitat is indeed redundant. What is lost, however, by foregoing critical habitat is congressional intent to include consideration of economic and other impacts in habitat protection. Public accountability is also lost by this approach (A. Smith, review comments). "Other impacts" have never been defined (Lloyd 1995), but that is also a moot point as long as the Service considers critical habitat as redundant protection.

Congress perhaps should clarify how the Service should protect habitat on federal and non-federal lands. Two conservation biologists (Murphy and Noon 1991) recognize the need to "exorcise ambiguity" from the ESA, and suggest a good starting place is critical habitat. Serious attention to critical habitat designation would introduce certainty into the Act. It is clear that this is the habitat protection Congress intended.

The attempt by Congress in 1978 to interject economic and other impacts into the listing process through the critical habitat concept has failed. Congress itself in 1982 separated listing as a strictly biological determination from critical habitat designation. Perhaps the economic impact requirement associated with critical habitat should be jettisoned or put somewhere else—if not with listing and critical habitat designation, then where? Recovery planning is the obvious choice.

In its report on the ESA, the National Research Council made some recommendations that recognize the importance of habitat protection:

... some core amount of essential habitat should be designated for protection at the time of listing a species as endangered as an emergency, stop-gap measure... without reference to economic impact. Economic review may need to remain linked to critical habitat determination... of areas essential to the recovery of species.

Hence we suggest designation of survival habitat... at the time of listing... [and it] would automatically expire with the adoption of a recovery plan and the formal designation of critical habitat ... (including economic evaluation) to include areas necessary for species

recovery. (NRC 1995, pp. 5-6).

**Protection.** No one seems to have raised objections to the protection given to listed species and their parts from commerce and trade. Nor does anyone seem to have major objections to prohibiting the outright killing or other direct "harm" caused to individual members of protected species. The protection of habitat, however, is controversial and the target of various reform proposals.

**Clarify the Definition of Take.**—Is "significant habitat modification" a section 9 take of a species? In June 1995 the United States Supreme Court in *Babbitt v. Sweet Home Chapter* affirmed the FWS regulation that is was.

The recent decree of Secretary Babbitt (Lehman 1995) to exempt private landowners from the taking prohibition if they have less than five acres is some accommodation, showing the Service is willing to bend. But clarification is still needed.

**Offer Incentives.**—Species conservation is a public good, and it may be unfair to force some landowners to bear the cost of obtaining this good by foregoing certain activities on their property. There are issues of constitutionality here involving regulatory "taking" of property rights. Beyond that, there is something to be said for offering a carrot, through financial incentives, to achieve conservation goals rather than relying entirely on the stick of federal regulations (A. Smith, review comments).

**Acquire Land.**—According to Lambert and Smith (1994), the 1966 species protection legislation, which authorized the purchase, but not the regulatory "taking," of land for species conservation, did not violate the "takings" clause in the Fifth Amendment to the United States Constitution. The power of eminent domain provides a just mechanism by which the government can secure public goods (Lambert and Smith 1994). Funds are available through the Land and Water Conservation Fund Act of 1965 for the purpose of acquiring habitat for protected species (ESA § 5).

**Streamline "Incidental Take."**—There are provisions in the ESA that authorize "incidental take" statements through the section

7 consultation process for federal projects. State and private landowners can obtain an "incidental take" permit subsequent to the preparation and approval of a Habitat Conservation Plan. Both these processes could be streamlined. However, draft regulations circulated by the FWS in late 1994 seem to go the opposite direction. These call for states and private landowners to prepare NEPA documents in order to obtain an "incidental take" permit. This may be unfair because the Service doesn't require NEPA documents for its own recovery plans.

**"Take" Flexibility.**—Section 4(d) provides "special rules" for take of threatened species. The FWS, however, generally prefers treating threatened species as if they were endangered. Section 10(j) allows certain reintroduced populations to be considered "experimental non-essential." The reintroduction of the gray wolf and the proposed reintroduction of the grizzly bear in Idaho through translocation have used this. "No take" agreements as described in Chapter 12 can also be used by the Service. Wider use of all these provisions already in the Act and streamlining of procedures would reduce some of the uncertainty in protection actions.

**"Jeopardy" Consultation.**—It would be difficult to come up with a more flexible definition of what constitutes "jeopardy" to a species than the Service's definition. This gives the Service discretion to tell other federal agencies whether or not their proposed projects or permits will reduce the likelihood of species survival or adversely modify critical habitat essential for recovery. This is as it should be. But the processes for doing so are cumbersome.

Daugherty (1993) said that although section 7 consultation has not directly blocked many federal projects or activities, it has put the Service in a position of direct involvement with the day-to-day operations of other federal agencies. This monitoring and oversight activity has achieved some "piecemeal" protection of species, but has also produced uncertainty, delay, and frustration among federal agencies and others dependent on their actions. It also results in seemingly endless legal challenges to agency actions. In this context, the consultation process may be

"broken." Statutory revision might introduce greater certainty and provide less intrusive oversight for federal action agencies and private industries alike, as well as greater species protection. Then again, statutory changes may not be necessary. More reliance on the exemption process, cumbersome as it is, may be helpful. Further improvements through increased public participation in consultations and increased reliance on programmatic, rather than project-specific, consultations may also streamline the process. Rapid and efficient adoption of these suggestions with minimal legal challenges would require congressional action (Daugherty 1993).

Citing consultation as a major area of stress, Rollie Schmitt, the director of the NMFS, said he favors including other parties, such as private companies, Indian tribes, and state agencies, in the federal review of whether actions would affect listed species. He said, "The Act favors the federal government" (Wickline 1995a).

When there is a connection between federal agencies and non-federal activities, consultation can also cause uncertainty, delay, and frustration. Access across U.S. Forest Service roads to state and private timberlands in Idaho has caused such problems, as documented in the salmon case study for an Idaho Department of Lands access permit for a timber sale. Based on their experience with consultation, Winston Wiggins, Assistant Director of the agency, offered the following suggestions to improve ESA implementation:

- More timely response to inquiries and requests for consultation - accomplishing this probably means more people, or eliminating some tasks.
- More field people - We've found that if we can get FWS on-the-ground, we can often work things out. Unfortunately they appear to be staffed primarily by research specialists and "desk-jockeys" who never see the field. The result often seems to be a nonresponsive black hole.
- More commitment to sound science - we found in one case FWS was basing their recommendations on the unpublished work of a masters degree candidate.
- Clear species objectives - how can we know when we've succeeded. At present the goals are nebulous and shifting, and therefore success is

ever elusive. (W. Wiggins, review comments).

Smith (review comments) offered a modest proposal for reform. He said the salmon habitat litigation illustrates the harsh side effects of applying consultation procedures to ongoing plans and programs. The central legal issue in the *Pacific Rivers* cases (see **Appendix B**) was whether the U.S. Forest Service (USFS) was required to re-consult on existing forest plans in light of the subsequent listing of chinook salmon. The impact of the decision on forest users, however, stems from the second-order decision to enjoin ongoing projects which were preliminarily determined to have the potential to affect salmon ("may affect") pending completion of this programmatic review. Even though subsequent review by the USFS or NMFS determined ongoing projects would not have harmful effects (those that were thought to have adverse potential were halted by USFS), the circuit court, presumably out of concern that some sort of programmatic decision might be foreclosed if projects went forward, insisted that virtually all commodity use be halted (A. Smith, review comments).

This sort of relief, continued Smith (review comments) is overbroad. Where projects individually are unlikely to have adverse impacts, federal courts ought to insist on some showing that programmatic decisions are implicated, or tailor their remedies in a more discriminating fashion to exempt harmless activities. The result in this case occurred in part because of the scope of ESA consultation regulations. Even though ESA section 7(c) appears to contemplate consultation only where an action agency determines an action is likely to affect protected species, consulting agency regulations require formal consultation on any action which might affect a protected species, unless consulting agencies concur in a later agency decision that a particular action is unlikely to affect protected species adversely. The consulting regulation is precautionary, designed to assure that decisions not to consult on any action which potentially may affect protected species are endorsed by consulting agencies. When the chinook was listed, the USFS reviewed thousands of projects for potential impacts. All which were

preliminarily determined to have some potential impacts were included within the courts injunction, even though subsequent decisions by USFS or NMFS decided they would not have adverse impacts in fact (A. Smith, review comments).

Smith (review comments) continued: One way to remedy the harsh and overbroad impacts of these sort of cases in the future would be to make clear in section 7(c) that the initial determination of potential affects of actions is to be made by the action agency, and only those which are determined to be likely to adversely affect are to be submitted for consultation.

Another approach would be to deal directly with the issue of project and program review as Smith (1995b) suggested when he proposed the following amendment to section 7 consultation:

1. No project in compliance with consultation requirements shall be held invalid or enjoined by any court because the plan or program of which it is a part is also subject to consultation.
2. No project determined by an agency to be unlikely to affect a listed species or not to involve irreversible/irretrievable commitments of resources shall be held invalid nor enjoined by any court unless that determination is found to be an abuse of discretion. (Smith 1995b).

As Daugherty (1993) concluded, the cases of spotted owls and salmon illustrate that the section 7 consultation process has failed to resolve species conservation conflicts in an ecologically, economically, or politically sound manner. Failure suggests section 7 of the ESA needs revision, but it may be that the statutory framework is adequate. Congressional prodding, however, may be useful to move to the Service in the right direction (Daugherty 1993). Thomas and Verner (1992) asserted that economic and social factors are regularly taken into account at every step of the ESA process. Smith (review comments) said he had not found social and economic considerations to play an important role in recent consulting agency decisions. He suspected that there was considerable pressure on consulting agencies to temper biological judgements throughout President Reagan's administrations and that this has changed considerably with President Clinton's administration. But surely the

presence of shifting of political climates does not equate with regular accounting of non-biological factors. However, if these commentators are accurate, it suggests that the law should be amended so that weighting of these factors is accomplished in a visible public manner (A. Smith, review comments).

**Recovery.** The key to or blueprint for ESA success is the recovery plan (see Sidebar 15-2). It must provide quantitative, identifiable goals indicating when the protected species has recovered to the point it can be delisted. The recovery plan should identify how the factors causing endangerment as identified in the listing process will be mitigated. The Service is required to enumerate expenditures for implementation actions.

According to Tobin's (1990) analysis, Congress mandated the recovery of all listed species, but the FWS decided to pursue a different goal. The agency did not reject Congress' goal, but believed it would be more desirable to concentrate its limited resources on the species at the edge of extinction rather than on those closest to recovery. This maximizes the number of species saved over the long term, but minimizes the number recovered in the short term. As Tobin (1990, p. 264) put it, "The FWS approach is ecologically defensible, but not politically astute."

**Bad Biology?**—Critics of recovery planning say goals are unrealistically low, as if the biological analysis were bad. In a review of all ESA recovery plans completed through 1991, Tear et al. (1993) found that of the 54 recovery plans containing population size data, 15 (28%) had recovery goals set at or below existing population size at the time of listing. Three of the species in this situation were listed as threatened, that is, not immediately in danger of extinction; however, the other 12 were in immediate danger of extinction at the time of listing and are, under the recovery goals set, being "managed for extinction" (Tear et al. 1993, p. 976). When these scientists looked at metapopulation dynamics and the number of distinct populations to be achieved, they found even less ambitious goals. Sixty out of 163 species (37%) had recovery goals for numbers of populations set

at or below the existing number of populations at the time of listing. Using criteria developed by Mace and Lande (1991) for estimating the risk of extinction for vertebrates, they found that 18 of 30 (60%) plans that could be evaluated using these criteria had recovery goals that left the species with a 20% probability that the species would become extinct within 20 years. Again, they felt these populations were being "managed for extinction" (Tear et al. 1993, p. 976).

Tear et al. (1993) also looked at whether the ESA overprotected subspecies and populations by comparing the ratio of subspecies to full species of North American mammals and birds to the ratio of subspecies to full species listed under the ESA. For mammals they found an overall ratio of 6.9:1 with a protected ratio of 1.28:1; for birds the overall ratio was 4.9:1 and the protected ratio of 0.49:1. While this indicates that subspecies, which are the likely to be first endangered, are underprotected, the researchers agree that inclusion of populations and subspecies could overwhelm the ESA process.

Tear et al. (1993, p. 977) concluded that in order for the ESA to be effective, planners need to be "more realistic in setting biologically defensible goals." They said the Service should establish guidelines in terms of population size, number, and probabilities of existence over specific periods of time. They also concluded that the ESA goal of recovery of species is not being met, largely because recovery efforts begin too late in the extinction process. Because the current ESA approach may be characterized as too little, too late, (J.M. Scott, review comments) they proposed an aggressive effort to save species while they are still common parts of their ecosystems, because our ability to save all endangered species is limited (Scott et al. 1987, 1993; Tear et al. 1993).

Does any of this mean the biology behind recovery plan goals is bad? Given the rarity of many of the endangered species and the difficulty of gathering adequate sample sizes, there are perhaps other more readily acceptable explanations than that biologists don't know what they are doing. Some biologists may be more realistic about short-

## Sidebar 15-2

## Recovery Planning: An Introduction

**What is it and why?**

The Endangered Species Act (Act) calls for the conservation of endangered and threatened species and the ecosystems upon which they depend, and to ultimately recover listed species to where protection under the Act is no longer necessary. Recovery planning as authorized in Section 4(f) of the Act calls for the development and implementation of recovery plans for species of animals and plants that are listed as endangered or threatened. Recovery is the cornerstone and ultimate purpose of the endangered species program. It is the process by which the decline of an endangered or threatened species is arrested or reversed, and threats to its survival are neutralized, so that its long-term survival in nature can be ensured. The goal of this process is to restore listed species to a point where they are secure, self-securing components of their ecosystem leading to eventual delisting.

**What it does and how it works.**

Recovery planning provides several benefits when completed in a timely and thorough manner. By developing recovery plans with broad public involvement, many of those most affected by recovery actions will gain a better understanding of what it will take to fully recovery a species. This can reduce and often times eliminate foreseeable human use conflicts with listed species and their habitats. To the maximum extent possible, a recovery plan must identify management tasks, recommend research needs, and list other actions that may be necessary to achieve the plan's goal for the conservation and survival of the species. The plans must develop precise, measurable criteria to objectively determine when recovery has been achieved.

The first step in the recovery process is the collection of necessary biological information, the development of species-specific recovery goals, and the formulation of management recommendations that will lead to recovery. This information establishes the basis of a recovery plan, which serves as a blueprint for private, Federal, and State cooperation in the development and implementation of recovery actions.

The second step in the recovery of a species is the implementation of recovery actions. Coordination among Federal, State, and local agencies, academic researchers, conservation organizations, private individuals, and major land users is perhaps the key ingredient for implementation of an effective recovery program. The tools of recovery are numerous, and their utility varies from species to species. Tools may include reintroductions of species into formerly occupied habitat, land acquisition, captive propagation, habitat protection, research, and public and landowner education. In its role as coordinator of the recovery process, the United States Fish and Wildlife Service emphasizes cooperation and teamwork among all involved parties to achieve the common goal of species' recovery.

**For further information:** You can contact the Service by writing: U.S. Fish & Wildlife Service, Idaho State Office - Ecological Services, 4696 Overland Road, Room 576, Boise, Idaho 83705, or calling (208) 334-1931 during regular business hours.

Source: US-FWS, undated.

term goals than other scientists would like them to be, or they may have traded off biological needs for political purposes. If the former situation fits, so be it. There is room in the scientific process for disagreement. If

the latter situation fits, it should be fixed. Improved recovery planning is the way to resolve either situation.

Peer review may be useful as a way to resolve population target goals in recovery

plans. The need for peer review of these targets is perhaps less important than the development of interdisciplinary, intergovernmental, interagency recovery planning teams.

**Two Views of Recovery Planning.**—A failure by planners to consider the factors causing endangerment, which in most cases would include habitat improvement, is a much simpler explanation for what Tear et al. (1993) termed biologically indefensible recovery goals than is bad biology. Without adequate habitat, species cannot be considered recovered, regardless of the target population goal. Effective recovery planning needs to focus on critical habitat as well as the application of conservation biology theories of viable population.

There are two views of recovery planning. One view is that recovery is essentially a land-use problem (Yaffee 1991). Conservation biologists, including Tear et al. (1993), argue that species recovery is essentially a biological problem. Recovery goals are biological, but how one achieves those is a mix of politics and biology (J.M. Scott, review comments). Listing involves not only rule-making to add species to the protected list, but also identification of factors causing endangerment. Recovery involves not only setting population goals for delisting the species, but also mitigating the factors causing endangerment. Once those factors have been mitigated and a reasonable number of individuals exists, the species should be considered recovered and delisting should proceed.

Botkin (1990) said that the condition of habitat is more important than population numbers. A small population sustained on good habitat is better than a large population in a poor habitat. Species conservation is therefore dependent on the idea of an ecosystem rather than analyses of populations (Botkin 1990).

Reporting on a conference held in October 1993 in Spokane, Titone (1993c) said that in an apparent attempt to keep Congress from rewriting the ESA, federal wildlife officials are trying to make enforcement of the ESA more acceptable to critics. According to Mike Spear, then the assistant director for ecological services in the FWS, one way to do that is

speed up the writing of recovery plans, and to use non-scientists to help write the plans, including people who might be affected by them. In the past, Spear said, people have been left with too much uncertainty as to how the ESA affects them when a species is listed. He said, "We'll be putting a lot more money into recovery planning. People will be able to say, 'I may not like it, but I know what I have to do' or 'I'm not affected'" (Titone 1993c).

On June 14, 1994 Secretary of the Interior Bruce Babbitt and Under Secretary of Commerce D. James Baker announced a series of new policies to improve the effectiveness of the ESA in recovering species, while making it easier for people to work with and understand the Act (US-FWS 1994e). One of those new policies is designed to minimize social and economic effects from recovery planning and expands the composition of recovery teams beyond the scientific community to other areas of expertise, including representatives of local interests.

As the NMFS recovery plan for Snake River Salmon takes shape in late 1995, Idahoans will be awaiting their appointment to the recovery team, which so far has only included scientists.

Some may criticize this new approach to recovery teams as allowing politics to dictate species recovery. However, in a democratic society, political processes, not biological laboratories, are where land-use decisions are formulated. Biology may be the heart of recovery planning, but social, economic, and political considerations are its soul.

**Merging the Two Views.**—There is a simple way during recovery planning to balance ecological concerns about land use with economic development considerations. Do the two analyses separately, and then merge them to ultimately determine how to provide acceptable levels of species protection along with economic development "tempered by adequate concern and conservation" (ESA § 2(a)(1)). Table 15-2 outlines proposed steps to attaining an interdisciplinary recovery plan.

Biologists begin the process. They could make their best estimates of how many distinct population segments and subspecies there are in the full species, and identify what each contributes to the evolutionary potential of the



Table 15-2. Interdisciplinary approach to species recovery.

Biologists\*

- (1) What is the current geographic range of the entire species, including all distinct population segments and subspecies? This provides, in essence, a map of genetic diversity for the entire species.
- (2) Which subspecies and populations are "evolutionary units" (as defined by the National Research Council committee [1995])?
- (3) Identify "evolutionary units" (subspecies or distinct population segments) that are threatened or endangered with the peril of extinction.
- (4) Identify "survival habitat" necessary to protect the welfare of the threatened or endangered evolutionary unit while a recovery plan is being prepared.
- (5) Identify the factors causing endangerment of those segments of the full species identified in (3).
- (6) Using the National Research Council committee's (1995) concept of risk assessment, determine the viable population levels for all distinct population segments, at several different persistence levels. For example, 90% persistence for 100 years, 80% persistence for 50 years, etc. Persistence levels should be determined by a panel of scientists.
- (7) If habitat impoverishment is one of the factors causing endangerment, identify portions of the current range essential for the recovery of the threatened or endangered evolutionary unit(s).
- (8) Based on the critical habitats identified in (7), identify those essential features of the habitat required by the species. For example, what are the structural forest characteristics spotted owls require? As another example, salmonid fish do not require undisturbed riparian areas, they need relatively clean gravel in spawning and rearing areas, proper stream temperature, sources of food, and adequate pools and other instream features.
- (9) In consultation with resource management specialists, identify habitat management alternatives that would maintain the features of critical habitat essential for conservation of that particular "evolutionary unit."
- (10) Identify specific actions that would be prohibited as causing a take by significantly modifying critical habitat.

Economists and Social Scientists

- (11) Identify the financial expenditures and social costs involved in providing those features of critical habitat under various alternatives as prescribed by biologists.
- (12) Develop cost efficiency analysis of the various alternatives in relation to risk of extinction or other persistence measures (see Figure 13-1 for a hypothetical salmon example).

Interdisciplinary

- (13) Prepare a recovery plan draft for public comment, clearly identifying a range of alternative actions and their associated levels of risk, expenditures, and other costs.
- (14) Modify the draft and prepare a final recovery plan, indicating the preferred alternative.

\* Items (1) to (5) made available for public comment during the listing process; the remainder to be accomplished during the preparation of a recovery plan.

full species. For example, a statement like the northern spotted owl subspecies contributes 50%, the California spotted owl contributes 15%, and the Mexican spotted owl contributes 35% to the survival potential of the full spotted owl species, would seem to be fundamental information if the concern is that the full spotted owl species should be protected so it does not go extinct. It will require much more scientific expertise than the Service agencies have to make these determinations, thus requiring cooperative research efforts with other agencies and institutions.

The National Research Council committee on the ESA had two related ideas that could be incorporated here (see Table 15-2). One is the idea of an "evolutionary unit." The other is risk assessment:

To permit a rational evaluation of survival and recovery goals, estimates should be provided of probabilities of achieving various goals over various periods. The periods should be expressed both in years and in generation times of the organism of concern. Evaluation of long-term and irreversible impacts should be conducted in terms of long-term recovery of the species. Although it will often be difficult to make these estimates, even the attempt to make them will have value by requiring an objective analysis and by requiring assumptions to be specified. (NRC 1995, p. 7).

Next, biologists could identify the factors endangering each distinct population segment or subspecies as well as the entire species. Then estimates could be made of how the biological needs of the species relate to the factors causing endangerment. For example, the northern spotted owl needs some of the structural characteristics of late-successional Douglas-fir forests. Biologists could identify those habitat features and characteristics and then identify how much habitat is necessary to attain the recovery goal, or viability level, for that particular population segment or subspecies and relate it to the entire species.

Then biologists could identify where critical habitat is. It should be emphasized that Congress intended that critical habitat be drawn as small as possible, consistent with recovery objectives (ESA § 3(5)(c)) (A. Smith, review comments). Thus it is habitat that is less than or equal to the current range, but

only those portions of it essential for recovering the species and requiring special management. Biologists could identify what that special management is, and a variety of alternatives for doing it if they consult with land and resource management specialists.

The biologists' work is then essentially completed, but they will be key players in answering questions about habitat management alternatives posed by resource managers, economists, social scientists, and the public, all of whom need to be included in recovery plan development and implementation.

Improved recovery planning must stem from improved biological analysis. Tear et al. (1995) and Scott et al. (1995) offered many useful suggestions for doing that, and came to the conclusion that biological analysis should be isolated from social, economic, and political considerations. However, they also recognized the importance of mitigating the causes of endangerment, and that these are often related to human activity, necessitating consideration of social, economic, and political considerations. Scott et al. (1995) suggested that these non-biological considerations be explicitly identified in recovery plans in order to determine which factors contribute to species decline and recovery.

Tear et al. (1995) further recognized that public involvement is a possible key to successful recovery planning. Souder (1993) suggested that recovery plans be more NEPA-like, which would require public participation in their development, as well as an interdisciplinary approach. It should be remembered, though, that NEPA invites process-oriented litigation, and the ESA already offers a multitude of such opportunities.

The National Research Council committee on the ESA (NRC 1995) focused some of its attention to recovery, and began by stating that the ultimate goals of the ESA is to recover threatened and endangered species. One of the committee's criticisms of ESA implementation was that recovery plan delays produced uncertainty, thus increasing disruption of human activities. The committee suggested risk assessments, a habitat-based approach to recovery, guidelines identifying activities consistent with recovery objectives, and

criteria developed by recovery working groups (NRC 1995).

**ESA and the National Environmental Policy Act (NEPA).** In general, as implementation of the ESA has evolved, the National Environmental Policy Act (NEPA) process and the ESA process have been combined. When an agency begins NEPA's Environmental Assessment/Environmental Impact Statement (EA/EIS) procedures, it simultaneously initiates the ESA consultation through the preparation of a biological assessment or biological evaluation, and determines whether any listed species present in the area are likely to be affected by the proposed action.

The relationship between the ESA and NEPA varies with the decision the agency is making. For the purposes of this analysis, agency decision-making under the ESA can be divided into five categories: the listing/delisting decision, the decision to designate critical habitat, the decision to authorize, fund, or carry out an activity, Habitat Conservation Plans, reintroductions of species, and recovery plans.

**1. Listing/Delisting.**—The FWS is not required to prepare a NEPA document—either an EA or EIS—when it decides to list or delist a species. In *Pacific Legal Foundation v. Andrus* (657 F.2d 829 [6th Cir. 1981]) the court held that the Secretary (and thus the FWS) was not required to prepare NEPA documents on a decision to list seven species of freshwater mollusks. The court held that the ESA precluded the Secretary from considering the environmental impacts of the decision. The ESA allows the Secretary to determine only whether the species is endangered or threatened—that is, whether it "is in danger of extinction" or "likely to become [so]" (ESA §§ 3(6), (20)). Because the Secretary is prohibited by the ESA from considering the environmental impacts of the listing decision, NEPA is inapplicable to that decision.

This conclusion has been buttressed by the subsequent amendment of the ESA to specify that the listing decisions be based "solely upon the best scientific and commercial data available" (ESA § 4(b)(1)(A), emphasis added). Because Congress has stated that the

listing decision is to be a biological decision, the environmental impacts of the decision *cannot* be considered. The rules covering listing decisions also apply to delisting decisions.

**2. Critical Habitat.**—The decision to designate critical habitat is similar to a decision to list a species because the designation, or any revision, is to be made on the basis of the best scientific data available (ESA § 4(b)(2)). It differs from the listing decision because the Secretary is required to consider the economic impact and any other relevant impact of designating critical habitat. The Secretary may exclude any area from critical habitat if he determines that the benefits of exclusion outweigh the benefits of specifying the area as critical habitat, unless he determines that the failure to designate the area as critical habitat will result in the extinction of the species (ESA § 4(b)(2)).

The critical habitat decision thus involves agency responsibilities that are lacking in the listing decision. None the less, the Ninth Circuit Court of Appeals has held that the detailed procedures required for designating critical habitat was a sufficient substitute for NEPA procedures. In *Douglas County v. Babbitt* (48 F.3d 1495 [9th Cir. 1995]) the court reviewed the designation process and concluded that "the procedure Congress chose...makes the NEPA procedure seem superfluous."

**3. Activity Decisions.**—While an agency decision to authorize, fund, or carry out an activity is not per se a decision under the ESA, such decisions raise ESA issues because they require a determination of whether the decision will "jeopardize" the continued existence of a listed species or adversely effect its critical habitat. In addition, agency decisions to undertake a project will also require the agency to comply with NEPA, either by preparing an EA or by completing an EIS.

**4. Habitat Conservation Plans.**—Why are state and private landowners required by the FWS to do NEPA analysis (see US-FWS 1994c) to obtain an "incidental take" permit (ESA § 10) and federal agencies are not required to do NEPA analysis to obtain an "incidental take" statement (ESA § 7)? By requiring state and private entities to do NEPA

analysis, the FWS is expanding the scope of NEPA to actions on non-federal lands. Feldman (review comments) said that federal projects or actions are already subject to NEPA.

**5. Reintroductions.**—There is another aspect of species recovery plans that has been subject to the NEPA process. This involves the reintroduction of experimental populations (ESA § 10(j)) to areas that once supported the species and appear capable of supporting the species, but currently lack the listed species. Because species reintroductions are major federal actions that are authorized, funded, and carried out by the FWS, the agency is required to comply with NEPA. Due to a high degree of public controversy, Congress directed the FWS to prepare an EIS on wolf reintroduction in Yellowstone National Park and central Idaho. The Bitterroot chapter for the grizzly bear recovery plan recommends that grizzly bears be reintroduced to that ecosystem under the section 10(j) experimental non-essential status. As with wolf recovery in Idaho, the FWS is also planning to prepare an EIS for the Bitterroot grizzly bear reintroduction program (US-FWS 1993a).

**6. Recovery Plans.**—An area of controversy with recovery plans is their relationship to NEPA and the development of an EIS. Nearly 15% of the 2,113 public comments on the 1992 draft grizzly bear recovery plan revision stated that the plan should be subject to the NEPA process.

Some observers have suggested that a recovery plan ought to be similar in structure to an EIS required by NEPA (Souder 1993). The Service's position is that recovery plans are merely advisory, and it is therefore acceptable under the ESA that biologists, rather than interdisciplinary teams required by NEPA for "major" federal actions, be responsible for the preparation of such plans. This is viewed as acceptable because the recovery plan is subject to "public review and comment on such plan ... prior to approval of the plan" (ESA § 4(f)(4)) and "each Federal agency shall, prior to implementation ..., consider all information presented during the public comment period" (ESA § 4(f)(5)). This is NEPA-like with respect to public participation, and also because public comment

need only be considered, rather than acted upon.

There does seem to be a discrepancy in the ESA, in that one section says "the Secretary shall develop and implement plans" (ESA § 4(f)(1)), which would seem to obligate the Secretary to follow the plan and prepare NEPA documentation.

Because the law says the Secretary shall implement recovery plans, perhaps the process ought to become more NEPA-like. Indeed, some observers argue that recovery plans are more than advisory, and in the case of grizzly bear recovery have filed suit challenging the agency position and requesting specific standards and guidelines for grizzly bears to be implemented as part of the plan. Others are concerned that biologists are making decisions that affect land-use activities. These tensions could be reduced by interdisciplinary recovery planning, a major feature of NEPA. However, as Feldman (review comments) noted, in the end NEPA is driven by process, not results.

The FWS stated that the grizzly bear recovery plan was exempt from NEPA because it is not a decision document that allocates resources on public lands, but is instead solely a biological document (US-FWS 1993a). Implementation of the plan will be through the adoption of its recommendations in the context of action decisions made primarily by other federal agencies, specifically the U.S. Forest Service and National Park Service (US-FWS 1993a). When the grizzly bear recovery plan recommendations are adopted by other federal agencies, they will then come under the NEPA process and appropriate NEPA documents will be prepared. Thus, in the case of the grizzly bear, the recovery plan is a recommended strategy to be applied to actions taken primarily by other federal agencies. This is consistent with Jacobsen's (1980, p. 7) assertion: "The Fish and Wildlife Service does not have the authority to tell another agency what it can or cannot do.... The FWS provides biological advice and opinions ..., but the final decision and authority rests with the federal agency." However, other agencies are unlikely to challenge a "jeopardy" opinion by the FWS because of interagency consultation requirements under section 7 of the ESA.

The FWS interpretation of the relationship between recovery plans and NEPA is untested but appears to be legally sound. Section 102(2) of NEPA requires that "all agencies of the Federal Government shall include in ... major Federal actions significantly affecting the quality of the human environment," a statement of the environmental impacts. The recovery plan is not a major federal action as that term has been interpreted because no action is being proposed. The plan merely establishes recovery goals and suggests or recommends management strategies. For example, in the grizzly bear case, the fact that the recovery plan may affect subsequently proposed actions such as timber harvesting, road building, and a variety of recreation activities does not transform the recovery plan into a proposed action. However, the FWS interpretation of what a recovery plan should do for grizzly bears was successfully challenged in court.

The Service maintains that, with some exceptions such as reintroduction of wolves and grizzly bears, recovery plans are merely advisory and therefore the Service does not have to do environmental analysis required for "major" federal actions under NEPA. Periodically, the Service will issue "incidental take" permits to nonfederal entities, but only after they have prepared an EIS.

The paperwork requirements under NEPA have become onerous in order to fend off the rain of challenges that complex procedural laws such as NEPA spawn. NEPA, to be sure, is a well-intentioned law that, like the ESA, forces federal agencies to consider the impacts of their actions. NEPA is entirely procedural, and does not require the agencies to implement the alternative with the least environmental impact, the least cost, the most benefits, the most efficient, the most

environmentally benign, or anything else. The goal of NEPA, expressed in implementing regulations, is better decisions, and informed public participation and informed decision-making is required (M. Feldman, review comments). But in the end, NEPA only requires paperwork. Interdisciplinary paperwork, yes; paperwork documenting public participation in the process, yes. But the final decision rests with the action agency, not with the NEPA process.

### Conclusions

Most people would agree that the ESA has been less than perfect in its protection of imperiled species, and some kind of change would improve its effectiveness. The question is, what kind of change? Those who call for the complete repeal of the ESA probably will not succeed because endangered species protection has substantial public support. Those who call for no change probably will not succeed either because species conservation under the ESA has become a highly-charged public policy issue.

The changes that seem likely are either modification of the existing statute, or a new statute in addition to ESA. Any new statute, such as an ecosystem protection act or biodiversity trust fund, would take a substantial amount of political maneuvering to become reality. Thus the most likely scenario is incremental modification of the existing Act.

This chapter did not try to point out every place the Act could be changed, but instead suggested sections where change might improve the Act's effectiveness. Change does not have to "weaken" or "strengthen" the ESA, but it should lead to more effective recovery of threatened and endangered species.

## Appendix A: Conservation Biology Issues

This technical appendix analyzes some of the major issues in the science of species conservation, especially the relatively new discipline called conservation biology that deals with such issues. Some sections of this appendix were drafted by Troy Merrill.

### The "Extinction Crisis" and the Extirpation Dilemma

Darwin's theory of evolution implies that species either adapt to changes in their environment or they go extinct. By one estimate, less than one percent of all the species that have ever existed are alive at present—more than 99 percent have become extinct (Wilson 1992).

Extinction is a normal and necessary part of evolution. We should therefore not be disturbed by the loss of some species, because extinction is not necessarily evil (Levine 1986). However, recent actions by humans seem to have drastically increased the rate at which species become extinct. Since 1600 at least 700 animal species have become extinct—290 mammals, 200 birds, and 210 reptiles and amphibians.

People bring species to the point of extinction by two principal methods. The most obvious method is unrestrained killing, which exterminated the great auk and the dodo, whose lack of fear made them easy prey for sailors. Habitat deprivation has now become the more prevalent means of eliminating species. Loss of cover, habitat, forage, or prey will destroy viable breeding populations of animals, as will overhunting (Cubbage et al. 1993). Pollution and contamination of habitat, as well as destruction, have also contributed to extinction (J.M. Scott, review comments). Run-ins with vehicles also have caused the loss of many animals in developed countries. Loss of plant species may be caused by harvesting, clearing, or converting forest lands, grasslands and other native vegetation to some other use (Cubbage et al. 1993).

Efforts were made at the end of the nineteenth century to save some of the nation's most beautiful, useful, or historic animals.

The public paid little attention to species other than egrets, herons, bison, or antelope, even though the extinction of the passenger pigeon saddened many. Extinction became an important issue after World War II when economic development flourished, accompanied by habitat destruction. The public's new appreciation of ecosystems made people want to save all species as parts of a whole, arguing that they all have a place and purpose on earth. These ideals were enthusiastically written into law as Congress passed endangered species acts in 1966, 1969, and 1973 (Dunlap 1988).

Much has changed since the initial policy efforts to prevent premature extinction in 1966, when a small protection program was envisioned at a time when extinction was neither a pressing scientific problem nor a hot political issue as it became at the beginning of the 1990s. Now the pace of extinction throughout the world has led some scientists to fear the onset of an irreversible environmental catastrophe. Several agencies share the responsibility for implementing the U.S. policy to prevent extinction, and they must cope with inadequate financial support, poor organizational resources, uncertain public support, and frequently, political antagonism and interference (Tobin 1990).

Many endangered species issues are related to what is generally referred to as the "extinction crisis." Some of these problems would be more accurately portrayed as extirpation dilemmas. Extinction means the loss of an entire species. Extirpation means the loss of a subspecies or a local population. Many of the listed species in Idaho face extirpation, not extinction. Table 15-1 identifies the 18 listed species in Idaho. The 8 species indicated by \* are local populations of species abundant elsewhere.

Some people believe the world is in a period that can be categorized as an "extinction crisis" and that an immediate response is required. This sense of crisis is driven by the accelerating rate of species extinction in the 20th century, estimated to have increased from 40 to 400 times the normal or non-human caused rate (Ehrlich and Ehrlich 1981). The key word is "estimated." To illustrate the magnitude of the problem, consider that during

a 3,000 year period during the Pleistocene era, which included the most recent ice ages, it is estimated that 50 mammalian species and 40 avian species went extinct in North America. In the period of time since the Pilgrims landed at New Plymouth in 1620, more than 500 species and subspecies that inhabited the same area have become extinct (Rohlf 1989, Chadwick 1995). The rate of extinction surpasses the rate at which new species are appearing, resulting in an environment with reduced biological diversity and possibly fewer evolutionary alternatives for the future. Two conservation biologists said,

Perhaps even more shocking than the unprecedented wave of extinction is the cessation of significant evolution of new species of large plants and animals. Death is one thing—an end to birth is something else, and nature reserves are too small (not to mention, impermanent) to gestate new species of vertebrates. (Soulé and Wilcox 1980, p. 8).

The justification for species conservation was well stated by Sen. Max Baucus (D-Mont):

The destruction of habitat is causing extinctions to increase at an accelerated rate. ... According to E.O. Wilson, the worldwide extinction rate now is about one species per hour. And Norman Myers predicts that the earth will lose several hundred species per day by early in the next century. (*Congressional Record*, Senate, May 6, 1993, p. 5657)

Many people believe these alarming statements warrant protecting species "whatever the cost," which leads to the question, are these estimates valid? (Lambert and Smith 1994, p. 39).

The International Union for the Conservation of Nature (IUCN) inquired into the question of extinction rates in tropical forests (Whitmore and Sayer 1992). The IUCN report expressed concern about extinction, but stated some scientific concerns about rates of extinction:

IUCN, together with the World Conservation Monitoring Centre, has amassed large volumes of data from specialists around the world relating to species decline, and it would seem sensible to compare these empirical data with the global extinction estimates. In fact, these and other data indicate that the number of recorded extinctions for both plants and animals is very small and so much of the evidence for the high

extinction rates predicted is indirect. Such predictions are therefore to be regarded as hypotheses. (Heywood and Stuart 1992, p. 93)

Heywood and Stuart (1992, p. 99) concluded "that theory and reality do not converge on the matter of extinction rates," and "that the prediction of extinction rates is an almost impossible task" (p. 107). However, what is uncontested is that a number of human-related extinctions have occurred (J.M. Scott, review comments).

### Conservation Biology Principles

Conservation biology is a mission-oriented discipline that focuses on one issue—the conservation of the natural world and is tied to biological disciplines ranging from the molecular to the population level, but draws also from natural resource management disciplines, the social sciences, and the humanities (Soulé 1985).

The goal of conservation biology is to provide principles and tools for "preserving biological diversity" (Soulé 1985). A good place to begin to understand what it is all about is to define biological diversity. A diverse group of sixty individuals did that under the guidance of professional mediators from the Keystone Center (1991):

What is biological diversity?[a] In the simplest of terms, biological diversity is the variety of life and its processes; and [b]It includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

Conservation biologists rely in part on theories based on island biogeography, or what is sometimes called insular ecology. Studies of islands have allowed biologists to develop a better understanding of population dynamics, particularly processes whereby new species are created and existing species become extinct. Most studies show that isolated populations are more vulnerable to environmental disruptions and disease epidemics than their mainland counterparts. The most frequently cited reasons for this increased vulnerability are decreased genetic diversity, reduced colonization, and inability to migrate away from disturbance. Because preserves and other

protected areas are ecological islands surrounded by developed areas that can act as barriers to dispersal and colonization, much as oceans act as barriers around geographic islands, this understanding of population dynamics is applicable to some degree to species conservation problems associated with habitat loss.

Studies of island ecologies have led to the development of theories about the relationship between species numbers and geographic area, equilibrium between extinction and colonization as a function of reserve size and proximity to other reserves, and the short- and long-term effects of insularization.

The "extinction crisis" relies heavily upon observed losses of species world wide (J.M. Scott, review comments) as well as data collected in the 1960s by MacArthur and Wilson (1967), who tallied the number of species on islands of various sizes. They constructed the theory of island biogeography, where the number of species is proportional to the area studied (Lambert and Smith 1994). The connection between species numbers and geographic area is where population is linked with habitat. Simply stated, the species/area relationship is that the larger the area, the greater the number of species that will occur within it. This conclusion follows because there is a larger amount and greater diversity of habitat present in a larger area than a smaller area. Mann and Plummer (1995c) pointed out two fallacies of extending this island-based theory to mainland habitats without any empirical basis, as did Lambert and Smith (1994): Extinction predictions probably overestimate extinction rates because they (a) treat islands and mainland habitat areas alike, and (b) fail to account for diminishing returns to area. Regardless of the verity of island biogeography theories, some habitat will be critical to the continued existence of a population of a species. In other words, habitat is necessary to sustain a viable population.

### What is a Viable Population?

Determining the size of a viable population is a central and unifying theme in conservation biology. Viable population analyses are

theoretical exercises generated through computer simulations. Such analyses are based on a number of assumptions, some of which are well founded, and some of which are simply best guesses by experts. The results of these analyses have not been tested through field experimentation with real animals and are extremely sensitive to changing the probability of persistence and the time period considered. Viable population estimates are simply probability statements and as such, the actual outcome cannot be guaranteed. For example, assume a 95% chance of persistence for 100 years. If it were possible to establish 100 separate populations of a minimum viable population of 90 grizzly bears each, under identical conditions, five of those populations would be expected to go extinct within 100 years. There is no way to predict which five would suffer that fate. With any given population, there would be a five percent chance that it would go extinct in 100 years, but as with tossing a coin, extinction (or getting heads) could occur within the first five years (or coin tosses). The simulation models assume that past populations, spatial structure, and demography can be projected into the future; that habitats and bear behavior are assumed to remain stable. Modelers also assume that data quality and reliability (see Romesburg 1981) are suitable for such complex and sophisticated modeling (MacCracken et al. 1994).

Species survival problems are related to population genetics and evolutionary genetics. Three such problems are central to viability estimates and the "time scale of survival":

- 1) the short-term issue is immediate fitness—the maintenance of vigor and fecundity during a short term holding operation, ...
- 2) the long-term issue is adaptation—the persistence of vigor and evolutionary adaptation of a population in the face of a changing environment, and
- 3) the third issue is evolution in the broadest sense—the continuing creation of evolutionary novelty during and by the process of speciation. (Soulé 1980, p. 151).

The first two of these three issues can be addressed in terms of numbers of individuals needed to maintain a viable population. Minimum population size is only now becoming understood. Work in these areas



has established that there is loss of vigor, fecundity, and other aspects of fitness proportional to the degree of random genetic change, which is inversely related to population size (Soulé 1980).

Empirical and theoretical work in these areas has resulted in the development of an array of models for predicting time to extinction. Dennis et al. (1991) used a stochastic model of exponential growth with population data for whooping cranes, grizzly bears, California condors, Kirtland's warblers, Puerto Rican parrots, palila, and Laysan finches. The statistical model for forecasting requires time series data on population sizes. Few such data sets are available.

For short-term survival an "effective" population of 50 individuals is required. Scott (review comments) noted that this rule of 50 has been seriously questioned and found wanting. A rough rule of thumb is that about 25% of the total population will be "effective" (Grumbine 1992, Soulé 1980). This means it takes a census population of 200 to provide an effective population of 50. It has been shown that an effective population of 50 will lose approximately 25% of its genetic variation over 25 to 30 generations. This loss of genetic variation translates into the loss of the species ability to adapt to changing conditions (Soulé 1980). Therefore a species having an effective population of 50, and a total population of 200, will not have a good prospect for long-term survival. For long-term survival an effective population of 500, and a total population of 2000, is felt to be necessary (Grumbine 1992).

These minimum numbers—50 for short-term survival, 500 for long-term survival—represent the bottom line for species survival. Soulé (1987) stated that such minimum numbers should be seen as a possible order of magnitude lower boundary (Wilcove et al. 1993). There is no allowance in them for demographic uncertainty, environmental uncertainty, or catastrophic uncertainty (Grumbine 1992). Populations at these minimum levels will be constantly at risk of extinction from a single unforeseen event such as disease, drought, or other catastrophic natural event. Dennis et al. (1991) said that accounting for such stochastic forces as these

uncertainties is a crucial problem for conservation biology. Rohlf (1991) noted that these stochastic events are generally discounted in ESA recovery planning.

The numbers and dynamics above are applicable to large animals where habitat fragmentation and loss results in significant decreases in population densities, and resultant increase in inbreeding depression. They are not applicable to species characterized by short generation times, small body size, high rates of population increase, and high habitat specificity. While such species may be reduced to remnant populations by habitat fragmentation, population density often remains high within the remaining suitable habitat. In such species inbreeding and other genetic effects have not been implicated in extinctions (Murphy et al. 1990). For these species, conservation efforts should consider metapopulation dynamics, which can generally be described by a pattern of frequent local extinctions resulting from stochastic events followed by rapid recolonization when conditions become favorable to the species.

Despite the shortcomings of this theoretical approach, most of which exist because of a lack of data (J.M. Scott, review comments), many scientists and environmental groups are demanding that the FWS set recovery goals based on population viability analyses. Basing policy on information with high levels of uncertainty may risk both species survival and public support for protecting species. For example, although most everyone would probably agree that a grizzly bear population of close to 4,000 is very likely to persist well into the future, that goal is currently unrealistic given the amount of available habitat in the lower 48 states (MacCracken et al. 1994).

Maintaining the genetic diversity of isolated wildlife populations has been suggested to be a key element for their long-term existence. Soulé (1980) suggested that for many species, 500 breeding individuals were needed to maintain genetic viability (but see Simberloff 1988, p. 480, for a critique). Because all members of a population do not need to breed to maintain genetic diversity, another approach to estimating a minimum viable population is to estimate the ratio of the effective population

size to total population size and extrapolate a minimum viable population using 500 individuals as a minimum effective population. Through computer simulation, Allendorf et al. (1991) estimated that the effective population for Yellowstone grizzly bears was about 25% of the total population. If 500 is used as the minimum effective population necessary to assure long-term survival of grizzly bears, then a total population of about 2,000 grizzly bears is needed (Metzger and Bader 1992). However, scientists have disputed the applicability of the 500 figure because it is based on one study of a fruit fly (Simberloff 1988). The 50-500 rule has been discounted by many scientists (J.M. Scott, review comments).

**An Evolutionary Perspective.** The third survival issue identified by Soulé (1980) was continued speciation. It dramatically increases the complexity of the problem of conserving species. In order to understand these complexities it is necessary to introduce several additional concepts.

First, prior to the 1970s the dominant paradigm in ecology was one of equilibrium. Natural systems were described as closed steady state systems that were regulated by interspecific competition, predation, or both. Natural disturbances such as fire, drought, and storms were viewed as disruptive events. It is now understood that natural systems are not closed, and the forces that were seen previously as disturbances are essential processes for system regeneration and maintenance. Natural systems are dynamic, with processes such as fire creating certain opportunities as they eliminate others.

Second, and this follows from the first, our understanding of the process of evolution has itself evolved to where it is more accurately described as co-evolution. Classical evolutionary theory depicts a process by which biological elements adapt to most efficiently utilize the resources provided by a relatively stable abiotic environment. The dominant force was seen as competition between biotic species for the limited resources available. Once all available niches were occupied, a condition of equilibrium was reached and further evolution of a species involved

refinements of its ability to utilize available resources. This classical model depends upon natural systems being closed steady-state systems. With the new understanding of the dynamic character of natural systems comes the realization that species co-evolved with these natural processes and are dependent upon them for their continued existence.

Third, an understanding of the process of speciation is necessary. Species are generally distributed over a specific area, referred to as their range. The limits of this range and the distribution of individuals within it varies with time (J.M. Scott, review comments). At the interior of the range there is much genetic variation and conditions are most favorable. Population densities are highest in the interior portion of the range, encouraging individuals to emigrate to the periphery of the range where conditions are generally less favorable. A smaller proportion of the genetic or morphological variations found at the center of the range are favored at the fringe of the range, and gradually are eliminated. Over time these peripheral groups form populations that are definable either genetically, or morphologically, or both. These peripheral populations are better adapted to local conditions and better able to respond to environmental changes. Given time, isolation, and opportunity, a distinct subspecies emerges, and under the right circumstances a new species may form. This results in an increase of the number of species. This is the basic process of evolution essential for maintaining natural variety. As new species develop, others become extinct.

Soulé (1980) looked at the question of whether tropical nature reserves will be large enough to allow speciation by higher vertebrates and plants, emphasizing them "because probably 90 percent of species are tropical" (p. 164). He said,

The largest national parks in the world would seem to be too small for the speciation of higher plants, birds and mammals.... In fact, they will contain fewer and fewer species with the passage of time because most reserves are now supersaturated and will lose species rapidly over the next few centuries. It therefore appears inescapable that, for the first time in hundreds of millions of years, significant evolutionary change

in most higher organisms is coming to a screeching halt in the tropics. (Soulé 1980, p. 166).

Soulé concluded that "Even the largest nature reserves are probably too small to guarantee the permanent survival of large herbivores and carnivores" (Soulé 1980, p. 168).

Such arguments as these paint a bleak picture for biodiversity, which, if the arguments are correct, can only decline as species are lost. If species protection is a goal, then actions that promote the loss of species should, on a biological basis, be prohibited. That is what the ESA does.

The arguments offered by Soulé (1980) could be used to argue for larger nature preserves. There is a corollary argument more directly related to the ESA. If larger nature preserves are not feasible (which may or may not be the case in the United States) and Soulé's (1980) theory is correct, then conservation biologists will have to admit that speciation of mammals, birds, and higher plants is not likely to occur, and that maintaining the evolutionary potential of existing species is pointless. As it is, evolutionary potential is sometimes used as a biological argument for protecting genetic diversity by protecting subspecies and population segments under the ESA.

### Ecosystem Linkages

Isolated populations of wildlife are exposed to three types of unique risks: 1) loss of genetic diversity, 2) susceptibility to short-term catastrophic events (such as fire, earthquake, and volcanic activity), and 3) long-term systemic changes such as global climate change with attendant vegetation shifts. Providing habitat corridors to link isolated populations has been suggested as a potential solution. Critics of the revised grizzly bear recovery plan cite the lack of protection for potential linkage zones as a major shortcoming. The FWS is conducting a five-year study of the concept (US-FWS 1993a, Servheen and Sandstrom 1993).

Isolated populations are presumed to inbreed, resulting in lowered reproductive

output and survival (Wright 1977) and loss of genetic diversity that may compromise an organism's adaptability to adapt to environmental change (Franklin 1980). These presumed genetic risks are largely the product of theory and based on computer simulations. Some of these concerns invoke evolutionary time-frames and subjective estimates of the probability of chance events. Furthermore, the relationship between genetic diversity and short-term population fitness in wild animals is largely unknown (Hendrick and Miller 1992, Caro and Laurenson 1994, but see O'Brien et al. 1990). Empirical studies have not yet demonstrated that these genetic risks apply to most wildlife populations. Nonetheless, a lack of cause and effect evidence does not mean that genetic problems do not occur (MacCracken et al. 1994).

Genetic diversity concerns influence the management of endangered species throughout the United States. The FWS tries to protect as many organisms and habitats as possible. For grizzly bears, there are two ways to alleviate these genetic risks: 1) by providing protected habitat linkage zones to facilitate movements of grizzly bears between ecosystems, and 2) by periodically capturing and relocating bears (US-FWS 1993a).

Ecosystem linkages may also be effective in reducing the effects of both short-term catastrophic events and long-term environmental changes. However, landscape-scale linkages and wildlife corridors are a relatively new but rapidly developing area of conservation biology (Noss and Harris 1986, Simberloff and Cox 1987, Noss 1987, Soulé and Gilpin 1991, Hudson 1991). There are more questions about ecosystem linkages than answers. For example, will animals actually use the linkage zones? Only research can provide an answer, but scientists must weigh the benefits of using scarce research funds for testing such a hypothesis when the establishment of wildlife corridors may result in disruptive land-use changes and an alternative method (capture and translocation) is available to diminish genetic risk (MacCracken et al. 1994).

Providing effective linkage among the various grizzly bear ecosystems requires extensive analysis and monitoring and would

also be difficult. To design an efficient and effective linkage system requires information on habitat selection by grizzlies, the resources in the zones, and the risks associated with the linkage zones. Because grizzly bears need some insulation from human contact, linkage zones would have to be subject to little human use or occupancy. Although grizzly bears can cover long distances in a short period of time (Miller and Ballard 1982), narrow travel corridors have many potential drawbacks (Simberloff and Cox 1987) and larger linkage zones of up to 100 square miles may be needed to allow for gradual movements over a number of generations (see Section II in Hudson 1991). In addition, if mortality rates are higher in linkage zones, the zones may act as population sinks, and in reality impede true recovery (MacCracken et al. 1994).

Although it would be possible to design a linkage system, relocate people, reroute or reconstruct highways to facilitate movement (or assume that grizzlies will successfully cross these obstacles), restrict motorized use of some roads on public lands, and limit human access, political realities likely preclude the adoption of such a scheme at this time. It may be that human settlement and activities have progressed to the point that adequate habitat linkages no longer exist. Political realities are, of course, subject to change (MacCracken et al. 1994).

Ecosystem management programs, the assumed future direction in federal land management, would probably benefit and be more feasible with the retention of large areas of refugia and connectivity. Providing ecosystem linkages suggests a number of possible population structures for grizzlies: 1) a single population with grizzlies permanently occupying the linkage zones as well as the ecosystems, or 2) one of four metapopulations with varying amounts of dispersal from neighboring ecosystems (Hanski 1991, Harrison 1991, 1994, Hansson 1991). Proponents of ecosystem linkages have not identified which type of population structure they are advocating. As noted, a metapopulation structure may be able to persist as long with fewer individuals than a single population, but letting some local populations go extinct and counting on recolonization is

perhaps biologically and politically risky. However, there may not be enough habitat, even with ecosystem linkages, to support enough grizzlies to maintain a single population encompassing all the ecosystems (MacCracken et al. 1994).

Although the FWS is currently beginning a five-year assessment study of potential linkage zones among the various grizzly bear ecosystems (US-FWS 1993a, Servheen and Sandstrom 1993), the agency currently appears to favor the capture and translocation alternative for grizzly bears over the ecosystem linkage approach. The agency is currently augmenting the Cabinet/Yaak population with bears from Canada to boost that population (Servheen et al. 1987, Kasworm et al. 1993) and suggests that the results of these efforts can be used to develop an augmentation program for increasing genetic diversity in the Yellowstone Ecosystem, which it has suggested is in the greatest need of augmentation for genetic reasons (US-FWS 1993a). Simberloff (1988) stated that the available research indicated that dispersal by a relatively small number of individuals was adequate to offset many of the negative effects of isolation on wildlife populations (MacCracken et al. 1994).

There is a paucity of data on the effectiveness of wildlife corridors as a conservation tool, and there are few scientifically-based guiding principles for designing and evaluating them. Additional criteria need to be considered in the theoretical framework for evaluating and designing wildlife corridors (Lindenmayer and Nix 1993).

### **Conservation Biology and Public Policy Advocacy**

The mission-oriented approach of conservation biology has led some practitioners to call openly for advocacy in defense of non-human organisms, and to become actively involved in policy issues. This is an ongoing debate among conservation biologists. Two authors of recent conservation biology textbooks—Reed Noss (Noss and Cooperrider 1994) and Gary Meffe (Meffe and Carroll 1994)—are of the opinion that biological scientists have an

obligation to become policy advocates.

Noss, currently the editor of the journal *Conservation Biology*, wrote:

[B]iological scientists can help protect Nature through reasoned and impassioned advocacy, and that we can do so without sacrificing the basic tenets of science: clear observation, honesty in stating assumptions and reporting results, and rational and objective reporting of results. Being an advocate does not mean being a zealot or a liar. Being an advocate means being honest about your feelings to the Earth, the feelings that attracted you this field in the first place, and letting people know the way you feel. It means paying a debt of gratitude to the biota that keeps you employed....

Most biologists do not think of themselves as soldiers. But war has been declared against wild Nature, and we who are best acquainted with that marvelous web of life have no moral choice but to defend our nonhuman friends and relatives, the innocent victims of human greed, ignorance and arrogance. Our defense is not contingent on probabilities of winning or losing; it is an absolute obligation....

It is time to follow our hearts and apply our brains to the most important war ever fought. (Noss 1991a, pp. 59-60).

Meffe wrote in the *Wildlife Society Bulletin* of the conservation biologist's "mandate" to affect conservation policy:

As Soulé (1985) told us a decade ago, conservation biology is a crisis-oriented discipline with a clear, value-laden purpose: protect and restore biological diversity on the planet. Scientists can take a clear stand that biodiversity is good, that functioning and intact ecosystems are good, that continued evolutionary change and adaptation are good, and that diversity and variation in general is good. Scientists cannot and should not remove themselves from these usually unstated value judgments. It is quite acceptable (in fact, unavoidable), in our opinion, to hold values as a

scientist and try to influence the policy process, as long as the scientific process of objective hypothesis testing is not compromised. Thus, the first answer to how scientists can affect the policy process is to agree that they should, and must, fulfill their obligations to influence policy, recognizing that they are both scientists and citizens. (Meffe and Viederman 1995, p. 328).

Should scientists take an advocacy stance toward public policy? If they do, they risk their credibility (Brussard et al. 1994).

## Conclusions

The Balcones Canyon Conservation Plan was a reserve system designed by conservation biologists to protect the habitat of two listed bird species in the hills surrounding Austin, Texas. The plan could not be implemented as designed. It was simply too expensive. The situation was described by Mann and Plummer (1995c) in order to illustrate a significant point. Scientists are not by virtue of their specialized expertise well equipped to make land-use decisions that affect the lives of people. Scientists are trained to describe the way things are, or the way they could be. They are not trained to say how things ought to be. That is a public policy.

In the 1980s, conservation biology became a multi-disciplinary approach to develop theories and applications in support of species conservation. Consistent with the ESA mandates, conservation biology developed knowledge related to single-species management, and has focused a considerable amount of effort on determining viable population levels, or population viability analysis. This knowledge is essential for setting recovery goals for effective species conservation.

## Appendix B: Case Example—Snake River Salmon

This case example illustrates the shifting of resource management control driven by the ESA and ESA section 7 consultation problems. Kelly Rogers and Troy Merrill contributed portions of this chapter, and many reviewers provided comments that are acknowledged herein.

Salmon are anadromous fish—that is, they ascend rivers from the sea to propagate the next generation. Salmon are considered by many people to be an important part of the legacy and identity of the Pacific Northwest region. During the last 100 years, the annual runs of adult salmon in the Columbia River system have declined by an estimated 75 to 85 percent, according to the Northwest Power Planning Council, an agency expressly created by federal statute to ensure that fish and wildlife receive "equitable treatment" in operations of the Columbia River system (Pacific Northwest Electric Power Planning and Conservation Act of 1980, 16 USC § 839). Some Snake River salmon runs have already gone extinct—including all wild coho salmon—while others, such as the run of sockeye salmon, have dwindled from thousands to an average returning run of 8 per year between 1986 and 1992. Dams constructed on the rivers for power generation and flood control are widely recognized to be the largest human-caused factor behind the increased salmon mortality and population declines. Other contributing factors are fishing, withdrawals of water for irrigation, and land-use practices that affect the stream habitat where adult fish spawn and young salmon spend their early lives (Hyman and Wernstedt 1991).

Salmon and steelhead use tributary streams in the Snake and Salmon River systems for spawning and rearing. The majority of the habitat for threatened and endangered salmon is in Idaho. Newly hatched salmon spend from 1 to 12 months in a freshwater stream, then begin a migration in the spring downriver to the Columbia and then out to the Pacific Ocean. Salmon spend from one to five years (mostly 2 or 3) in the ocean before making the return migration to the freshwater streams of

their origin, where they spawn and die. Most steelhead spend two or three years in the ocean, and not all of them die after spawning in their streams of origin. Idaho salmon and steelhead travel great distances in their life-cycle migrations. These fish may travel more than 900 miles inland from the ocean and encounter elevation changes of as much as 7,000 feet (Feldman 1995).

Salmon conservation under the ESA "made the radar screen" in Washington, D.C., in the spring of 1994, according to Secretary of the Interior Bruce Babbitt (Titone 1994b). This awareness is crucial because changes in the region's hydropower system would take massive infusions of federal cash. Secretary Babbitt said, "We're going to have to relentlessly ask, in a universe of limited resources, how do we do the most for salmon with each dollar?" (Titone 1994).

### Listing History

Hydropower and other water project dams have been at the center of controversy over salmon survival for decades. More than 30 years of relatively unproductive negotiations between parties representing salmon and industrial water uses led to the first salmon listing under the ESA in 1989 in California's Sacramento River. Barker (1991) chronicled some of the history during the 1980s, including concerns about the Snake River chinook dating back to 1978.

In 1990, the Shoshone-Bannock Tribes of Idaho petitioned NMFS to list the Snake River sockeye salmon as an endangered species. Following the tribe's lead, a coalition of environmental groups petitioned the NMFS to list coho salmon in the lower Columbia River, as well as the spring, summer, and fall runs of chinook salmon in the Snake River, as endangered (Hyman and Wernstedt 1991). A low of 78 individuals of the fall run of chinook salmon were known to have returned to the Snake in 1990, but have since increased to 318 in 1991, 533 in 1992, 742 in 1993, and 404 in 1994 (NMFS 1995b). Estimated natural spring/summer chinook adults passing Lower Granite Dam were 3,410 in 1991, 3,493 in 1992, 7,901 in 1993, and 1,822 in 1994 (NMFS 1995b). Snake River sockeye have

declined to near extinction, with four fish returning to Redfish Lake in 1991, one in 1992, and eight in 1993 (NMFS 1995b).

As required by the ESA, the Service had one year from the date of petitioning to decide whether to propose listing for any of the runs. In response to the petitions, the NMFS determined wild coho had gone extinct. In April 1991, the secretary proposed that the Snake River sockeye be added to the endangered species list, and in June the secretary proposed that the spring, summer, and fall runs of chinook be listed as threatened, not endangered (Hyman and Wernstedt 1991). Spring/summer chinook in the Clearwater River were excluded from listing (Bowles, review comments). Multiple factors led to the listing (Table B-1). The NMFS choose to treat the spring and summer runs together, and decided to list chinook as threatened, "after taking into account those efforts being made to protect the species." A reclassification to endangered seemed inevitable (Houck 1993), and it occurred in August 1994 as an emergency reclassification pending a final rule. The emergency rule expired in May 1995 so the species are threatened due to the moratorium on listing final rules passed by Congress in April 1995.

### National Forest System Impacts

There are many ways to indicate how salmon conservation efforts have impacted the national forests in Idaho that provide spawning and rearing habitat. Most of the observations in this section are from an interview on August 2, 1993 with Phil Jahn, ESA coordinator for the Nez Perce National Forest, conducted by Troy Merrill, and from later review comments by Mr. Jahn.

**Background.** The Nez Perce National Forest manages a significant portion of streams considered to be important spawning and rearing habitat for endangered spring/summer chinook salmon. Because streams are distributed throughout the forest, virtually any ongoing or planned activity must be reviewed for its potential to affect salmon recovery. Mike King, the forest supervisor, estimated that between February 1993 and April 1995,

approximately 25-35% of staff time was involved in some aspect of the section 7 consultation process for salmon recovery. Much of this staff time was spent preparing a comprehensive cumulative effects assessment for the Selway River, Clear Creek, South Fork Clearwater River, Lower Little Salmon/Rapid River, Lower Main Salmon River, and the Salmon River tributaries. Baseline conditions have now been defined, and consultation and analysis workloads are expected to be much less complex (P. Jahn, review comments).

Forest staff have not accounted for the costs of consultations. However, they estimated the increased costs for salmon consultation to be roughly \$2 million through 1993. (P. Jahn, pers. comm.).

In addition to increased costs, the consultation process has caused the delay of planned activities, most notably two large timber sales in the Cove-Mallard area. According to a newspaper interview with the owner, the delay of the two sales caused the elimination of one shift at the sawmill in Elk City. It is difficult, however, to attribute the delay of these sales entirely to salmon consultation. In the 1980s, one of these sales—Jersey Jack—was delayed due to litigation arising from consultation regarding gray wolf protection (see *Thomas v. Peterson* 753 F. 2d 754 [1985]). The Cove-Mallard/Jersey Jack area is located between two wilderness areas, and this is of great concern to many citizen conservationists, who since the early 1990s have camped there during the summer and engaged in civil disobedience to delay these timber sales. The symbolic values associated with the area are significant enough that Wilkinson (1992, pp. 8-9) used the Jersey Jack controversy to begin his book *Crossing the Next Meridian: Land, Water, and the Future of the West*, in which he argued that the real environmental issue in the Cove-Mallard/Jersey Jack area is salmon conservation.

Jahn (review comments) said Professor Wilkinson was off the mark when he assessed the importance of salmon in the Cove-Mallard/Jersey Jack area. The Crooked Creek watershed is the only one of high importance for salmon recovery in the area, and it is a relatively small part of the Cove-Mallard proposal. Members of the Nez Perce

Table B-1. Factors in the decline of Snake River salmon, as identified by the seven scientists on the Snake River Salmon Recovery Team, under the five categories of factors in the Endangered Species Act, Section 4(a), "Determination of Threatened or Endangered Status."

1. Destruction or Curtailment of the Species Habitat and Range
  - a. Timber management
  - b. Grazing
  - c. Mining
  - d. Hydropower development
    - Juvenile fish passage
    - Adult fish passage
  - e. Water withdrawal and storage
2. Commercial, Recreational, and Native Ceremonial and Subsistence Harvest
  - a. Snake River spring/summer chinook harvest
    - Ocean harvest
    - Columbia River non-treaty harvest
    - Columbia River Indian fisheries
    - Tributary harvest
  - b. Snake River fall chinook harvest
    - Ocean harvest
    - Columbia River commercial, recreational, and tribal harvest
  - c. Snake River sockeye harvest
3. Disease and Predation
  - a. Disease
  - b. Freshwater predation
  - c. Marine predation
4. Inadequacy of Existing Regulatory Mechanisms
  - a. Fish and Wildlife Coordination Act
  - b. Federal Power Act
  - c. Salmon and Steelhead Conservation and Enhancement Act of 1980
  - d. Mitchell Act of 1938, as amended
  - e. State laws
    - water allocation, water quality, and riparian and wetland protection
  - f. Harvest regulation
    - Management of Snake River stocks separate from other Columbia River stocks
    - Salmon by-catch in high seas squid fishery
  - g. Pacific Northwest Electric Power Planning and Conservation Act of 1980
  - h. Pacific Northwest Coordination Agreement
5. Other Natural and Manmade Factors
  - a. Natural factors
    - Droughts
    - El Niños
  - b. Manmade factors
    - Artificial propagation

Source: Snake River Salmon Recovery Team (1993).

National Forest staff will re-examine that part of the timber harvest proposal to ensure that Crooked Creek salmon habitat is not compromised. Salmon habitat in the

remainder of the Cove-Mallard area is very limited, and many other areas in the forest are more important for salmon recovery (P. Jahn, review comments).



**Consultation Process.** An interagency consultation process is required by the ESA (§ 7) to determine if federal actions will cause "jeopardy" to a protected species. "Jeopardy" opinions in the Idaho salmon situation have been based on whether or not agency actions promote recovery, not just survival (P. Jahn, review comments).

Triggered by a report published by the American Fisheries Society on declining conditions of salmon stocks in the Pacific Northwest (Nehlsen et al. 1991) and the listing of salmon, the U.S. Forest Service and the BLM developed a PACFISH strategy to streamline federal agency consultation requirements under section 7 of the ESA. PACFISH was finalized in February 1995. It provides broad interim guidelines on activities in national forests in order to prevent habitat degradation and increase the likelihood that project-specific decisions will meet ESA requirements to protect fish through specific habitat management standards (Feldman 1995), until such time as a process called Watershed Analysis can be accomplished.

With the adoption of PACFISH and through the Biological Opinion on forest plans issued by the NMFS (1995a), the agency further defined its expectation that actions were to promote salmon recovery. PACFISH will maintain the status quo on federal land watersheds not identified as having high priority for salmon recovery. A group of interagency scientists has identified a list of High Priority Watersheds to which specific conservation actions will be taken in addition to PACFISH (see NMFS 1995a) in order to promote faster recovery and protect possible key refuge areas from degradation (P. Jahn, review comments).

The secondary purpose of PACFISH was to augment requirements under the National Forest Management Act for 10-15 year plans for each national forest. These were described as follows by Phil Jahn (pers. comm.) in August 1993.

Historically, the USFS has evaluated actions on a project-by-project basis, with each project evaluated against forest plan standards to determine if they had any "significant impact." Moving the unit of analysis to the watershed level means that "cumulative effects" must be

considered. While the need for cumulative effects assessment has been realized by the USFS and other land managers for some time, the methods of doing cumulative effects analysis have not been well developed. These methods are being developed in response to Clean Water Act requirements, exemplified by the publication of a "Forest Practices Cumulative Watershed Effects Process for Idaho" produced by a task force under the leadership of the Idaho Department of Lands (IDL 1995).

Linked to the cumulative effects issue is the difference between "no effect" and "no significant impact." No significant impact, as used in USFS evaluations, refers to whether or not an individual project will exceed standards and guidelines established in the forest plans that must be prepared for each forest according to the National Forest Management Act of 1976. These standards and guidelines frequently allowed for some degrading of conditions, and projects that were found to have "no significant impact" were allowed to proceed because even though they had some effect, it was within the standards and guidelines. "No effect" as interpreted by the NMFS means no effect, and is not referenced to standards and guidelines in the forest plans. Until February 1995, the NMFS did not consider any of the forest plan standards in the Columbia Basin as satisfactory to protect fish (P. Jahn, pers. comm.). Now the PACFISH interim strategy has been adopted and certain High Priority Watersheds have been identified upon which salmon recovery efforts will be focused (P. Jahn, review comments).

Actions that may adversely affect salmon are not restricted to discrete actions such as timber harvest. Almost any activity by both USFS personnel and private parties, such as highway projects and transporting or storing toxics such as gas, oil, diesel fuel, etc. may adversely affect salmon. These activities therefore require formal or informal consultation under section 7 of the ESA. Helicopters are now used for a substantial amount of logging in Idaho and compared to other logging methods may help minimize ground disturbance and sedimentation. However, helicopters require the transportation and storage of large amounts of fuel, so their

use is indirectly constrained by the risk of an accidental fuel spill that could potentially be lethal to salmon (P. Jahn, pers. comm.).

The consultation requirements for salmon redirected personnel from routine watershed monitoring between 1991 and 1993. In 1993, the Nez Perce National Forest was in the process of establishing baselines for each watershed. Once the baseline is established, consultation will be much quicker, and planned activities such as road maintenance and logging that may have an adverse effect may be allowed to proceed if the adverse effect is compensated for by improving conditions at another location in the watershed (P. Jahn, pers. comm.). Costs of forest outputs will go up and available outputs may go down. It is still too soon to project the long term effects on commodity production that have resulted from salmon-related ESA restrictions. At this time, most delays in forest programs are due to the procedural aspects of ESA compliance rather than operational aspects that can be implemented on the ground (P. Jahn, review comments).

The formal consultation process for salmon conservation prior to PACFISH was described in a Memorandum of Understanding (MOU) between the NMFS and Supervisors of the Bitterroot, Clearwater, Nez Perce, Boise, Salmon, Challis, Payette, Sawtooth, Umatilla, and Wallowa-Whitman National Forests. There were two major elements in the MOU: 1) a process for immediate consideration of proposed and ongoing projects on a watershed basis, and 2) a process of watershed analysis for determining standards and procedures necessary to recover the listed salmon and which would lead, if warranted, to amendments of forest plans, which has since been subsumed into the PACFISH process (A. Smith, review comments). It should be noted that this agreement had to be negotiated between two agencies in two different federal departments (Agriculture and Commerce) and within the U.S. Forest Service between 10 National Forests in three separate Forest Service Regions (1, 4 and 6).

The MOU was signed on February 16, 1993, and defined ongoing actions as "actions that have been implemented or that have contracts awarded" and proposed actions as

"actions that are not ongoing, but are planned for implementation in 1993." The MOU established that watershed analysis units, delineated on a map to be provided to the NMFS, will be the unit of analysis of ongoing and proposed actions; and indicated that individual forests will determine which ongoing and proposed actions have "no effect" on protected salmon. Those projects having "no effect" will not be submitted to the NMFS for consultation. Those actions that "may affect" will be grouped by geographic area into watersheds and sub-grouped by resource (range, timber, mineral, recreation, etc.). Forests will use the Biological Evaluation/Assessment outline agreed to by the NMFS, USFS and BLM to reshape their consultation packages by watershed and resource. For actions "likely to affect," determination will be made whether the effect will be beneficial or adverse. For those actions having adverse effects, Regional Foresters will request formal consultation with the NMFS. Requests to the NMFS will be prioritized, with grazing allotments having the highest priority, and a request for a date by which consultation will be completed will be submitted to the NMFS by Deputy Regional Foresters. The NMFS will complete consultations in the order requested. Success of the process is dependent upon the national forests providing detailed descriptions of management prescriptions, mitigation measures, and the monitoring and evaluation that will be done. The MOU on the surface dealt with administrative detail—who will be told what, and when will they be told. Underlying the administrative process is a complete revision of the way in which the U.S. Forest Service must evaluate the impacts of management actions.

***Salmon Litigation and National Forests.*** In Idaho, 39 percent of the land in the state is in the National Forest System and managed by the U.S. Forest Service. One-third of the land throughout the Columbia River Basin is national forests, which have more than one-half of the remaining suitable habitat for salmon in the basin (Feldman 1995). Designated critical habitat for Snake River salmon means timber harvesting, mining, road

construction, livestock grazing, and land management activities in general may require special management considerations (58 *Fed. Reg.* 68,545 [Dec. 28, 1993]).

The U.S. Forest Service—together with the BLM, which manages another 23 percent of Idaho's land—have developed the PACFISH strategy, which began in 1991 and was finalized in February 1995 (PACFISH 1995). The PACFISH goal is to prevent further habitat degradation and increase the likelihood that project-specific decisions will meet ESA-imposed measures to protect fish. The principal tool for doing so is riparian habitat conservation areas and the development of specific habitat management standards for anadromous fish-producing watersheds in the Columbia River Basin east of the Cascade Range (Feldman 1995).

In spite of these efforts, and notwithstanding the MOU described in the previous section, citizen conservation groups have used the ESA to try to attain swifter and more far-ranging action. According to Feldman (1995), the *Pacific Rivers* cases against the Forest Service represent efforts by two environmental groups—the Pacific Rivers Council and the Wilderness Society, with the Sierra Club Legal Defense Fund pleading their case—to force ESA information into the Forest Service decision making process at both the plan- and project-specific level. These cases also seem to be part of a broader effort to reduce timber and other resource extraction activities on national forest land, or at least to redefine the balance of commodity uses with other forest resource values (Feldman 1995).

Smith (review comments) summarized what occurred:

Environmental groups sued to force re-initiation of consultation on forest plans adopted prior to the salmon listing. In addition, plaintiffs requested an injunction against all future and ongoing projects on the forests which might affect salmon, until such time as the consultation of forest plans was complete. This injunctive relief was requested regardless of whether or not individual consultation had determined a project was unlikely to affect or had resulted in biological opinion concluding no jeopardy. In the first case in Oregon, Judge Marsh sided with the plaintiffs, but declined to enjoin ongoing projects approved by NMFS or

determined by Forest Service biologists to be unlikely to affect, because the merits of these decisions were not challenged by plaintiffs. The 9th Circuit reversed, closing down almost all consumptive uses on the two Oregon forests. In the Idaho case, Judge Ezra, applying the precedent established in the Oregon case, enjoined virtually all ongoing mining, logging, road construction, and grazing on six national forests. (A. Smith, review comments).

The remainder of this section provides more detail on the *Pacific Rivers* litigation. In October 1992, a suit was filed alleging the USFS had violated section 7 of the ESA by failing to consult with the NMFS on the effect of forest plans for the Umatilla and Wallowa-Whitman National Forests in the Blue Mountains of northeastern Oregon. District Court Judge Malcolm Marsh ruled for the plaintiffs in November 1993 (Associated Press 1993c). Site-specific consultation with the NMFS was inadequate and forest-wide consultation is necessary (*Pacific Rivers Council v. Robertson*, 854 F. Supp. 713, 723 [D.Or. 1993], *aff'd in part, rev'd in part*, 30 F.3d 1050 [9th Cir. 1994]).

In March 1994, Federal District Judge Malcolm Marsh had ruled in another suit filed by the Idaho Department of Fish and Game that the NMFS had violated the ESA and must do more to save Snake River salmon (Loftus 1994a). This suit (*Idaho Dept. of Fish and Game v. NMFS*, 850 F. Supp. 886 [D.OR. 1994]) was vacated as moot by the Ninth Circuit on June 1, 1995 and thus has no precedential authority. Nonetheless, Judge Marsh said he intended to become a player in salmon recovery efforts. He expected all parties to work together in a cooperative manner (Loftus 1994b).

The citizen groups asked for an injunction to stop activities in the two Oregon forests, which was granted by the 9th Circuit Court on July 29, 1994 (Alexander 1994). This essentially forced the Regional Forester to shut down almost all timber, range, and road projects on these two forests pending the completion of forest-wide consultation (Alexander 1994, Feldman 1995). Timber sales already contracted and all grazing near salmon streams were suspended (Wickline 1994a).

Buoyed by their success in the Oregon case and the activist role of Judge Marsh, the citizen groups filed suit (*Pacific Rivers Council v. Thomas*, 873 F. Supp. 365 [Idaho 1995]) against six national forests in Idaho on April 11, 1994, and asked for an injunction there on August 29 (Alexander 1994, Loftus 1994c). Public opinion ran high on the issue. Writing from the nation's capital, Swisher (1994) reported these interrelated activities in his weekly journalistic commentary for September 5, 1994, as "How the salmon came to look like a spotted owl." Mitch Sanchotena, the executive director of Idaho Salmon and Steelhead United, a group of sport fisherman, said, "Frivolous lawsuits of this nature against the Forest Service and attacks against Idaho's logging and livestock industries only gives salmon and steelhead a bad image in the eyes of elected leaders. All you have to do is travel through the Frank Church wilderness to recognize that Idaho is not habitat-limited for these creatures." (Associated Press 1994a). However, much of the productive spawning habitat lies outside the Frank Church Wilderness, in the South Fork of the Salmon, Lemhi, and Pahsimeroi Rivers.

U.S. District Court Judge Harold Ryan in Boise was to have heard the Idaho case, but due to his illness, it was reassigned to Judge David Ezra in Hawaii. Judge Ezra granted an injunction on January 12, 1995, halting "new timber sales, range activities, mining activities, or road building projects until formal consultation" on the forest management plans is completed. The decision required the Forest Service to stop all activities already announced or under way that might harm the salmon. Judge Ezra cited Judge Marsh's ruling against the Oregon forests (Associated Press 1995b).

On January 20, 1995, Judge Ezra decided to delay his injunction for at least a week while the 9th Circuit Court considered appeals (Loftus 1995a). On January 25, Judge Ezra stayed the injunction until March 15 to allow the NMFS to complete its consultations and clear the way for permanent removal of the injunction. The environmentalists, aware of the probable black eye they got from the injunction, came to the judge with the proposed stay. Judge Ezra agreed, although he was somewhat chagrined by being forced to

impose the injunction and then have the plaintiffs pull back their request (*Public Lands News* 1995a; M. Feldman, review comments). Critics of the ESA immediately jumped on the original injunction and demanded a rewrite of the ESA.

On March 8, 1995, Judge Ezra dissolved the injunction based on the completion of NMFS consultation on the plans for all the forests (A. Smith, review comments). The environmental plaintiffs said the temporary injunction had the exact effect they intended—to "get the Forest Service to proceed with the consultation." In the end, the injunction forced implementation of PACFISH rules earlier, and provided both protection and certainty in time for the spring and summer seasons (R. Barker, review comments).

**Lessons from Litigation.** The lessons from salmon litigation are many. Some of them from the *Pacific Rivers* suits are covered in the next section.

One lesson seems to stand out from all the rest, and is from Judge Malcolm Marsh's ruling in *Idaho Dept. of Fish and Game v. National Marine Fisheries Service*. In the conclusion of his ruling that the federal agencies were not doing enough for salmon, Marsh said the lack of attention by federal agencies to state and tribal proposals helped lead to the lawsuits and his ruling (Loftus 1994d). Judge Marsh wrote, "Thus, the underlying root of the litigation problem is the feeling of these parties that the federal government simply is not listening to them" (*IDFG v. NMFS*, 850 F. Supp. 886, 900 [D. Or. 1994]).

Does the lesson require elaboration or analysis? Yes, to be sure the point is clear. The judge's point is that in implementing the ESA, the federal government is not paying attention to the states and the tribes. Why? Is it bureaucratic inertia, the demanding requirements of the ESA, or both? If we give public servants the benefit of the doubt, then it must be the law. The ESA gives the Service responsibility for following complicated procedures as well as making substantive judgments about the nebulous term "jeopardy."

The examples that follow illustrate how difficult these consultation tasks are. The

Service—in this case the NMFS is the consulting agency—causes delays, to be sure, but that is only because the Service has a responsibility to obey the law.

### State and Private Impacts

The five subsections that follow in this section describe the impacts of recent legal actions in the salmon case, both under the ESA and litigation that it has inspired. The first looks at salmon recovery in the Salmon River (a tributary of the Snake River) from the vantage point of Salmon, Idaho. The other four subsections look at the impacts of salmon recovery on grazing permittees, timber sale operations, recreational fisheries, and river rafting.

These different examples all have one thing in common. It is difficult to determine what constitutes "jeopardy" to salmon. The definition of this term as a standard for use in consultation under section 7 of the ESA is vague. The point of the following illustration is that the uncertainty poses a burden on the agency that must make the "jeopardy" determination, which translates into uncertainty for people affected by the decision.

***Salmon Litigation Viewed from Salmon, Idaho.*** This section presents opinions of the residents of Salmon, Idaho and other Idahoans who feel negatively about the *Pacific Rivers* suit.

It seemed inevitable in February 1992 that Snake River chinook salmon were going to be listed under the ESA, and that communities hundreds of miles from the mainstream dams and ocean feeding grounds would be asked to do their share to help with salmon recovery. The Salmon Valley Chamber of Commerce called a meeting to inform people what might happen after the listing. During the meeting, Andy Brunelle, who was Governor Cecil Andrus' natural resource aide, said that the Bonneville Power Administration "likes to make an issue of fish habitat being destroyed by Idaho cowboys and loggers. In my mind, it's nothing more than a cynical power play to keep the focus on fish habitat and off the dams." He said that the hydropower dams are grinding up 95% of the young smolts

migrating to the sea each year (Associated Press 1992*d*); the percentage in the NMFS biological opinion is somewhat lower. From 1986 through 1990, estimates of total mortality for downriver migrants from Lower Granite Dam to below Bonneville Dam ranged between 63 percent and 89 percent for juvenile spring/summer chinook salmon and between 91 percent and 96 percent for juvenile fall chinook salmon (NMFS 1995*b*).

Several ranchers decided after the meeting to devise habitat improvement plans for salmon restoration. A group of ranchers had been working for two years to identify problems on the Lemhi River, and welcomed the suggestion from salmon advocate Ed Chaney to work up their own plan and apply for some of the \$50 million slated for salmon restoration in the Upper Salmon Valley (Associated Press 1992*d*).

In an editorial opinion, a former resident of Salmon (Smith 1993) said the period of heaviest grazing in the Salmon National Forest was in 1924, when the number of Animal Units Months was 80,427. That was halved by 1972, and additional reductions have since occurred. Salmon numbers declined as range livestock numbers declined. Today's grazing is well-managed, in Smith's opinion. However, he said grazing does not help salmon. Nonetheless, he bluntly concluded, "The people who want cattle removed from our public lands want them removed for personal or political reasons" (Smith 1993).

Fenton Roskelley, outdoor writer for the *Spokane Spokesman-Review*, grew up in Challis, Idaho, when the upper Salmon River was "a fisherman's paradise," with big rainbow and bull trout. In the summer of 1993, he reminisced, sadly:

Spawning chinook salmon, which once crowded every shallow graveled spot for more than 100 miles, are now quite rare—the result of dam problems on the Snake and Columbia Rivers. Some steelhead still swim 1,000 miles up the rivers, but they're far from plentiful.

I've believed for many years that trout fishing deteriorated primarily as the result of the operation of a gold dredge on the stream's Yankee Fork.... [T]hese days there are more rafters than fisherman.... few locals fish the Salmon.... [T]he dredge was shut down 42 years ago.... For many years, anglers were

permitted to keep too many trout.

The Salmon is the river of my dreams. . . Maybe I should never have gone back.

On our way home [to Spokane] my wife and I stopped along the Clark Fork River east of St. Regis [Montana]. I rigged up a fly outfit [and hooked two good-sized rainbows in less than two hours]. At least the Clark Fork, despite problems created by miners, loggers and a paper mill, still is a good trout stream. Maybe some day the upper Salmon may harbor thousands of big trout again. (Roskelley 1993).

Salmon, Idaho—"Environmentalists ignited a firestorm in central Idaho by requesting a blanket injunction on all logging, mining and grazing on six national forests to protect endangered salmon habitat" (Stuebner 1995).

In January 1995, 800 jobs were at stake when two major open-pit mines and two mines under construction were scheduled to close. Twenty-eight smaller mines, three timber sales, and 69 grazing allotments in the Salmon and Challis National Forests also "were placed in jeopardy." The state legislator from Challis was "mad as hell." The owner of the sporting goods store in Salmon called the injunction a sham: "There's no way this is going to help make the salmon come back. It makes me feel like an innocent person is being sent to the gallows" (Stuebner 1995).

The Oregon-based Pacific Rivers Council and The Wilderness Society, based in Washington, D.C., pushed for the injunction. Some Idaho-based environmental groups criticized the plaintiffs for pushing the injunction when Congress is leaning toward "gutting" the ESA. Referring to her counterpart with the Pacific Rivers Council, Wendy Wilson, executive director of Idaho Rivers United, said she "screamed at him.... [H]e set me back three years in building organization in support of the ESA in Idaho. I understand why they filed the suit, but their strategy sucked" (Stuebner 1995).

Four days after the stay of the injunction was granted, an estimated 2,500 people marched into Salmon to show the out-of-state groups that people depend on these forests for their livelihood. Craig Gehrke of The Wilderness Society and Bob Doppelt of the Pacific Rivers Council maintained they did the right thing. Gehrke said, "Let's face reality,

we've got an endangered species here, you've got to revise the forest plans and lower those timber targets so you can protect salmon habitat" (Stuebner 1995).

Hadley Roberts, an environmentalist and author of a bird-watching guide, lives in Salmon. He did not think the lawsuit would help. "All they're doing is crossing the t's and dotting the i's. I don't think it will save a single salmon. If those Sierra Club (Legal Defense Fund) attorneys put the same amount of effort into addressing the dams, we'd be a lot better off." Many fish biologists agree (Stuebner 1995).

Pat Ford, executive director of Save Our Wild Salmon and long-time Idaho environmentalist, said he and others now have to work on rebuilding trust with loggers, miners, and ranchers. He said, "This whole episode has caused conservationists big trouble of all kinds. But I still want to go into Challis and Salmon and talk about our goals and objectives and try to find some common ground" (Stuebner 1995).

Before leaving Salmon to see how other places and people in Idaho have been affected by salmon recovery, see Sidebar B-1, featuring a letter to the editor of *High Country News* from a social scientist who has worked in Salmon. Some observers, such as Barker (1993), refer to the ESA as a shield and a sword. Here the sword has been used in the name of saving salmon and has cut deeply into people. Professor Brunson is more blunt—he called this a meat cleaver approach.

**Grazing Permits.** One example of how salmon conservation efforts have impacted public lands grazing is in the Challis National Forest. Grazing permits within salmon habitat areas have been altered to shorten the grazing periods in and adjacent to riparian areas. Also, the Forest Service applied a "100 percent compliance policy" whereby any violations of the restrictions could lead to immediate removal of livestock and termination of the rancher's grazing permit (Feldman 1995).

A second example is in the Stanley Basin, in the Sawtooth National Recreation Area managed by the Forest Service. It illustrates the difficulty of taking a single-factor approach

## Sidebar B-1.

## One-size-fits-all Environmentalism can be Disastrous

Dear *High Country News*,

Last summer I spent several days in Salmon, Idaho, as part of my research on the human dimensions of ecosystem management. I expected to hear the same sort of petulant threat-mongering that Jon Margolis [a Chicago journalist, in *High Country News* (Feb. 20, 1995)] mocked—something I've heard increasingly often in my years of listening to the voices of the rural West.

Instead I found a community where it was still thought proper to be polite to strangers bearing notebooks. Salmon was a working town where mining and logging were honorable occupations, but where folks also were proud of the contribution that river rafting makes to the local economy. It was a place where the Forest Service and BLM were said to be part of the solution as well as part of the problem ... a place where county rights activists talked of "local custom and culture" but insisted that local environmentalists be represented on county land-use committees ... a place where conservative Mormon farmers and ranchers set up a phone tree so they could quickly turn off the irrigation pumps when a salmon or two were seen waiting to head up the Lemhi River to spawn.

I'd hoped to be able to do a follow-up study this summer to try to discover what made Lemhi County different. Why was it still possible in Salmon—but not in Joseph or Kalispell or Republic or Silver City—for there to be civil discourse between people who care equally about the land but want such different things from it?

Now I can forget that idea. Folks in Salmon are polishing their six-guns just like their counterparts across the West—thanks to the Wilderness Society, Pacific Rivers Council, and the Sierra Club Legal Defense Fund lawsuit that would block all grazing, logging and mining on the national forests of central Idaho. I suppose it's easy when you're in an office in Portland or San Francisco to forget that living, breathing people are part of the landscape of the West. It may be easy but it's also disastrous. This sort of one-size-fits-all approach to environmentalism, imposed from outside by people who wield their legal hatchets simply because they know they can, will harm the environmentalist cause just as surely as any dam.

If we lose the Endangered Species Act and other environmental laws in the 104th Congress, it won't be because the bad guys got elected at precisely the wrong time. It'll be because the good guys tried to kill a gnat with a meat cleaver, and in the process managed to slice into their own jugulars.

Mark Brunson  
Logan, Utah

Dr. Brunson is an assistant professor in the Department of Forest Resources at Utah State University and a former Montana journalist.

Source: Brunson (1995).

to natural resource management. There is much more involved here than ESA salmon conservation. In early August 1992, an extended drought coupled with the need to protect listed salmon led the area ranger to order 400 head of cattle out of the Stanley Basin Grazing Allotment (*Idaho Statesman* 1992b). A few weeks later, the Forest Service announced its plans to cut grazing in the 45,000 acre Stanley Basin allotment by two-

thirds, not only because of drought-driven effects on salmon streams but also conflicts between cattle and recreationists. Ranchers developed their own plan that included a deferred rotation system, additional fencing, and total exclusion of cattle from certain sensitive stream areas. The plan called for cattle to eat no more than 30% of streamside forage elsewhere, a stricter standard than Forest Service requirements (Associated Press

1992c).

In February 1993, the Idaho Conservation League (ICL) filed suit against the Forest Service to force the agency to stop all grazing in the Stanley Basin until a plan to protect salmon spawning areas and wildlife habitat along the upper Salmon River in the Sawtooth National Recreation Area is completed. The suit came after more than five years of effort by the ICL to reform grazing practices in the Stanley allotment (Titone 1993a). The Forest Service said the suit was unnecessary because the plan would be completed in April. Mike Medberry, former ICL spokesman, said, "We want more than just words on paper; we want protection on the ground" (Associated Press 1993d). The EIS on grazing was a year late because the Secretary of Agriculture delayed it while the Forest Service considered alternatives devised by the grazing permittees. While they were being reviewed, an interim plan for the 1992 grazing season had been implemented. In December 1992, long after the season was over, the NMFS informed the Forest Service that the interim plan did not adequately protect salmon habitat, contrary to what the Forest Service said (Associated Press 1993a).

When the long-awaited EIS arrived in April 1993, it recommended a 44% cut in numbers of grazing animals, much less severe than the 66% cut earlier recommended. The Forest Service said jobs gained in recreation from improved fisheries will more than make up for the jobs lost to the livestock industry (Associated Press 1993b). A report on the final decision in June 1993 identified sensitive areas where livestock would be banned and other areas where fences would be needed to keep livestock away from riparian areas. The NMFS had not responded to the Forest Service plan's likely impact on listed salmon. Forest Service officials said if they had to wait for the NMFS to respond through the consultation process, ranchers might not have been able to graze on the public land at all in the 1993 season (Associated Press 1993b).

A third example is the Boise National Forest. The NMFS had been cutting their teeth on Idaho public land grazing allotments over in the Bear Valley, northeast of Lowman on Boise National Forest land. The USFS had

monitoring reports that showed the degradation of salmon habitat, poor productivity of the stream, and improvements that were possible (M. Tuttle, review comments). The NMFS approved allotment plans for permittees with several restrictions. The main one was that ranchers had to erect miles of fence to keep cattle out of streams (Garber 1993f). Emmett rancher Jim Little said he can live with the restriction, but at \$3,000 per mile for the three miles of fence, it gets expensive, and makes public land grazing as expensive as a lease on private land. Little said he was worried that after he paid for the fence this year, the NMFS still may decide to take away his grazing permit next year (Garber 1993f).

A fourth example is on the Payette National Forest, where a Council, Idaho rancher said enforcement of the ESA in 1993 to protect salmon habitat took away his water right that dates to the 1920s. The issue was whether the NMFS believed the rancher's 3 cubic feet per second of water drawn from Boulder Creek for irrigated pasture and hay was required for fish habitat. The rancher required a special use permit from the Forest Service for the ditch (McCoy 1993b).

Because of a new Payette National Forest policy to only do a biological assessment on new actions, or renewals, this case would not have been considered because the permit was not up for renewal. The NMFS played a role in 1993. On February 1, the New Meadows Ranger District of the Payette National Forest submitted its biological assessment, and did not receive a response until mid-July, 30 days later than allowed under the ESA (McCoy 1993b).

Perhaps most instructive of all about these consultation cases is a comment made by Al Logosz, chief of biological resources for the Idaho State Office of the Bureau of Land Management. At a public meeting he explained the process all federal agencies must go through to comply with the ESA: "It's a complicated process, and people just don't understand" (McCoy 1993b).

Why is the process so complicated? Can it be streamlined and be effective at protecting species? These are the relevant questions to ask about the ESA. The complexities of the consultation process are further illustrated by



timber sales in the next section, followed by recreation.

**Timber Sales.** The examples in this section are intended to illustrate the complexities of the ESA section 7 consultation process. Examples include the difficulty obtaining permits to use U.S. Forest Service roads to access state and private timberlands, delay of national forest timber sales, and no-harvest streamside protection zones.

**National Forest Road Use Permits.**—Access to state and private timberlands using national forest roads has presented problems. For example, some State of Idaho timberlands managed by the Idaho Department of Lands (IDL) are intermingled with lands in the Nez Perce National Forest. The NMFS has required IDL to consult regarding its use of these roads because of potential impacts on salmon spawning and rearing streams. This has posed substantial delays of more than a year for IDL managers, and the issue still had not been resolved as of September 1995 (W. Wiggins, pers. comm.).

In March 1995, Burton (1995) reported that an IDL sale of 255,000 board feet of timber on Potato Hill near Orofino has been held up by inaction on the part of the NMFS. The sale is an over-story harvest in an area harvested 10 years ago, and no new roads are involved. To access the timber, IDL has requested right of way to use 1.25 miles of existing Forest Service road. The NMFS requires the USFS to assess the effect of the project on chinook salmon, and "Spud Hill" falls within what is called "impactable" habitat for the fish. The USFS biological assessment concluded that this is "not likely to affect" salmon, which is not the same thing as "no affect." IDL requested a ruling from NMFS in August 1994 to clear the way for the proposed sale. In March 1995, after no response from the NMFS, the Land Board directed IDL to contact the congressional delegation for assistance in getting the NMFS to respond. The delay caused by the NMFS is frustrating to the IDL (Burton 1995). In the letter, IDL Director Hamilton (1995) pointed out that the public school endowment Fund of Idaho has lost at least \$30,000 from a significant drop in timber prices due to delay

in the road use permit. Director Hamilton (1995) said, "Our only conclusion therefore, is that this is an effort by the federal agencies to delay or dictate management of Idaho's trust lands." He implicated the U.S. Forest Service for not issuing a "no affect" finding as well as silence from the NMFS when he asked for clarification on the issue from the agency's Portland, Oregon office, first in August 1994 and again in January 1995 (Hamilton 1995). As of August 1995, there had been no response from the USFS or the NMFS to IDL. In September 1995, Director Hamilton and Assistant Director Wiggins met with NMFS personnel, and it was clear to the IDL executives that the NMFS personnel had not read the documentation regarding the situation (W. Wiggins, pers. comm.).

The Forest Service side of the story regarding consultation on the road use permit is contained in a December 22, 1994 letter from Nez Perce National Forest supervisor Mike King to the NMFS office in Portland requesting an update of the status of this and another similar consultation. The NMFS replied on January 25, 1995 that consultations at the watershed or individual project level were lower priority than consultations on PACFISH and the Land and Resource Management Plans (copies of letters in Policy Analysis Group file).

**"Jeopardy" Consultation Delay.**—In January 1993, Senator Larry Craig (R-Idaho) said national forest timber sales, as well as hundreds of ranchers, outfitters, and recreationists, were being inconvenienced because of bureaucratic red tape by the NMFS. He said the agency is unable to make quick decisions about whether certain activities could harm salmon spawning grounds. That puts many forest uses on hold until a decision is made, Senator Craig said. A spokesman for the NMFS denied the charge (Garber 1993g, see also Garber 1993a, Harriman 1993a).

In July 1993, 100 Elk City timber workers lost their jobs. Their employer blamed the job cuts on federal agency efforts to protect salmon runs. On a grander scale, sales from four national forests in Idaho—the Nez Perce, Clearwater, Payette, and Boise—that contain critical habitat for salmon feed roughly 75% of Idaho's sawmills, according to Joe Hinson,

executive vice president of the Intermountain Forest Industry Association (Massey 1993b). "Jobs in those forests are probably in the neighborhood of 10,000," said Hinson. "Unless they resolve this situation, we can expect the same uncertainty, perhaps some additional layoffs" (Massey 1993b). Given Hinson's stated assumptions, that number of jobs is accurate based on total employment in the lumber and wood products sector in Idaho. However, it is hyperbole to say all these jobs would be lost due to salmon conservation, unless all the mills relied totally on national forest timber and salmon concerns were the only reason the timber sales were terminated, neither of which is the case. According to Haminishi et al. (1995), endangered species concerns are the major reason for anticipated declines in national forest timber sales, but there are many other reasons, too.

In some cases, dead or dying timber damaged by fire is losing market value as the Forest Service and the NMFS ponder how best to protect the Salmon River. Scorched timber along the Salmon River became part of the debate about salvage logging and protecting salmon, and illustrates the complexities of the ESA consultation process. Several mills rely on federal timber in north central Idaho. Harvest from the delayed Scott Salvage sale (see Sidebar B-2) alone would keep an entire sawmill shift busy for one year (Massey 1993a). This highly publicized sale eventually went through the consultation process, but because helicopters were unavailable and the appraised value was said to be too high, no Idaho company bid on it, and it was sold to an Oregon outfit (Loftus 1993b).

NMFS spokesman Merritt Tuttle (review comments) stated that NMFS responded to the Scott Salvage sale consultation in a timely manner. He wrote, "From the time we received the complete submittal from the USFS, until the conclusion of our informal consultation, it took only 5 business days.... The sale quickly went through the process."

By way of illustration, what is not yet evident here are the lengthy and involved consultation procedures the national forests must follow in the preparation of the biological assessment (or biological evaluation as the USFS refers to it) submitted to the NMFS,

which can keep cycling back to the USFS until the NMFS is satisfied with the information in it. After that the NMFS will have what Tuttle called a "complete submittal" and can make a "jeopardy" determination. Harriman (1993b) erroneously reported that this occurred on the Scott Salvage because the NMFS did not accept the Forest Service's logging proposal, and required an analysis of the entire Salmon River drainage. Actually, the Nez Perce National Forest was asked to prepare a limited cumulative effects assessment for a small group of Salmon River tributaries affected by the proposed timber sale, along with a risk assessment for several alternative routes for hauling helicopter fuel (P. Jahn, review comments).

The purpose of these examples is not to point the finger at one federal agency or the other, but at the requirements of the formal consultation process of the ESA itself that leads to delay. All of these problems, it seems, could be overcome by cooperation, and some guidelines as to what constitutes "jeopardy."

In November 1993, Titone (1993b) reported that forest products industry officials vented their frustration at the "slow and needless burden" of federal review of timber sales to protect Snake River salmon. The forum was a roundtable discussion about the NMFS reviews arranged by Senator Dirk Kempthorne (R-Idaho). Richard Bennett, owner of the Elk City sawmill, talked about livelihoods put in danger by the slow consultation process. His mill depends heavily on trees from the Nez Perce National Forest. He said, "We aren't likely to have a timber sale program for three years while this is being re-evaluated. Meanwhile, no one has been able to show me that we've done anything that killed a salmon yet" (Titone 1993b).

**No-harvest Streamside Protection Zones.**—Salmon conservation under the ESA and PACFISH has and will continue to have an influence on timber harvest in Idaho. The NMFS has adopted PACFISH standards for endangered Snake River salmon runs. PACFISH prohibits logging within 300 feet on either side of fish-bearing streams in salmon critical habitat. The rationale for 300-foot buffer zones is covered in the

## Sidebar B-2.

## Delay of the Scott Salvage Sale on the Salmon River

The controversial Scott Salvage sale along the banks of the Salmon River above Riggins typifies how efforts to protect salmon from extinction have slowed some public timber sale programs.

About 14.2 million board feet of timber that burned in a fire last summer has been slated for sale since early spring. But the sale has not occurred, because the U.S. Forest Service and the National Marine Fisheries Service are studying possible impacts on salmon habitat.

To prevent environmental damage, only dead trees would be logged from the Scott sale area in the Nez Perce National Forest. And even some large dead trees would be left for woodpecker habitat. To prevent soil erosion, nearly all logging would be done by helicopter.

The Forest Service says there are only two long-shot possibilities that could damage salmon runs during harvesting. Trucks hauling fuel to helicopter could spill fuel that would seep into the Snake River. Or, soil erosion from logging could dump sediment into the river.

A plan for protecting the salmon habitat was forwarded to National Marine Fisheries last week. But the agency—charged with overseeing the Endangered Species Act as it relates to salmon—still needs more information from the Forest Service.

"The Scott fire sale is going to be mitigated to the point where it has a very, very low possibility of effecting habitat," said Phillip Jahn, staff officer for fish, wildlife and ecosystems in the Nez Perce National Forest.

The forest would have offered much more timber for sale if it weren't for delays in consulting with National Marine Fisheries regarding the salmon, said Dick Artley, timber program leader.

Jahn said he understands industry's frustration. Major losses of salmon are attributed to hydroelectric dams on the Snake River, and substantial numbers of the fish are caught by commercial fisherman. Yet those known hazards are allowed to continue while logging, arguably a less serious threat to the salmon, is curtailed.

"They (mill workers) just don't see the problems here in this area as being so severe that they need to lose their jobs in order to recover the fish," he said.

However, Artley said, mills have some 160 million board feet under contract in the Nez Perce National Forest. That's timber, already purchased and available for logging at the mills' discretion.

"We're not holding anything up," said Merritt Tuttle, division chief in charge of the Fisheries Service's Portland office. "We are going to move on this as fast as we can."

Even environmentalists who regularly criticize the timber industry concede the government is bungling the Scott sale.

Some timber sales could harm salmon habitat, but the Scott sale is not an example of one, said Dennis Baird of the Idaho Environmental Council. "They should have expedited this one."

Source: Massey (1993a,b).

### ***FEMAT/PACFISH Riparian Protection*** section later in this case study.

The intent of these PACFISH protection zones is to make ESA consultation easier, and to keep sediment out of streams. Sediment can cover spawning grounds needed by salmon to lay eggs, causing spawning gravel to become embedded and limiting spawning habitat. Sediment can also smother eggs by robbing them of oxygen. An example happened in the 1960s when a road alongside the South Fork

of the Salmon River slumped into the river. Thirty years later, the river has still not completely recovered in spite of a logging moratorium in the drainage (M. Tuttle, review comments).

At a meeting of the Western Legislative Forestry Task Force held in Lewiston in September 1993, Deputy Regional Forester Bob Joslin addressed state legislators from Idaho, California, Oregon, Washington, Alaska, and the Canadian provinces of British

Columbia and Alberta about PACFISH regulations. He told them almost everything, including logging, mining, and grazing will be affected, as well as camping and anything else along salmon streams. State Senator Tim Leslie of California said the new standards should get a public review before they are put in place (Loftus 1993a).

In early 1994, the Forest Service and BLM jointly released the first public document on PACFISH. The environmental analysis requested public comment before May 1994. In the meanwhile, the NMFS used PACFISH standards in the consultation process. Forest Service timber sale activities have been modified according to PACFISH interim management standards. On a regional scale, the PACFISH (1995) environmental assessment indicated that the new management standards might result in a reduction of timber yields by 58 million board feet under the Forest Service' preferred alternative, or about 5% of the allowable sale quantity of timber in the forest plans. In March 1995, the Forest Service and BLM adopted the PACFISH standards they developed (*Public Lands News* 1995b).

**Recreational Fisheries.** In December 1992, the NMFS announced that it wanted to reintroduce sockeye salmon into four lakes near Stanley, Idaho. Merritt Tuttle, NMFS spokesperson, said that may require "eliminating predatory trout." He said if hatchery-raised trout are released into the lakes and eat the salmon fry, "there's a chance trout fishing may need to be curtailed" (Associated Press 1992b).

According to Trish Klahr, formerly of the Idaho Conservation League and now a biologist with the FWS in Boise, the sockeye reintroduction project failed to address the real problem—the hydroelectric dams blocking the migratory path of salmon to and from the ocean. She said, "It's a classic example of where downstream electric interests have twisted this issue to make rainbow trout part of the problem. Rainbow trout is not the issue. There have been rainbow trout planted in Redfish Lake for decades and the sockeye have barely been coming back, but they've been there" (Associated Press 1992b).

The issue is not just rainbow trout raised and planted for Idaho recreation opportunities. Ocean-going rainbows, or steelhead, are also viewed by the NMFS as part of the problem. Landers (1993) reported that a federal permit requirement could delay the scheduled release of millions of hatchery steelhead in the spring of 1993. For the first time, state and federal fisheries agencies in Idaho, Oregon, and Washington were required to obtain federal permits under the ESA before they could release hatchery-raised steelhead and salmon into the Snake and Columbia Rivers. Oregon had to delay releases of about 5 million salmon because the NMFS had not given them approval (Landers 1993).

John Kerwin, hatchery program manager for the Washington Wildlife Department, explained the problem. "These fish have already been [genetically] programmed for the time they must be released. Their biological clocks are ticking, regardless of what we do. If they get too big in the hatcheries, we'll have poor smolt-to-adult survival rates. If held beyond their release time, they tend to want to stay in the rivers, rather than migrate out to sea" (Landers 1993).

The Washington Wildlife Department applied for its permit to release 3.8 million steelhead in December 1992, but the report wasn't even listed in the *Federal Register* until early March, when a mandatory 30-day comment period required by the ESA kicked in. Kerwin said, "Our concern isn't so much whether the permit will be forthcoming, but whether they'll be issued in a timely fashion" (Landers 1993).

The same delay occurred in Idaho, when a planned release of 400,000 steelhead smolts was delayed by the NMFS. These actions have brought a new recognition that the ESA affects hatchery operations as well as hydropower, harvest, and habitat (Harriman 1993a).

In late May 1993, the NMFS issued a 5-year ban on all recreational fishing in Idaho's Redfish Lake in order to protect sockeye salmon. Ninety minutes after publicly issuing the ban, the NMFS reversed its decision. The ban upset operators of the Redfish Lake Lodge because they were preparing for the annual influx of Memorial Day weekend lodgers and

campers. A ban on fishing could have cut boarding at the lodge by 35 percent (Etlinger 1993a).

Although the NMFS lifted the recreational fishing ban before Memorial Day, the agency took its time issuing permits for stocking trout in Redfish Lake and surrounding lakes and streams (Etlinger 1993a). The Associated Press (1993i) reported that merchants in the Stanley area blamed a drop in early season trade on the ESA as well as inclement weather. Catchable trout are usually stocked in area lakes in late May, and by July 4 in area streams. Held up by the NMFS permit, stocked trout were not released until July 16. Chinook salmon fishing was once a recreational mainstay but was stopped in 1974 because of dwindling numbers of fish. Since then, Stanley has depended on rainbow trout fishing to keep recreation-related businesses afloat. The town has stopped pointing fingers and is looking for solutions. Redfish Lake Lodge operator Jack See said his business was down about 16 percent because of postponed stocking. "I hope we can rally together and tackle this issue before it begins to destroy us," he said (Associated Press 1993i).

In October 1993, the team of seven scientists contracted by the NMFS to develop a recovery plan released their 400-page draft. A small item angered anglers in Idaho—a proposal to limit recreational trout fishing in salmon-bearing streams and lakes by eliminating the stocking of rainbow trout in Stanley Basin lakes and the Salmon, Clearwater, and lower Snake Rivers. The reason given was that hatchery trout eat baby salmon (Garber and Zimowsky 1993; see also Snake River Salmon Recovery Team 1993, p. X-18).

Idaho Department of Fish and Game officials disagreed, and said hatchery-raised trout are lousy predators and don't pose a threat to salmon (Garber and Zimowsky 1993). Governor Cecil Andrus and environmentalists said the proposal shows how the federal government has become bogged down in irrelevant details instead of taking important steps to save salmon. Salmon advocate Ed Chaney said, "Stocking streams with trout has nothing to do with recovery of the salmon. All (the recovery team's) recommendation will

do is hurt local business. It won't help the salmon" (Garber and Zimowsky 1993).

According to the Idaho Department of Fish and Game, if trout were no longer stocked in the Stanley Basin and along the main stem of the Salmon River, the local economy would lose \$1.1 million annually from the 17,000 anglers who usually fish in the area (Garber and Zimowsky 1993).

The NMFS proposed recovery plan does not specifically mention stocking of trout, but recommended "major reductions in non-native species *within the area inhabited by the listed species*" (NMFS 1995b, p. V-2-77, emphasis in original). This would not seem to favor stocked rainbow trout for recreational purposes in the Stanley Basin.

**River Rafting.** The listing of Snake River salmon has resulted in a variety of constraints imposed on whitewater boating on the upper Salmon River within the Sawtooth National Recreation Area. In the summer of 1992, the first following the listing of Snake River chinook salmon, four outfitters with commercial permits on the upper Salmon River voluntarily agreed to cut down the number of raft trips in July and August, the peak of their season. They reasoned it was better to act voluntarily than to be ordered to do so by a federal agency (Associated Press 1992a).

Rafting can to some extent disturb spawning activities of some fish. Jill Dufour, a USFS biologist, camped along the upper Salmon River over Labor Day weekend in 1992 to observe the effect of rafting on spawning salmon. Red buoys marked the spawning beds, making it easy for boaters to find a route avoiding the beds and redds, which are salmon nests in shallow gravel bars. Dufour observed 442 total events of boats passing by. In 69 instances, fish swam off the redd; they returned to the redd in 65 of those events. Four times (less than 1% of the observations) the fish did not return to the redd (Associated Press 1993f).

In 1994, activities were restricted at certain times in an attempt to avoid disturbing spawning chinook salmon or their redds (see Figure B-1). In early August, extreme low water conditions on the upper Salmon River prompted the NMFS to announce closure of an

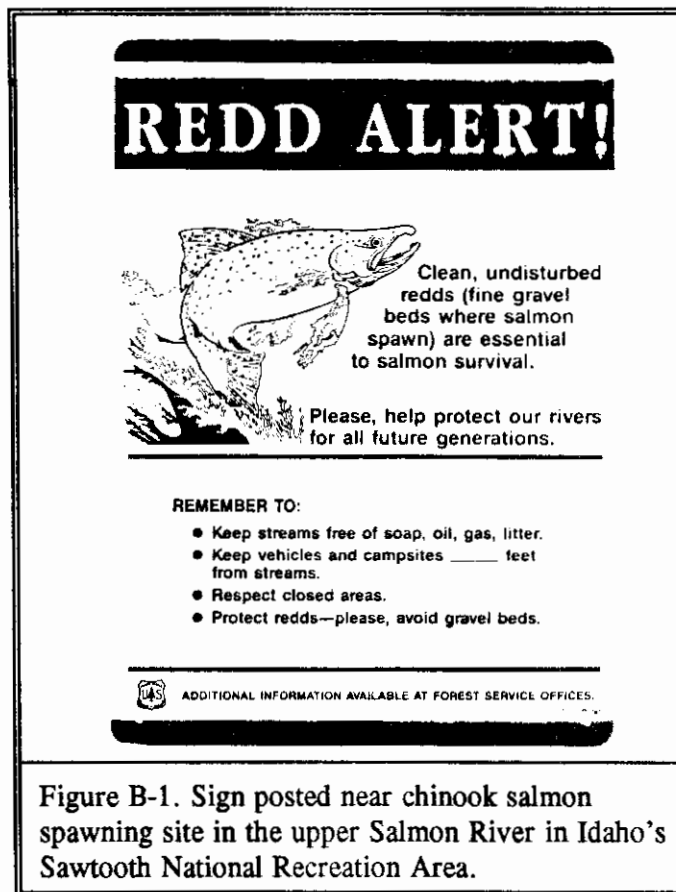


Figure B-1. Sign posted near chinook salmon spawning site in the upper Salmon River in Idaho's Sawtooth National Recreation Area.

8-mile stretch of the river to float trips. Outfitters protested to their elected congressional representatives and meetings were set up, resulting in compromise restrictions limiting the time of day floaters could move through the stretch. Government officials said floating would be banned if three incidents of salmon abandoning redds were reported, and agents would be monitoring compliance. They noted about 15,000 people have floated the area in recent years (Associated Press 1994b). When the summer chinook salmon run returned to the river in August 1994, boaters were required to portage 300 yards around the active spawning redds (Feldman 1995).

Merritt Tuttle (review comments) of the NMFS wrote that there is much more to this than was reported in the press:

I flew to Stanley on August 4, 1994, for a public hearing and to work with the outfitters. My goal was to find a satisfactory way to protect the salmon and to accommodate the needs of the

outfitters. Most outfitters volunteered to portage around salmon redds because they realized that the extremely low flows would place the boats and the redds in the only remaining strip of floatable water. The oral information that I received indicated that very few salmon returned to spawn and that the outfitters finally had to quit floating because of lack of sufficient water. (M. Tuttle, review comments).

The compromise restrictions prompted some newspaper editorials to criticize outfitters for forcing the compromise. Doug Tims (1994), past president of the Idaho Outfitters and Guides Association, responded that the outfitting industry had been working since 1989 to assure that salmon spawning activity was not hampered. The mitigation plan agreement forged in August 1994 was in response to a decision by the NMFS that, according to Tims, the industry, conservationists, and elected officials thought was unreasonable. As Tims put it, "Idaho's rural economy was going to take a big hit—for

no reason. If or when the salmon return and spawn in this historic low-, warm-water year, outfitters will halt operations if objective scientific evidence demonstrates a need to do so to protect the fish." But as Bjornn (review comments) pointed out, the ESA works the other way around. It is not up to the Service to demonstrate that the operator is causing "jeopardy," rather it is up to the operator to convince the Service that the proposed action will not cause "jeopardy." Feldman (review comments) clarified the situation: Under section 7 of the ESA, the NMFS is obliged to make its "jeopardy" determination which must be supported by the administrative record. If insufficient information exists, the agency is required to give the benefit of the doubt to the species or to indicate that it has insufficient information to make a determination that the action is not likely to "jeopardize" the species.

Tims (1994) continued, "We hoped our model might become a model for industry, demonstrating you can live and work around endangered species and the Act, even if we do sacrifice financially. What we may be learning is that, despite best efforts, you can't. The ESA may be too strict and too complex to allow even the most caring, informed users and managers to implement it. The jury is still out. The case may well be discussed again when the ESA's reauthorization is addressed in Congress" (Tims 1994).

The 1994 restrictions cost four outfitters between \$125,000 and \$250,000 in revenue (Associated Press 1995c). Outfitters feared their business would be further hurt by a petition being circulated in central Idaho to add rafting trips to Judge Ezra's injunction (now lifted) against forest activities. Citizens wanted to know why recreation was excluded from the list of logging, mining, and grazing activities that were to cease on six national forests. Craig Gehrke of the Wilderness Society said recreation was omitted from the *Pacific Rivers* lawsuit because, "problems associated with recreation are not as hard to solve as those created by actual land disturbance. You can control them a lot more easily than you can sediment weeping from a road into a watershed" (Associated Press 1995c).

## Interagency Cooperation Lessons

There are two areas where the NMFS can affect other agencies and private landowners. One is interagency consultation under ESA section 7 to avoid jeopardy or adverse modification of critical habitat. The other is acquiring an "incidental take" permit to avoid an ESA section 9 take, and this is available if there is a federal connection to state and private activities.

**Interagency Consultation (ESA § 7).** The NMFS has to meet certain requirements during the ESA consultation process, and will undoubtedly become more efficient at it as time goes on. The power the Service wields is considerable, and it would benefit those affected by decisions made during the consultation process to participate in it rather than sit back and wait.

Feldman (1995) said that although national forest timber sales may provide only limited opportunity for purchasers to participate in consultation, other development projects—including grazing, mining, water development, and recreational development—may provide substantive opportunities for private entities to participate in the consultation process as part of the project applicant's general planning and permitting efforts.

Four steps were suggested by Feldman (1995) for project applicants or proponents, with much more detail than can be provided here:

1. Be involved in the consultation process.
2. Provide good environmental data to the consulting agencies.
3. Identify an advocate for the project within the consulting agencies.
4. Monitor ESA listing petitions and actions. (Feldman 1995)

Tuttle noted (review comments) that "incomplete or poor data is the primary cause for prolonging the consultation process. Whenever NMFS has to request further information or clarification the process becomes slower. In addition, more thought on how to avoid harm to salmon would yield faster consultations, with less problems (if any) to address."

Particularly important may be comments on programmatic agency responses to ESA issues, such as the development of a region-wide environmental impact statement for ecosystem management in the Upper Columbia River Basin (Feldman 1995).

Recent policy directives may lead to more expedient consultations in the future. The Service must identify, to the extent known at the time a species is listed, those activities that will and will not result in a take (59 *Fed. Reg.* 34272 [July 1, 1994]). Service biologists are now required to review and evaluate information from other agencies, groups and individuals as part of the consultation process (59 *Fed. Reg.* 34271 [July 1, 1994]). The Service is also required to incorporate ecosystem considerations in ESA actions (59 *Fed. Reg.* 34273 [July 1, 1994]), which may make the Service more responsive to the current ecosystem management direction in the USFS and BLM. Also, the recently proposed alternative consultation process for USFS and BLM activities (60 *Fed. Reg.* 39921 [Aug. 4, 1995]) may make program-level and project-level consultation decisions more timely and more responsive to the needs of the resources.

**"Incidental Take" Permit.** For listed salmon, the NMFS is in charge, and has ruled that the ESA § 9 take prohibition applies to threatened salmon as well as endangered salmon stocks. Idaho law also prohibits the take and possession of all threatened and endangered species. Essentially all management and research activities for listed salmon and other fish species that live where salmon do fall under the definition of take. Therefore, activities directed at listed salmon, such as snorkel monitoring of juvenile salmon or annual counts of salmon redds (nests) have also been defined by the NMFS as forms of take. IDFG is a conservation agency, with similar goals and objectives as stated under the ESA. However the agency is required to be authorized by the NMFS to perform their mandated duties to "preserve, protect and perpetuate" fish and wildlife resources (*Idaho Code* Title 36). The ESA requires the NMFS to determine that proposed actions with a federal connection are not likely to jeopardize the continued existence or recovery of listed

salmon. This is a goal IDFG shares with NMFS; however, getting authorization for the IDFG activities is a lengthy and convoluted business that has thrust IDFG fish biologists into a frustrating legal maze (Kiefer 1993).

What follows is a basic primer of the ESA take permitting process (from Kiefer 1993):

- Incidental take means that limited taking is allowed if it is incidental to the purpose of the project, and effort is made to minimize and mitigate the taking.
- Federal nexus: If a take is "incidental" and there is a federal connection, a section 7 consultation occurs. The action agency (IDFG) prepares a Biological Assessment (BA) and submits it to the federal agency connected to the action. This is often the FWS. That federal agency then consults with NMFS. The end product is a Biological Opinion of whether the species is or is not "jeopardized" by the take. If the take poses no "jeopardy," NMFS issues an incidental-take statement. Most incidental take activities have federal connection through funding or permitting, so they go through the consultation process.
- No federal nexus: If the take is incidental and there is no federal connection, the action agency (IDFG) applies for a section 10 "incidental take" permit. This permit is supposed to be the corollary to the consultation process. The permit application must be written according to specific federal regulations. It must specify the level of take expected and it must include a conservation plan. The conservation plan identifies actions to minimize and monitor the take of listed species or their habitat. Each permit application requires a 30-day public notice in the *Federal Register*.
- If the take is direct, the action agency (IDFG) applies for a section 10 direct-take permit. Any direct take of a listed species must be aimed at scientific research and enhancement of the listed species. The application outline is 5 pages long with 35 segments. This permit also requires a 30-day public notice in the *Federal Register*. (Kiefer 1993).

Since December 1992, the IDFG has applied for 3 incidental- and 6 direct-take permits and has been involved in five federal consultations. These processes are lengthy, generally taking 60-120 days, and do not allow the needed daily information and in-season adjustments that IDFG fish management relies on. The current incidental take permit process



does not meet the needs for management flexibility. An ESA section 6 agreement with the NMFS could provide more opportunity for flexibility (Kiefer 1993).

***Should the NMFS be In Charge?*** When the Snake River Salmon Recovery Team of seven independent scientists released its draft and final recommendations in February and April 1994, respectively, the team leader, Professor Donald Bevan, said, "Our biggest surprise in going down to the river was to find no one was in charge. That is true today. Someone has to be in charge" (Sonner 1994). Asked if he believes the NMFS is capable of leading the recovery effort, Bevan said no. The agency needs more money and more good people where they aren't now (Loftus 1994b). Why should NMFS have habitat management responsibilities in the Inland West?

Idaho is quite a distance from the "marine" environment, and when salmon are in Idaho they have adapted to freshwater, except for the migratory urge of juveniles to leave the state. NMFS has the assignment to implement the ESA throughout the range of salmon habitat. Inland, in fresh water, salmon requirements are similar to resident salmonids (i.e., trout), except their genes urge them to spend part of their life in the ocean.

If the FWS is capable of handling habitat issues with the dam and water flow situation with the Kootenai River white sturgeon and upper Colorado River fishes, as well as listed Lahontan cutthroat trout and other resident trout in the West, there is every reason to believe the FWS is capable of dealing with the full range of salmon issues while the fish are in the freshwater portion of their lifecycle. Having NMFS implement the ESA in Idaho inefficiently duplicates bureaucratic structure as well as the efforts of the FWS to conserve listed freshwater fish stocks. Perhaps the FWS should be in charge of salmon conservation in Idaho.

One suggestion for speeding up consultation was to create a NMFS field office in Idaho so reviews can be done in Idaho instead of in Portland, Oregon (Titone 1993c). The NMFS opened an office in Boise in 1994. Delmar Vail, former Idaho state director of the BLM, said it would help if NMFS biological opinions

(required following an ESA section 7 "jeopardy" finding during consultation) did not need to get approval in Washington, D.C. By contrast, the FWS relies on regional approval for section 7 consultations. Vail said it was NMFS officials in the national capital who overruled regional staff in 1993 and determined that hydropower dams did not "jeopardize" the salmon (Titone 1993c).

Another idea was to give the Forest Service and BLM biologists the authority to determine if activities would hurt spawning streams. However, as Nez Perce National Forest supervisor Mike King said, some people would criticize this as "putting the fox in charge of the hen house" (Titone 1993c).

As mentioned in the preceding section, an agreement under ESA section 6 would establish that IDFG management programs are acceptable for the conservation of endangered and threatened species. The IDFG has such an agreement with the FWS, which is in charge of managing all listed species in Idaho, except salmon. A similar ESA section 6 agreement with the NMFS would give the state access to funding for ESA implementation and recovery and would focus on the ESA's objectives—conservation and recovery actions for listed salmon—rather than permit paperwork (Kiefer 1993). Perhaps rather than changing NMFS operating procedures and negotiating new agreements, the people and imperiled salmon in Idaho would be better served if the FWS, rather than the NMFS, had responsibility for the fresh water portions of salmon habitat.

### **Critical Habitat Designation**

The four runs of Snake River salmon protected as endangered species under the ESA had critical habitat designated by the NMFS in December 1993. The designated critical habitat includes the river reaches of the Columbia, Snake, and Salmon Rivers, and all tributaries of the Snake and Salmon Rivers presently or historically accessible to the fish except for areas above impassable natural falls and the river reaches above Hells Canyon and Dworshak dams in Idaho. This includes the Clearwater River upstream to Lolo Creek. The designation states that timber harvesting,

mining, road construction, livestock grazing, and land management activities in general may require special management considerations to ensure that the essential features of the designated critical habitat are maintained or restored for listed Snake River salmon spawning. Riparian areas are important in the designation.

Riparian areas, broadly defined as lands associated with or affected by water sources, are a small but vital component of western landscapes. These areas link upland and aquatic habitats and provide a number of important resource values, including fish and wildlife habitat. Other resource values associated with riparian areas include water purification, water storage and recharge, forage and water for livestock, and recreation. In addition to providing wildlife habitat, the streamside vegetation in riparian areas protects water quality and fish habitat by providing shade, producing large and small organic debris, regulating sediment and nutrient flows, and stabilizing streambanks (O'Laughlin and Belt 1995).

Riparian areas can be degraded by many land uses, including improper livestock grazing, timber harvest, road construction, mining, and recreational use. However, the proximity of abundant water supplies and the natural resilience of riparian areas often allow rapid recovery response to improved management practices (Johnson et al. 1990).

Concerns about riparian use and management, especially on public lands, have increased dramatically in recent years. The Idaho Wildlife Congress, held in November 1988, provides an example. From two days of discussion groups held in Boise, 37 wildlife-related issues emerged and were ranked. Two of the top three issues dealt specifically with riparian areas: "Improved management of riparian habitats" and "Minimize grazing impacts, especially to riparian areas." (Johnson et al. 1990)

This section highlights the critical importance of riparian area protection for cold water fish conservation, and analyzes the PACFISH rationale for the 300-foot riparian protection zone as critical habitat for listed salmon. It should be noted that PACFISH is an interim step lasting only 18 months, until

more site-specific guidance is available (M. Tuttle, review comments).

***Riparian Areas as Wildlife Habitat.*** Wildlife dependency and diversity peak at the terrestrial/aquatic boundary; i.e., in riparian areas and wetlands. Wildlife have a disproportionately high use of riparian zones. Brown (1985) reported that 359 of 414 (87%) wildlife species in western Oregon and Washington use riparian zones or wetlands during some season or part of their life cycle. He also stated that riparian zones provide more niches than any other type of habitat (FEMAT 1993).

At least 1,098 terrestrial species (not counting arthropods) have been identified as closely associated with late-successional ("old-growth") forests on federal lands west of the Cascade Mountains (FEMAT 1993). Approximately half of these (527) were fungi. Of the remaining 571 species, 196 of them (or 37%) utilized streams, wetlands, and riparian areas. This included all 38 species of birds, all 26 species of mammals (including 11 bats), 13 of 18 amphibians, 57 of 102 mollusks, 29 of 124 vascular plants, 21 of 106 bryophytes (mosses), and 12 of 157 lichens (FEMAT 1993).

Buffer strip requirements in state forest practices acts are designed to protect aquatic habitat and do not specifically provide for terrestrial wildlife habitat protection. FEMAT (1993) recognized the importance of protecting terrestrial wildlife needs, citing a study indicating buffer strip widths from 100 to 600 feet were needed, depending on species and habitat usage. This study referred to two ESA-protected species in the State of Washington; buffer widths of 600+ feet on each bank were suggested for bald eagles, and 200 feet for Columbia white-tailed deer.

***Riparian Area Protection Policy.*** Riparian area protection is a major feature of state forest practices acts in Idaho, Washington, Oregon, and California. The vehicle for protection is a buffer strip, defined as riparian lands maintained immediately adjacent to streams or lakes to protect water quality, fish habitat, and other aquatic habitat resources. Under these laws, the minimum width for

buffer strips adjacent to fish-bearing streams ranges from 25 to 200 feet, depending upon stream features and individual state policies. Idaho requires minimum-width 75-foot Stream Protection Zones on each side of a fish-bearing stream ("Class I") and 5 feet on other streams ("Class II"). Almost all forest practices are permitted within the buffer strip, but a specified number of trees must be left, and a specified amount of stream shading must be provided (Belt et al. 1992, Belt and O'Laughlin 1994). The Idaho State Board of Land Commissioners in 1995 approved wider buffers on Class II streams, and pending approval by the Idaho legislature in 1996, minimum width zones for non-fish bearing streams will increase to 30 feet, except where they do not influence Class I streams (W. Wiggins, pers. comm.).

Best management practices (BMPs), including buffer strips, are effective in protecting water quality. The Silvicultural Nonpoint Source Task Force audited 32 forest practices in Idaho during the fall of 1992. The audit team's task was to inspect the level of compliance and judge whether the best management practices were effective in preventing pollutant delivery to streams. Best management practices were implemented in the majority of cases, or 92% of the time they should have been. When best management practices were applied, they were judged to effectively prevent pollutant delivery to streams 99% of the time. When not applied, pollutants, primarily sediment, were observed in streams three out of four times (IDEQ 1993). Although the visual inspection techniques used by the audit team to evaluate BMP compliance and effectiveness are qualitative rather than quantitative, due to natural ranges of variability as well as measurement problems, establishing quantitative sediment standards and a scientifically valid monitoring program is a difficult and "extremely expensive" undertaking (SAF 1995). A Society of American Foresters task force recommended evaluation and improvement of BMPs to meet water quality standards as an effective way to attain desired water quality, in part because noncompliance with BMPs is easy to detect (SAF 1995).

Recent forestry BMP audits in Montana produced similar results. In 1994, interdisciplinary teams visited 46 sites and assessed up to 55 BMPs. The results showed that the overall application rate of BMPs had risen from 78 percent in 1990 to 91 percent in 1994. Application of "high risks" BMPs, which have a major influence over water quality, have risen from 53 percent in 1990 to 79 percent in 1994. Adequate protection was provided by 93 percent of all BMPs and 83 percent of the high risk BMPs (Montana Forestry Division 1994, in NCASI 1995).

#### ***FEMAT/PACFISH Riparian Protection.***

Streamside protection zones under the Idaho Forest Practices Act are aimed at protecting "water quality and aquatic habitat" (Idaho Admin. Code, IDAPA 20.02.01.030.07). Aquatic habitat is only the part of riparian habitat that occurs in the water. Riparian habitat also includes the terrestrial areas adjacent to the water. The FEMAT and PACFISH goals include protecting riparian and aquatic habitat and contributing to the viability of riparian-dependent plant and animal communities. The goals of FEMAT and PACFISH are therefore much broader than those of the state forest practices.

PACFISH (1994) now applies to eastern Oregon and Washington, Idaho, and portions of northern California. FEMAT—an acronym for Forest Ecosystem Management Assessment Team—followed President Clinton's Forest Conference of April 1993 in Portland, Oregon, and applies to federal spotted owl forests in western Oregon and Washington and portions of northern California. FEMAT (1993) modified the PACFISH regional framework first developed by the USFS and BLM in 1991 in favor of "watershed-specific objectives to accommodate natural variability along the stream network." This rationale is not evident in current prescriptions, and variable prescriptions are postponed until a process called Watershed Analysis (see PACFISH 1994, p. C-18) can be implemented. FEMAT's buffer strip prescription for fish-bearing streams is two site-potential trees or 300 feet from the edge of the flood plain, whichever is greater. PACFISH (1995) simply requires the 300-foot prescription, and no

forest practices are permitted in the buffer strips until Watershed Analysis is completed. No functional explanation for the 300-foot buffer is provided in FEMAT (1993). PACFISH (1995) recognized that the effectiveness of these buffer strips—called riparian habitat conservation areas—in influencing sediment delivery from non-channelized flow is highly variable, and stated that

A review by Belt et al. (1992) of studies in Idaho and elsewhere concluded that non-channelized sediment flow rarely travels more than 300 feet and that 200-300 foot riparian "filter strips" are generally effective at protecting streams from sediment from non-channelized flow. (PACFISH 1995, p. C-7).

In their review of scientific literature, Belt et al. (1992) made several observations about buffer strip design to trap sediment:

- 1) buffer strips should be wider where slopes are steep,
- 2) riparian buffers are not effective in controlling channelized flows originating outside the buffer,
- 3) sediment can move overland as far as 300 feet through a buffer in a worst case scenario. (Belt et al. 1992, p. 3).

The FEMAT/PACFISH approach eliminates forest resource manager's judgments about the size of buffers needed to protect riparian areas and has been criticized as a "one-size-fits-all" design. However, these are interim prescriptions under both FEMAT and PACFISH, pending the outcome of the Watershed Analysis process for determining site-specific buffer strip prescriptions that may be either more or less restrictive than interim prescriptions. Following Watershed Analysis, forest practices may be allowed within the buffer strip to achieve riparian management objectives. The question of whether and when Watershed Analysis will be implemented is problematic (O'Laughlin and Belt 1995; see the *Watershed Analysis* section in the bull trout case example in Appendix C).

The FEMAT approach begins with functional rationales and converts them to buffer strip widths based on site-potential tree height, defined by FEMAT as a tree that has attained the average maximum height possible given site conditions where it occurs. A site-

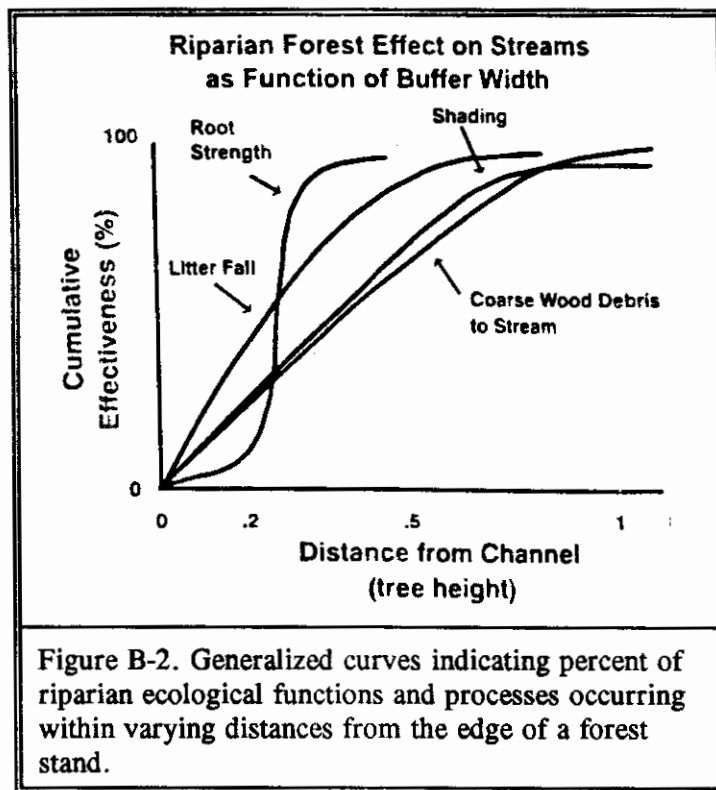
potential tree would average 150 feet in forests west of the Cascade Mountains ("westside" forests) and 100 feet in eastside forests of the Inland Northwest.

As stated by FEMAT (1993), many effects of riparian vegetation decrease with increasing distance from the streambank. Riparian processes may be described as a function of distance from stream channels. Four such functions are illustrated in Figure B-2, which indicates that one tree height distance from the stream channel provides close to 100% cumulative effectiveness for these functions. Thus, FEMAT recognized that buffer widths of one site-potential tree height provide close to maximum effectiveness for the principal ecological functions provided by riparian vegetation for protecting water quality and fish habitat.

However, the FEMAT approach doubles the site-potential tree height. The implicit but unstated rationale for this seems to be based on either recruiting large or coarse woody debris into the buffer zone, moderating riparian microclimate, providing wildlife habitat, or some combination of these functions (O'Laughlin and Belt 1995).

Following the FEMAT tree-height rationale in Figure B-2 and then doubling it, a 200-foot buffer would seem to be the appropriate width for adequate protection of ecological functions in forests east of the Cascade Mountains. Furthermore, regulating sediment flow is a major riparian area function of particular importance to fish and other aquatic organisms. FEMAT suggested a 200-foot buffer, measured from the edge of the floodplain, would effectively remove sediment in most situations. Yet the PACFISH prescription for eastside forests remains 300-foot buffers until Watershed Analysis is implemented. This may be because PACFISH has goals other than reducing sediment yield and protecting aquatic habitat.

The FEMAT/PACFISH approach is designed primarily to streamline federal agency consultation requirements under section 7 of the ESA. Secondly, the approach will augment planning requirements under the National Forest Management Act, the Federal Lands Policy and Management Act, and nonpoint source pollution control requirements



Source: FEMAT (1993, Figure V-12, p. v-27).

under the Clean Water Act. The current PACFISH strategy is to implement 300-foot minimum-width buffer strips for 18 months (dating from March 1995) while NEPA environmental impact statements are prepared for federal ecosystem management alternatives across the Pacific Northwest in the Interior Columbia River Basin.

**Salmon Critical Habitat.** On December 28, 1993, NMFS published its final rule on designated critical habitat for the Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon:

As a reasonable benchmark, NMFS defines the "adjacent riparian zone" as those areas within a horizontal distance of 300 feet (91.4 meters) from the normal line of high water of a stream channel or from the shoreline of a standing body of water. NMFS points out that this definition is adopted solely as a means by which agencies can evaluate the potential risk of proposed actions on designated critical habitat. The actual delineation of riparian zones at the site of a proposed action can be more accurately identified through section 7 consultations. (58 *Fed. Reg.* 68549 [December 28, 1993]).

The Snake River critical habitat decision appears to have been influenced by FEMAT/PACFISH buffer zone determination. Smith (review comments) pointed out that recent critical habitat and "jeopardy" determinations concerning the chinook salmon have not been confined to narrow interpretations. Designation of critical habitat for the chinook expressly includes all areas historically occupied (A. Smith, review comments). However, river reaches upstream of Hells Canyon Dam on the Snake River and Dworshak Dam on the North Fork of the Clearwater River, are excluded, even though those areas may have historically been occupied and constitute a significant portion of the historic habitat (Feldman, review comments).

Much of the concern about salmon in Idaho is keeping sediment from streams, which is also a goal of the Clean Water Act and implemented by state forest practices acts. These have proven to be effective, if applied. The hundreds of "water quality limited" stream segments in Idaho underline the problem of separating human-caused sedimentation from

natural processes.

Idaho and the other states in the Pacific Northwest have been required to protect salmonid habitat for more than 20 years to comply with the federal Clean Water Act by developing and implementing best management practices. Because of both the ESA and the desire to take an ecosystem or multispecies approach, federal agencies have started from scratch and designed aquatic and riparian habitat protection strategies that require managers to perform analysis to demonstrate that the proposal action will neither adversely affect water quality nor degrade riparian habitat.

If a stream or river supports one kind of salmonid, say, for example native cutthroat trout, why must additional protection measures be installed? One answer is that harvest levels are different (T. Bjornn, review comments). Another is that salmon or bull trout have different habitat requirements that may not be met merely because other salmonids persist in the same streams and rivers. Salmon and bull trout may serve as umbrella species whose protection promotes healthy conditions for other species not facing extinction. Riparian-dependent, not just aquatic-dependent, species are being protected. This is consistent with an ecosystem-based approach to land and resource management and a multiple-species approach to species conservation under the ESA, both of which federal agencies have pledged to the public they would do.

A final lesson on streambed maintenance is from the fish themselves (see Sidebar B-3). Sedimentation is a natural process, and salmonid fish have adapted to that. However, that is no excuse for allowing additional sediment from land management activities to enter streams.

### Recovery Plan

Based on recommendations offered by the Snake River Salmon Recovery Team (1993) that the NMFS assembled for that purpose, a draft recovery plan was completed and released on March 20, 1995 (NMFS 1995b) and will likely be in final form by the end of 1995, after public review and comment.

As a practical matter, the recovery of

species listed as threatened and endangered involves identifying and mitigating the factors causing endangerment. When there are many factors, as there are in the salmon situation (see Table B-1), the determination of the causes upon which agencies should attempt mitigation actions is problematic. The key policy question is therefore not what is killing salmon, but what can be done to restore salmon runs and what are the costs of restoration.

According to Dietrich (1994), after spending more than \$1 billion during the past 10 years attempting without success to increase salmon runs in the Columbia Basin, some scientists wonder if they even are asking the right questions, let alone providing the right answers. Salmon are hard to observe and track and are threatened by dozens of environmental problems throughout their vast range (Dietrich 1994).

The majority of fishery scientists in Idaho are active members of the Idaho Chapter of the American Fisheries Society (ICAFS). These scientists know what the problem is—the operation of eight hydropower dams on the Snake and Columbia River systems (ICAFS 1995). The ICAFS (1995) endeavors to provide an unbiased consensus of opinion on the issue of salmon recovery:

[O]ther factors, including overharvest and loss of spawning and rearing habitat, have clearly affected salmon populations. However, both losses are small compared to smolt migration mortalities of 70%-95%. Without improving migration survival, preservation of, much less recovery of, Idaho's salmon populations is not possible—regardless of improvements made in other areas...

The ICAFS believes sufficient work has been conducted to recommend immediate substantive changes in existing hydropower operations in the lower Snake and Columbia Rivers. Research supports that improved salmon survival is dependent on increasing river velocity and spilling water over the dams.

Do we *know* that the recovery plan will be effective? Unfortunately, the answer is no. Science does not work on absolutes and guarantees... We *can* confidently state that continuing the status quo operation on the lower Snake River hydropower system will cause extinction of Idaho's salmon. (ICAFS 1995).

### Sidebar B-3. Spawning Salmon Overcome Damage in British Columbia

Sockeye salmon runs on the Horsefly River, pushed to the verge of extinction half a century ago, have been revived with the fish themselves doing much of the work.

Good science, gumboot biology and an almost unbelievable drive by the salmon to reassert themselves in the river were the big factors, fisheries biologists said.

In the early 1900s, the upper river was dammed by miners, blocking hundreds of thousands of sockeye from their spawning grounds. At the same time, other parts of the river were devastated by mining and agricultural development.

Around 1930, a government geologist reported that gravel beds used by spawning salmon were smothered with silt 13 feet deep. Cleaning the stream was considered an impossible and unbelievably expensive task.

By 1940, the Horsefly River's spawning run of four million sockeye had been reduced to 2,000 fish.

This fall the run amounted to nearly 13 million fish, of which about 10 million were taken by commercial, native and sports anglers and the rest were allowed to reach spawning grounds.

The river near this town about 240 miles northeast of Vancouver flows into Quesnel Lake, which is drained by the Quesnel River, a tributary of the Fraser River. The Horsefly is credited with producing more than half the 22 million sockeye that returned to the Fraser River system this year.

"It looks just fantastic," Canadian fisheries biologist Ian Williams said, "It's music to my eyes. It's an excellent spawning."

Biologists knew salmon move a lot of gravel with their tails to dig spawning nests.

Williams came up with the idea of using that process to clean the river. He argued that although many eggs would die after being laid in silted gravel, the spawning activity would still help rebuild the gravel beds. Over time, he said, the fish might clean enough gravel to make the sacrifice of some sockeye worthwhile.

Over the years, millions of salmon worked in successive waves to improve the river.

"Fish actually move the gravel around more than floods," said Williams, who's spent much of his 30-year career working on the system. "Of course, you need lots of fish to do that." Salmon runs have been strong on many rivers in the province this fall, "but the Horsefly is the story," Williams said.

Source: Associated Press (1993h).

The lack of reliable biological information makes recovery planning uncertain and leads to estimates of cost-effectiveness that lack precision. You cannot say much about cost-effectiveness if you cannot determine effectiveness.

**Recovery Goals and Costs.** The ESA requires the agency to not only protect listed salmon, but recover them to the point where protection is no longer necessary. The recovery goal for Snake River sockeye salmon is when over the course of eight years, an average of 1,000 wild spawners return to Redfish Lake and 500 return to each of two of the four other lakes in the Stanley Basin. In 1994, only one wild

sockeye returned to Redfish Lake. The spring/summer chinook salmon recovery goal is met when the number of redds increases to 60% of pre-1971 levels and 31,440 wild fish are counted at Lower Granite Dam. About 1,800 were counted in 1994. Fall chinook will be "recovered" when 2,500 wild fish return to the Snake River annually. Only 404 made it in 1994 (NMFS 1995b, *Spokesman-Review* 1995a).

NMFS is obligated under the ESA to include in the recovery plan, which is now undergoing public review, estimated expenditures from the federal budget for recovery actions. However, the cost analysis is limited to budget expenditures. The

exception is that an analysis of social and economic or any other impacts associated with critical habitat designation is permitted. The identification and designation of critical habitat is part of the ESA listing process. Critical habitat has been designated for Snake River salmon. The NMFS determined there were no significant costs involved in the designation.

How much will salmon recovery cost? In 1992, Senators Bob Packwood (R-Oregon) and Slade Gorton (R-Wash.) asked the U.S. General Accounting Office to come up with an answer. The US-GAO (1993a) studied the question for nine months and came to the inconclusive result that annual costs could be anywhere from \$2 million to \$211 million, or more (Associated Press 1993g).

The 500-page recovery plan released on March 20, 1995, adds \$160 million per year to what some estimates say is already \$300 million per year. By one report (Loftus 1995b), William Stelle, the NMFS regional director in Seattle, said the federal government will pick up \$60 million of the additional cost, and by another report (*Spokesman-Review* 1995a) would cover \$90 million to \$110 million. Stelle said a University of Washington team will be working on a comprehensive cost analysis during 1995.

A comparison of recovery cost estimates to revenues from hydroelectric power production and salmon harvest was requested to be included in this report (J.M. Scott, review comments). Dietrich's (1995) book *Northwest Passage: The Great Columbia River* provides not only the requested data, but perspectives as well:

Some argue that as enchanting as vibrant salmon runs might be, the quest to save them is economically unjustifiable. The Columbia and Snake provide \$3 billion in power per year, water \$5 billion in irrigated crops, support eleven large aluminum mills, and move 8 to 10 million tons of cargo by barge. The river's salmon industry, in contrast, produces fish that at the most optimistic estimate create revenues about a twentieth as large. (In 1982, however, economist Phillip Meyer estimated the value of the fish already lost to dams at an additional \$372 million a year.)

The salmon that survive persist at a subsidized cost in bureaucracy, hatcheries, and lost power revenues that equals \$50 to \$200 per

adult fish produced, far more than they are worth as food. An estimated \$500 million has been spent on hatcheries, ladders, and other improvements on Columbia dams alone, and spilling water has arguably cost the region so much hydroelectric energy that it has eaten up the energy savings of a decade of expensive conservation projects. Common sense might suggest that the salmon's reign on the Columbia has ended, like that of the buffalo on the Great Plains.

Rate payers already spend about 4 percent of their electric bill on fish programs—one to two dollars per person per month for a typical household—and might have to spend a percent or two or three more if biologists are heeded.

"What does society want to do here?" [Michelle] Dehart [of the Fish Passage Center] shrugged. "We're not going to freeze in the dark if we sustain the salmon runs, but we're not going to get back to historic levels of salmon production, either. It all boils down to money."

Dan Huppert, a marine economist, said the cost to help salmon is insignificant in a regional economy of \$189 billion. "There are a lot of games being played," he said. "Every interest group has an incentive to overestimate the costs to it."

Still, perhaps salmon enthusiasts are living in the past. (Dietrich 1995, pp. 351-352).

According to a study by the General Accounting Office, between 1981-1991, \$1.3 billion in federal expenditures was used to maintain and improve salmon runs in the Columbia River system, which includes the Snake and Salmon Rivers and their tributaries in Idaho (US-GAO 1993a). The salmon stocks that spawn in Idaho have continued to decline in spite of these expenditures. Berry and Rettig (UTF 1994b) said these expenditures are a small portion of the total costs of salmon protection, because lost opportunities by private sector operators are also costs. These include commercial and recreational fishing and related business, aluminum refining plants, barge transportation users, and marinas and tourism-related businesses. All bear additional costs. Some of these losses are offset by gains, such as by railroads and truck transportation and other recreation businesses. Once salmon stocks recover, new economic opportunities should emerge (UTF 1994b).

A key question in salmon recovery is who



should pay? Saving species requires change, and change creates costs. Who should bear them? Berry and Rettig (UTF 1994b) provided an overview of the legal, economic, political, and ethical perspective necessary to develop a fair reply to these economic equity questions.

After the recovery plan is finalized, it is possible that the Endangered Species Committee (or "God Squad") could be petitioned and asked to exercise its authority to exempt the petitioner's project(s) from the ESA. The committee could then determine if such an exemption is in the national and regional interest, and outweighs the importance of recovering the species.

***Factors Causing Salmon Decline.*** What caused Snake River salmon runs to decline? Most scientists agree that hydropower dams in the Columbia River system are the single largest human-induced cause of mortality in Snake River salmon populations.

During an interview, Donald Bevan (1993), Chairman of the Recovery Team, indicated that some people are saying, "Put your attention on the big things.... Go fix the dams." He said, "If that's the case, they're going to be disappointed, because we're not going to do first the things related to the largest contributor to mortality. We're going to do things first that are capable of making some changes in [fish] survival. We're going to be accused of only tweeking the hydropower system."

Question: Is the hydropower system the largest contributor to Snake River salmon mortality? Dr. Bevan: "Yes. Most of the human-caused salmon mortalities are in the downstream passage through dams and reservoirs. Nobody can really argue that" (Bevan 1993).

Table B-1 reveals the complexity of factors involved, and selecting an effective combination of actions to mitigate any combination of factors is a complicated undertaking.

The Northwest Power Planning Council was created by federal law in 1980 to ensure that fish and wildlife, including salmon, receive "equitable treatment" in the operation of the Columbia River system, as required by law.

In its 1994 annual report to the U.S. Congress, the Council said

This year only about 600 naturally spawning Snake River spring chinook salmon are expected to return above Lower Granite Dam. The outlook for summer and fall chinook is similarly disastrous. We know there are many reasons for the decline of these runs, some human-caused, others not. The impact of dams, historic overfishing and poor hatchery practices, for example, can be blamed, and so can damage to spawning and rearing habitat. Much of the reduction in this year's runs may be attributable to the seven-year drought in the Columbia Basin and to very poor feeding conditions in the ocean. (NPPC 1994).

The NMFS commissioned the Snake River Salmon Recovery Team to draft recommendations for the required ESA recovery plan. Under the ESA, the agency must identify the factors responsible for causing the decline of Snake River salmon. The list of such factors is long (see Table B-1). The seven scientists on the Recovery Team have not formally prioritized them, and said the Team is committed to a comprehensive ecosystem approach to restore Snake River salmon and to remedy, to the extent practicable, the human-induced habitat hazards encountered by salmon throughout their life cycles. Priority attention should be directed to environmental factors limiting salmon growth and survival. However, the severity and location of these limits vary with stocks of concern, and significant gains can be achieved by improving habitat conditions of all spawning and rearing areas and along the migration corridor. For these reasons, the Team rejected arguments stating that the only remedy needed to restore Snake River salmon runs is to prevent the hydropower system from killing migrating fish in the river mainstem. The Team recognized that unseeded, good-quality spawning and rearing habitats presently exist in many of the tributaries to the Snake River; however, because other important habitats have become degraded, the argument that all we need is more fish returning to the spawning ground was rejected. The alternatives for priority action need to be sorted out, identified, and prioritized (Snake River Salmon Recovery Team 1993). The

NMFS proposed recovery plan (NMFS 1995b) did not do the sorting out or prioritizing of alternative actions.

**Actions to Recover Salmon.** What can be done to restore declining Snake River salmon runs? The University Task Force on Salmon and the Columbia River System (UTF 1992) reviewed 31 actions that could be taken. Approximately 18 governmental agencies are involved with salmon management in the region. A variety of agency reports related to recovery efforts have been reviewed, and comments in the remainder of this case example are based on that material.

The U.S. General Accounting Office (GAO) summary of the effectiveness of measures involving changing the flow regimes on the four Snake River dams is perhaps the most telling of all:

[None] of the more than 300 agencies and organizations we contacted identified any scientific studies that address the degree to which any of the proposed protection measures might increase the number of threatened or endangered adult salmon returning to spawn. (US-GAO 1993a).

People, including some scientists, tend to identify one factor or another as the principal causal factor, and therefore the solution to salmon recovery. However, most scientists point out that this single-factor approach has not worked in the past, and cannot be expected to work in the future. Some factors (see Table B-1), however, seem to require more immediate attention than others.

Considering the respective roles of what are called the "four H's" of salmon recovery (Habitat, Harvest, Hatcheries, and Hydropower), it seems that harvest and hydropower are the most pressing needs, because they seem to be the most significant human-induced mortality agents. **Harvest**—Reduced harvests will relieve the pressure on the few remaining adult fall chinook. However, harvest is not a key limiting factor for Snake River spring/summer chinook or sockeye (Bowles, review comments).

**Hydropower**—An experimental approach to a full range of dam passage alternatives seems necessary because scientists cannot agree on a single best approach, in part because of the

lack of sufficient data. Barging and flow modification are two such approaches to assist juvenile salmon outmigration to the ocean. Attention to hatchery and habitat management may also be necessary. **Hatcheries**—Using hatchery fish as a supplement to wild fish requires some consideration in light of genetic impacts, reduced natural production, and ecological interactions in overcrowded habitats. **Habitat**—Existing spawning and rearing areas need continuing protection, and there are policies already in place to ensure some level of protection, specifically the Clean Water Act and state policies for implementing it. Without concerted efforts on mitigation of other factors, increasing the quantity and quality of spawning and rearing habitat may not have much effect in the short term, or appreciable effect on salmon recovery in the long term.

**Using Additional Idaho Water for Salmon Recovery.** An important issue in Idaho is how to get juvenile salmon, or smolts, through the eight reservoirs associated with hydropower dams in Washington and Oregon on their way to the ocean. The two alternative actions involve Idaho water and increasing the velocity of water flow in the Snake River. They involve (a) **drawdown**—this does not require additional water to increase velocity and involves lowering the level of reservoirs behind the four Snake River dams by drawing down reservoir levels for some distance below optimum pool height for power generation, and (b) **augmentation**—this uses additional water to achieve greater velocity by releasing stored water from reservoirs on the middle and upper reaches of the Snake River, including Dworshak Reservoir on the Clearwater River northern Idaho, and many reservoirs in central and southern Idaho. In summary, under some seasonal rainfall conditions there is not enough total water storage in Idaho to obtain the water flow velocities recommended by fisheries professionals to simply add water to the Snake River system; if lower Snake River reservoirs are drawn down, the recommended velocities can be attained with less water (F. Sherman, review comments).

Analysis of the augmentation alternative is available (see UTF 1994a) and came to these

## conclusions:

- The Snake River basin is almost fully appropriated, especially during dry years.
- Efficiency improvements will produce little, if any, new water for fish. It may be possible to alter the timing of water flows for fish in the short run through interaction with the Snake river plain aquifer, but in the long run new flow-augmentation water must come from a reduction of consumptive use. Water taken for fish means less water for farmers and other instream uses, and the key issue is how best to obtain that water.
- A dry-year option market might provide up to 1.2 million acre feet (maf) of additional water for fish needs during dry years (provided it is not needed every year). Farmers could agree to provide up to 50 percent of their normal consumptive use for which they would be paid from the hydropower value of the water.
- Expansion of the Idaho water banks has been suggested as a way of obtaining additional water for fish. Care needs to be taken to ensure that any water taken from the water bank comes from reduced consumptive use. If not, then third-party water users are likely to be hurt and long-run return flows from the Snake River Plain aquifer reduced as a result.
- If water is needed for streamflow augmentation every year, then a retirement plan for marginal farmland might be a good strategy. This water would have some hydropower value which could help fund such a program.
- Serious institutional, legal, political, and hydrologic issues would have to be addressed before any of these market alternatives could be considered. (UTF 1994a).

In 1992, the Idaho Legislature authorized a test period for water rentals for flow augmentation. Frank Sherman, ESA coordinator for the Idaho Department of Water Resources, provided the following information about this in his review comments for this report:

Idaho law (*Idaho Code* § 42-1761) provides that the Idaho Water Resource Board shall operate a water supply bank. The Board can, and has, authorized local committees to facilitate the rental of stored water (Boise, Payette, Upper Snake and Shoshone-Bannock). When managed locally the term that is used is "rental pool," except the Shoshone-Bannocks call theirs a water bank.

The law does not constrain the length of lease, however it is only relatively recently that

the Board and local committees have agreed to long-term leases. The evolution of rules providing for long-term leases is unrelated to legislative action to provide water for flow augmentation for salmon.

In 1992 the legislature amended Idaho Code 42-1763 to allow leases for use outside the state. They also added 42-1763A which provides a test period for water rentals for flow augmentation for salmon. During the test period such leases do not have to meet other requirements of state law providing the IDWR Director determines that the water is part of a regional coordinated effort and that other parties are making a proportional contribution to solving the salmon migration problem. The Director of the IDWR, Keith Higginson, has stated that there are not sufficient data available to make a determination. Interestingly, in 1994 when extending *Idaho Code* § 42-1763A to January 1, 1996, the legislature stated: "The Legislature of the State of Idaho is not satisfied that the federal agencies charged with operating the Federal Columbia River Power System have mandated or implemented regional contributions to restore Snake River Salmon on a proportional basis."

After the test period the legislature must approve movement of blocks of water of 5,000 acre-feet or more, or of flows of 50 cfs or more. In addition, the Director must make a number of findings including that the lease will not conflict with the local public interest (impact on local tax base and infrastructure).

Three of the four local pools now functioning in Idaho are managed by water districts. The pools have procedures that establish the price for water leases and provide irrigators within the district with the first opportunity to rent any water available. While the cost of renting water might increase, an uncontrolled bidding war seems unlikely. (F. Sherman, review comments).

The Idaho Legislature in 1992 gave temporary approval to the Bureau of Reclamation to move water downriver for salmon if other measures were taken in Oregon and Washington to save imperiled Snake River fish runs (Associated Press 1995g). The authority expires in 1996. In May, 1995 Bureau of Reclamation officials filed an application to obtain permanent water rights for 427,000 acre-feet of river flows to benefit endangered salmon (Associated Press 1995g). The bureau's application would make the

salmon-water transfer permanent, but requires approval from the Legislature. (Associated Press 1995g).

Bureau Regional Director John Keys said he is required by the Endangered Species Act to boost Snake River water flows for salmon. If water users refuse, the National Marine Fisheries Service could ask for more, he said (Associated Press 1995g).

However, most Snake River irrigators oppose the bureau's proposed change in water rights. So far, 80 parties, including irrigators, state agencies, health districts and others, have filed formal protests (Associated Press 1995g). The state water agency planned hearings in October 1995.

In September 1995, Idaho water authorities granted a three-week cease-fire in the turf battle between the U.S. Bureau of Reclamation and Snake River irrigators over the 427,000 acre-feet of water (Associated Press 1995g). At the request of attorneys on both sides, Idaho Water Resources Director Karl Dreher granted the three-week stay in hopes that parties can settle the conflict out of court (Associated Press 1995g).

The three-week reprieve will delay that hearing until late November 1995 at the earliest, if negotiations break down (Associated Press 1995g).

Fisheries agencies and Indian tribes have long pressed for more water in rivers throughout the Northwest for fish. However, the aluminum industry, barge companies, and utilities say there is little evidence that releasing stored water is doing any good. This "holy war" has pitted scientist against scientist, each citing inconclusive studies dating to 1979 (Dietrich 1994).

The absurdity of the situation was highlighted in a February 1994 meeting to coordinate salmon-related research. John Williams of the NMFS told the gathering his agency wasn't allowing release of some of the data he claimed support his contention that increasing water flows are of little help. After Williams' shouting match with a scientist from the Fish Passage Center, the meeting settled down to explore how much science still doesn't know about salmon (Dietrich 1994). According to Barker (review comments), Williams' unwillingness to work with state and

tribal scientists has until recently given Don Chapman and other consultants employed by hydroelectric power interests unfair access and weight in deliberations by NMFS scientists.

Dietrich (1994) said many results are baffling. For example, there is a correlation between increased water flows and juvenile salmon survival during migration (Cada et al. 1993). However, survival of young salmon heading downstream does not seem to guarantee the return of more adults (Dietrich 1994).

Donald Bevan, the leader of the team of seven scientists contracted by the NMFS to develop the draft salmon recovery plan, said the team did not have all the answers. "I was asked by a senator in Washington, 'How much water do we really need?' I would have liked to have said, 'Damned if I know'" (Loftus 1994b).

**Conclusion on the Priority of Actions.** The eight hydropower dams on the main-stem of the Columbia and Snake Rivers are widely recognized as the largest human-induced factor contributing to salmon mortality. Transportation of fish around the dams and modification of water flow regimes through the dams are two approaches, each with several alternatives. However, the solution to recovering imperiled salmon runs involves more than trying to fix any single factor. Most scientists say only a comprehensive, life cycle view of salmon will ultimately ensure them their place in the future of the Pacific Northwest (see Sidebar B-4).

The immediate task under the ESA is to identify and prioritize a combination of actions that will promote survival. That cannot be done effectively without an information base, which is currently lacking in quantity and quality. The Northwest Power Planning Council views its experimental "adaptive management" approach as a "vehicle for learning" by which actions, "even if they fail, should provide useful information for future salmon-protection actions" (US-GAO 1993a). Such an approach should be encouraged, and dam passage is a good place to start.

The ESA mandates that recovery action take place. People up and down the Columbia and Snake Rivers are being adversely affected by

## Sidebar B-4. Center for the Study of the Environment on Salmon Decline Factors

This academic think tank in Santa Barbara, California, was commissioned by the state of Oregon to recommend a strategy for salmon conservation and management in western Oregon and northern California, especially as it relates to forest practices. The scientists recognized the lack of scientific information and called for a multiple factor approach:

Natural ecological systems are complex, and the sciences that deal with these systems are new.... There is a significant lack of basic information—information about the current state of the environment, about how the environment has changed in the past, and about what the environment was like before large-scale and accelerated human intervention and the impacts of modern technological civilization. Such information is necessary if we are to make realistic projections about how the environment will change in the future.

Today, following a generation of rapid growth in environmental science, there is recognition that the basis for conservation and management lies in the broader contexts of ecosystems, landscapes, and even in the global context.

In past years, the controversy surrounding anadromous fish has tended to seek a single factor as the *cause*. In reality, the situation is much more complex because many factors affect survival, growth and reproduction of anadromous fish, and the state of these factors change over time .... Clearly, in the future there must be fish and there must be habitat. Past attempts to seek a single cause have led some to blame all the alleged problems on the destruction of habitat and others to place blame on the overharvest of the fish.

An alternative possibility is that factors interact and that changing one factor can influence the importance of another factor. In populations with complex life histories, such as the anadromous fish, an action at one stage in the life cycle can affect the outcome at other stages. For example, high mortality in the ocean can affect the number of eggs laid on the spawning ground, and the number of fish that survive the first stage of life on the spawning grounds can influence the abundance of fish in the ocean, and therefore affect ocean mortality rates.

Source: Botkin et al. (1993).

the uncertainty created by the situation, which is exacerbated by the slow and cautious actions of the NMFS as they consult with other federal agencies about activities on federal lands, and with state agencies about hatchery operations and other activities that involve federal funds. Modifying dams or water flow regimes involves substantial costs as well as a variety of complex technological considerations. Fixing the dam problem affects a wide variety of user groups, including utility rate payers. That includes everyone in the region, thus is guaranteed to generate much controversy.

A perspective shared by many Idahoans is that the NMFS, quite naturally but perhaps unfairly, seems more comfortable working on upstream habitat and hatchery problems instead of the more controversial hydropower issues. Idahoans thus may be expected to feel they are being singled out to do more than their fair share in the recovery of Snake River salmon,

perhaps because the vast majority of spawning habitat is in Idaho. According to the Idaho Department of Fish and Game, Idaho is not the problem (see Sidebar B-5). That view may be parochial, and is likely to be the same view expressed by people in Oregon and Washington, but for other reasons. A key difference is that people in Oregon and Washington can catch some stocks of salmon, and Idahoans cannot. That inequity is changing—but, unfortunately, in the wrong direction—as populations declined further in 1994 and the NMFS imposed stringent harvest restrictions in Oregon and Washington.

Designing research to test a hypothesis as to which state is being treated the most unfairly or which of the "four H's" is being given the most attention would be a major research undertaking. It would also be of questionable value under the ESA, because the Act requires agencies to ignore social and economic impacts in all but the very limited circumstances of

## Sidebar B-5.

## The "Idaho Plan" Addressing Salmon Habitat

These excerpts from the "Idaho Plan" for salmon recovery (Andrus 1990) are clearly intended to divert attention away from habitat concerns and toward hydropower:

Idaho has over 4,000 miles of spawning and rearing habitat for spring, summer and fall chinook. About 9 percent of that habitat is rated as excellent, 35 percent is rated as good, 44 percent is rated as fair, and 13 percent is rated as poor. Most of the habitat in the fair to poor classes is not rated as such because of habitat degradation, but because the natural features of the habitat (primarily gradient) are not suitable for chinook salmon, but are more suited to steelhead production.

Over 1,000 miles of production area remain for wild spring and summer chinook within the state, of which 53 percent is considered good or excellent quality. Vast areas of habitat are protected by Idaho wilderness designation. Additional large areas, such as the Sawtooth National Recreation Area and South Fork Salmon River (SFSR) drainage in the Boise and Payette National Forests, have anadromous fish habitat protection as top land use and water quality priorities. There are, of course, localized areas of severely degraded habitat.

Total production potential of Idaho and Snake River habitat was estimated in the Columbia basin systems and sub-basin planning process to be almost 22 million smolts. This includes 6.75 million wild and 9.56 million natural spring and summer chinook. While an enormous potential for natural smolt production of chinook exists, the potential is not being met.... The average counts from 1985-1988 [indicate] wild juvenile chinook production was only 1 to 31 percent of potential. Natural juvenile chinook production was only 2 to 40 percent of potential. Regardless of habitat quality, juvenile abundance is far below the potential production capacity.

Neither the depressed populations nor the recovery of Snake River salmon result from the quantity or quality of natural production habitats. Chronic high mortalities of juvenile fish at main-stem Columbia and Snake River dams result in insufficient adult fish to utilize the available habitat. Meanwhile, vast areas of potentially productive habitat are available.

Juvenile production is well below potential in all habitats, from poor to excellent condition. High mortality of existing natural production is limiting adult returns from that production. Habitat improvement actions to increase production will not contribute appreciably to increasing adult run sizes as long as excessive mortality continues at the eight Army Corps of Engineers main-stem dams on the lower Snake and Columbia River systems.

Source: Andrus (1990).

critical habitat designation, which has already been done but is largely irrelevant, and the enumeration of expenditures from agency budgets for recovery actions. If the ESA were modified or projects affected by Snake River salmon exempted from the ESA, the responsibility for salmon management and fair treatment of all Columbia River resources falls back on the Northwest Power Planning Council (NPPC), as it has since 1980. The NPPC has its own plan for salmon (NPPC 1994), but a plan without implementation is only a document, and the NPPC has no authority for plan implementation.

Regardless of who will be in charge of salmon conservation and what success they may have, one thing seems clear to some observers. Andy Brunelle, former Governor Cecil Andrus' natural resources aide and, for a

short time, a member of the NPPC said, "Congress will ultimately have to be called upon to take affirmative action to protect the Snake River salmon runs" (Brunelle 1993, p. 36).

### Conclusions

Idaho is fortunate to have the habitats that support some of the most magnificent creatures on earth, including grizzly bears, whooping cranes, bald eagles, and salmon. These species, and others, give Idahoans a special quality of life available in few other places. The ESA forces a recognition that without considering the impacts of human activities, our companion species could be lost.

Until quite recently, conservation of species protected by the ESA caused few problems in

Idaho. This changed with the listing of salmon in Idaho in 1991, and with the recognition that bull trout may be declining. Conservation efforts for these species may require significant changes in management practices across much of the state.

Can the ESA find the balance between ecological needs of dwindling salmon runs in the Pacific Northwest and the social, economic, cultural, and political importance of the streams and rivers that salmon traverse when they enter fresh water to reproduce? This is a multi-billion dollar question. Perhaps other policies should be expected to fix the salmon situation, not the ESA.

The ESA was invoked because of the failure of other federal laws to adequately protect salmon. The biological needs of salmon are fairly well known after more than 75 years of scientific study. The factors causing their decline involve a complex mixture of harvest limits, hydropower dams, hatchery supplementation, and habitat maintenance. Mitigation actions that would allow existing resource use and recover salmon populations are not well understood. In Idaho, the concerns are more specific to habitat maintenance, which is why this case study focused on habitat. Issues related to hydropower, harvest, and hatcheries are equally as complex as habitat.

When an endangered or threatened species is present, the ESA drastically affects activities on the federal lands (Coggins and Glicksman 1995) and overrides previous plans. The protection given to listed species by the ESA can also impact state and private land. The listing of the northern spotted owl in the Pacific Northwest in 1990 is an example of how one protected species can bring activities on federal lands to a halt until species conservation is adequately provided for. In the case of the spotted owl, federal judges have made all decisions about federal land-use in a three-state region since 1990, and there is every indication they will continue to do so. Is there an end in sight? Wilkinson (1992) said:

The judicial decisions in the Pacific Northwest have raised such large issues that Congress will almost certainly have to take some definitive action. Congress is the right forum

because of the institutional limitations of the Forest Service and because the real issue is a congressional-level matter: the mission of the national forests in the foreseeable future. (Wilkinson 1992, p. 171).

Perhaps the same could be said of Columbia River salmon. The real issue is a congressional-level matter: the operation of federal hydroelectric power dams in the foreseeable future, and their effect on the economy and ecology of the Pacific Northwest. The issues seem insurmountably large for the ESA to handle. No one has an acceptable solution, and now that the ESA has been invoked, indifference and indecision are no longer acceptable. Consider what Dietrich (1995) concluded about the situation:

No serious proposal has yet been made for dismantling dams of this scale. With no agency in charge of the river, none has been bold enough to even study if some of the engineering should be reversed, even though that is one of the most obvious options. Nor has any agency ever seriously considered the second most obvious solution; conceding that the Columbia has been fundamentally changed, that salmon can never thrive in an ecosystem so drastically altered, and that the huge sums being spent on Columbia salmon in what has so far seemed a futile rescue attempt would be better applied to coastal streams elsewhere in the Pacific Northwest or Alaska where fish have a realistic chance of thriving.

Ask environmentalists and biologists where to start revamping the Columbia system, however, and it is usually on the lower Snake. While deconstruction is the most drastic option, far more likely in years to come is continued tinkering with the dams and reservoirs to get salmon past them. The exact kind of tinkering remains unclear. If given billions of dollars to fix the dams, "I'm not sure what I would do next," confessed Don Bevan, head of the recovery team trying to rescue Snake River salmon....

Recognizing today's second thoughts, the federal government has launched a System Operation Review of the Columbia that includes eleven federal agencies, four states, several utilities, seven tribes, twenty citizens' interest groups, a score of private individuals, and several universities. Its task is to review the conflicting uses of the river and reconcile them. No radical changes are anticipated.

And that is about the limit of our modern imagination. The dreams of natives notwithstanding, ... (Dietrich 1995, pp. 400-401).

The one thing America's most beautiful river cannot endure is our indifference. What happens to the Columbia, after all, is what happens to us. The Yakamas say that when the salmon are gone, they will be gone. (Dietrich 1995, p. 25).

In June 1995, the Columbia River Inter-Tribal Fish Commission (CRITFC) released its Salmon restoration plan, with the intention of moving the citizens of the region "to act responsibly and reasonably in returning salmon to the waters in which they were created and which are rightfully theirs" (Strong 1995, p. 2). Ted Strong, CRITFC's Executive Director, made the position of Native American tribes whose culture is enmeshed with salmon clear:

Today the tribes mourn the loss of our companions in nature who helped nurture our bodies, our minds and our spirit. We decry the rising cost of restoring life forms sadistically and systematically destroyed by human encroachment. These magnificent creatures of land, air and water gave purpose to existence. In fact, they gave enough of themselves to sustain a tribal way of life. Today the political, financial, ethical and social behavior of a newly formed society disregards the need for peaceful co-existence between humans and their environment.

The federal, state and private efforts to craft salmon recovery plans have not escaped the attention of the tribes. We appreciate the thought but question the proposed deeds. Efforts aimed at creating singular authorities over salmon management activities are viewed with skepticism. In the most direct terms, creatures of nature, particularly wild salmon, will not respond to human authorities. Natural law must be the foundation on which rests a framework for salmon restoration. The federal and state plans reveal serious omissions of natural history.

We have called upon the federal and state governments to meet with the tribes as three sovereigns to agree on a unified set of actions. Instead of cooperation, an almost paranoid rush to craft legislation for a "cap on BPA fish funds" has set in. The tribes would like to see

Congress issue an edict charging the three sovereign governments with responsibility for agreeing to a restoration plan before any monies in fiscal year 1996 can be spent on salmon related activities. If money talks, then let its voice ring loud and true. (Strong 1995, pp. 2-3).

Where should serious efforts for salmon conservation in the Columbia River system begin? First of all, regardless of CRITFC's position, someone needs to be put in charge of the situation. Then policymakers will be able to assess the situation and make decisions about what needs to be done. When a salmon species is listed under the ESA, the NMFS is effectively put in charge of operating the Columbia River system. Should an agency with the traditional mission of regulating the off-shore harvest of commercial fisheries have this monumental assignment? If not the NMFS, then who should? The Northwest Power Planning Council is an option, but it has other responsibilities, primarily producing power economically, and has had a chance to give salmon "equitable treatment" since its inception. The NPPC's fish and wildlife plan and strategy for salmon are worthwhile efforts, but destined to be shelf documents without implementation authority.

Perhaps a new federal overseer is necessary. Rather than a salmon czar, the Snake River Salmon Recovery Team (1993) recommended a 5-member Salmon Oversight Committee. Regardless of who leads the salmon conservation effort, the tasks are important for the region and will have to involve local interests, including the tribes of Native Americans.

Secretary of the Interior Bruce Babbitt provided an appropriate conclusion when he said, "The salmon is a kind of metaphor for Western resources. You can't simplify any more, you have to 'complexify.' There are more stakeholders, more parties. You have to start this endless process of looking for a consensus that takes advantage of the knowledge of local people, that invents new ways to protect economic activity and protect the environment" (Titone 1994).



## Appendix C: Case Study—Bull Trout

This case study case illustrates the Idaho Conservation Effort. Most of it was written by Kelly Rogers.

The future of declining populations of bull trout is a concern throughout the Inland Northwest. Many biologists believe bull trout are particularly sensitive to environmental change. Modern land-use practices alter the environments where salmonid fishes live, often in unpredictable ways. Alterations include temperature changes, sedimentation, and changes in water flow regimes. The expansion of exotic species—bull trout interact and hybridize with brook trout—and harvesting of fish can also be harmful. Such changes appear to have influenced the decline or disappearance of a number of bull trout populations in recent years (Rieman and McIntyre 1993).

The known range of the bull trout extended from the McCloud River in northern California to the headwaters of the Yukon River in southern Alaska (Bond 1992) and included primarily the states of Oregon, Washington, Idaho, and Montana and the Canadian provinces of British Columbia and Alberta. Bull trout no longer exist in California, and Nevada has one population on the upper Jarbidge River, which now defines the southernmost distribution of the species. Bull trout is recognized as a "species of special concern" by Idaho resource management agencies, a "sensitive species" and "indicator species" by the U.S. Forest Service (USFS), and is currently considered a C1 candidate species by the FWS.

Bull trout is a widely distributed species presenting a conservation and management challenge. The challenge in conserving or restoring bull trout populations and habitats requires an inter-regional ecosystem approach (Rieman and McIntyre 1993) and a cooperative effort among state and federal agencies, citizen conservation organizations, and private landowners such as is occurring in Idaho. Current knowledge of ecosystems is limited, and partnership endeavors to conserve species are as complex as the ecosystems.

On top of biological and bureaucratic complexity is litigation. The bull trout has spawned lawsuits from environmentalists who

say timber harvesting and grazing in the region have decimated its habitat. They want the FWS to list the bull trout under the ESA and the USFS to adopt a hands-off approach to the roadless watersheds where it still thrives (Larmer 1995b).

The threat of an ESA listing has urged the states of Idaho and Montana to create their own plans for the bull trout without the ESA, and the USFS is developing habitat protection plans. The future of bull trout is unclear at this time (Larmer 1995b).

### Conservation Needs Assessment

In a June 1992 memo, the USFS recognized the need to identify factors important in conserving bull trout and called for a interregional conservation assessment. The memo stated:

Species with a wide geographic distributions present a unique and complex conservation challenge. Effective management frequently encompasses multiple ecosystems and forests types and must be coordinated among several Regions and forests. It is proposed that the development of interregional habitat conservation assessments for several selected species will address the species' habitat requirements throughout their inhabited range on national forest and grasslands.

The finished products should include current information on the species' population status and trends; a synthesis of current information about habitat requirements; an assessment of limiting factors; and a discussion of management considerations that can be used to help forests monitor and evaluate effects of their activities on species habitats, and refine management direction for either the forest plan or project decisions, if found necessary. (USFS 1994).

The agency produced a "Conservation Needs Assessment" as a coordinated effort with the help of biologists from state agencies in Montana, Washington, Oregon and Idaho. Somewhere between 50 to 80% of the known populations of bull trout are associated with public lands, many of which are administered by the U.S. Forest Service.

Bull trout have complex, multiple life history strategies that represent important genetic diversity traits within populations.

Such diversity is an important mechanism for maintaining the persistence of a species in a variable environment, thus is important for bull trout conservation. The distribution and abundance of bull trout correlates with a variety of habitat characteristics. The patchy distribution of the species in relation to other species suggests that bull trout have relatively specific habitat requirements, thus making it a species sensitive to environmental change. Bull trout populations have experienced habitat disruption and fragmentation (Rieman and McIntyre 1993). Habitat disruption and land-use management need to be considered in conservation strategies. There is a considerable amount of literature concerning habitat disruption and its effects on salmonid fishes. Conservation biology principles including the concepts of scale, distribution, and connection of habitats and populations, and the associated risks of extinction are areas scientists are less familiar with, but are potentially important.

**Status of Bull Trout.** As is the case with many imperiled species, the best available data may leave something to be desired, and disputes about bull trout data are part of the debate. This section summarizes available data.

Fragmentation and disruption of bull trout habitats leads to isolated populations and isolates or eliminates life history forms, particularly the fluvial (or large-river dwelling) and adfluvial (or lake-dwelling) forms. These habitat effects probably have influenced both local and regional extinction. Of the 438 populations identified, only 5 percent are classified as secure or increasing, and 16 percent are thought to be stable. Sixty percent of the populations with sufficient information on trends in population size are thought to be declining. Fifty-eight percent of the populations that could be classified were considered remnants. The status of half of the populations is unknown (USFS 1994).

Bull trout were historically distributed throughout Idaho, except for the eastern portion of the state. Their historical range in Idaho comprises the Snake River Basin and tributaries of the Upper Columbia River Basin (Conley 1993). Adfluvial bull trout were

historically abundant in Priest and Pend Oreille lakes.

Present distribution is significantly reduced as compared with the historical distributions. The mainstem Snake River from Hells Canyon Dam to Shoshone Falls, including all tributaries upstream of the Boise River, is probably marginal bull trout habitat and likely does not contain a viable stock. Bull trout stocks remaining in the southern part of its range, especially the Snake River basin, are among those most severely impacted by human activities.

Biologists have encountered few new occurrences of bull trout since 1993, but have noted areas devoid of these fish where they once were known to occur. Additional survey work has turned up bull trout in widely scattered segments of their known range in Idaho, mostly in headwater areas where it is suspected that only remnant resident populations may be surviving. Spawning success is very difficult to confirm in much of the bull trout range because a considerable amount of the best remaining habitat is in isolated and inaccessible areas. With the exception of some areas protected within the boundaries of wilderness areas, most streams and rivers within the present bull trout range in Idaho have been modified by human activities. Based upon the best available evidence, bull trout range in Idaho has been reduced by half (IDFG et al. 1995).

On one side of the debate, two scientists hired by the Intermountain Forest Industry Association said the federal government does not have enough evidence to support listing the bull trout (Titone 1995*d*). Where long-term data is available, it shows bull trout populations are generally stable, according to Platts et al. (1995), who wrote, "the most startling revelation we uncovered is that on 96 percent of the bull-trout streams in Idaho, Montana, Washington, and Oregon, there is not a sufficient record of data to determine bull-trout status or populations trend" (Titone 1995*d*).

Platts et al. (1995) found long-term records for just 45 streams in the four states. They concluded from that data that trout populations in more pristine streams are not much different from those in watersheds that have been

heavily logged, mined, and grazed (Titone 1995*d*).

On the other side of the debate, Mike Baden of the Alliance for the Wild Rockies, one of the three Montana groups pushing bull trout litigation, said, "There's a wealth of information about bull trout. Unfortunately, it's all bad news. We did our own status review that took more than two years. We have a couple of file cabinets full of research projects that showed a lot of decline" (Titone 1995*d*).

Responsibility for bull trout status lies with the U.S. Fish and Wildlife Service. Dan Diggs, of the agency's Portland regional office, said the Platts report, sponsored by industry, is "similar to information the Service has had at least since 1993." He forwarded the information to the Service's office in Boise. Service officials there agree there is a lot they don't know about bull trout populations. Biologist Trish Klahr said, "So we go with what the Act says, which is the best available scientific data on hand" (Titone 1995*d*).

Klahr said the Service has conducted detailed analyses of populations in more than 60 watersheds, and in consideration of recent federal and state actions recommended category 9 status for bull trout. She said condition of the populations varies by stream. Some are still being fished (only Lake Pend Oreille in Idaho), and some "are going down the tubes" (Pryne 1995).

A draft memorandum from the Service's Portland office to agency Director Mollie Beattie said bull trout populations have declined, but most of them do not face a strong enough threat to justify a priority rating higher than 9. This is significant because Beattie has advised regional offices to focus on species with listing priorities of 2 or 3 due to a budget cut of \$1.5 million for listing in 1995. Although the Service is barred from any new final listings until October 1, 1995, new listings can still be proposed (Pryne 1995).

The Service draft memorandum says that 10 of the 71 bull trout populations are declining, 25 are stable, one is increasing, and the status of 32 is unknown (Pryne 1995).

### **Habitat Requirements and Implications of Habitat Disturbance**

Bull trout appear to have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993). Although bull trout are present throughout large river basins and migratory forms may use much of the basin through their life cycle, spawning and rearing fish are often found only in a portion of available stream reaches. Rearing and resident fish often live only in smaller watersheds or their tributaries (Fraley and Shepard 1989, Weaver and Fraley 1991).

Five habitat characteristics—stream channel stability, habitat complexity, substrate composition, temperature, and migratory corridors—appear to be particularly important for bull trout (Rieman and McIntyre 1993). Other factors may limit or influence populations, but these five habitat-related factors appear most prominently in the available literature, and are likely important elements for maintenance of healthy populations of bull trout.

Human activities can strongly influence habitats for salmonids. The distribution and abundance of bull trout have been associated with patterns of habitat condition that may suggest habitat disruption has directly influenced many populations (Rieman and McIntyre 1993). Most efforts with bull trout have focused on linkages between habitat condition and survival at a specific life stage (Weaver and Fraley 1991). Fewer studies have focused on population-level responses.

Rieman and McIntyre (1993) stated that although there is certainty that "intensive forest management" will degrade bull trout habitats, scientists cannot predict with certainty how a specific activity, or accumulation of activities, will influence the abundance, resilience, or long-term persistence of a bull trout population. Managers have used thresholds of acceptable change for stream channel or watershed characteristics—for example, the amount of fine sediments present—to minimize the risk to individual populations. However, scientists warn that such thresholds must be

used cautiously because some watersheds and populations may be far more sensitive to disruption than others (Hicks et al. 1991).

**Role of Metapopulations.** The characteristics of bull trout populations are consistent with the metapopulation concept. Local populations are found in individual streams and are at least partially isolated there. The presence of several subpopulations increases the probability that at least one will survive periods of disturbance. Metapopulations will protect the genetic variation available for adaptation to change. Although little is known about metapopulation structure in bull trout, Rieman and McIntyre's (1993) viability analyses support the conclusion that regional persistence of bull trout depends on the maintenance of multiple local populations. The processes of extinction are linked to the resilience of local populations as well as to the condition, structure, and interaction of populations and habitats at larger scales (Rieman and McIntyre 1993).

**Management Considerations and Recommendations.** Rieman and McIntyre (1993) identified an inter-regional and ecosystem-based conservation approach.

*A Conservation Approach.*—Under the existing management regime, diversity may be maintained by identifying core areas for protection and restoration throughout the range of the bull trout. Conservation requirements for other sensitive species such as cutthroat trout, amphibians, salmon, and other birds and mammals have common elements with the bull trout. Therefore, conservation areas will overlap, and the general need for ensuring natural diversity, a more natural disturbance regime, and connectedness among important habitats should be central to most efforts.

*Criteria for Selection of Core Areas:* [1] Core areas must be selected to provide all critical habitat elements; [2] Core areas should be selected from the best available habitats or from the habitat with the best opportunity for restoration; [3] Core areas should provide for a widely distributed collection of local populations within identified key watersheds; [4] Core areas should be large enough to incorporate genetic and phenotypic diversity, but small

enough to ensure that the local populations effectively connect; and [5] Core areas should be replicated throughout the historic range of the species. (Rieman and McIntyre 1993).

A realistic conservation strategy for bull trout cannot proceed in isolation from other conservation efforts (Rieman and McIntyre 1993). Management that attempts to maintain a target species rather than the integrity and function of ecosystems is destined to omit important components and processes that scientists have yet to understand (Hunter 1991).

### Petition to List

A petition was filed in October 1992 by three citizen conservation groups requesting the FWS grant bull trout "emergency listing" under the ESA and declare the bull trout endangered in Oregon, Washington, Montana, Nevada, and Idaho. The petition stated

that the Forest Service considers the bull trout a *key indicator of the health* of many national forests in the region, dramatic declines in its population suggest entire aquatic ecosystems are threatened; bull trout have already gone locally extinct across about half of its known range and is no longer found in California; 90 percent of the bull trout in Montana are at moderate or high risk of extinction, 83 percent in North Idaho and 54 percent in Oregon; bull trout habitat has been degraded as a result of logging, road-building, cattle grazing, mining, poaching, overharvesting, dam construction, irrigation, pesticides and home construction.

Under the procedures of the ESA, the FWS had 90 days to determine whether the petition warranted review of the fish's status. If review was granted, the agency would then have a year to decide whether to list the fish as threatened or endangered under the ESA. During this time, the bull trout was thrust into the media arena where conflicting arguments arose between citizen groups and forest industry concerns about exactly what the implications of listing bull trout would actually be. Citizen groups expressed concern that not enough is being done to protect bull trout, a declining species identified as sensitive to

development, an indicator of the health of the forest, and as in need of federal protection under the ESA. Industry officials, on the other hand, were concerned that bull trout could generate more controversy than Idaho's endangered and threatened salmon runs because their habitat covers a broader area.

The FWS declared in May 1993 that the petition to list the bull trout under the ESA was merited and the agency proceeded with a full status review of the bull trout. The FWS stated that

the petitions and accompanying information indicate bull trout have been in serious decline throughout their historical range due to habitat degradation and loss, genetic isolation, overharvesting, and competition and hybridization with introduced species.

Considerable concern [that it was only a matter of time until bull trout became listed under the ESA] came from the five affected states and landowners. The state's apprehension came from the perceived regulatory atmosphere of the ESA; the listing of the bull trout might negate state efforts at potential management and conservation opportunities for the species. Forest industry representatives feared listing the bull trout would close down logging, grazing, and other land-use practices on public forest lands.

Early conservation efforts to conserve and protect imperiled species and their habitats and the importance of the state's efforts in conserving candidate species on the way toward listing under the ESA is at the heart of the bull trout issues in the West. However, the efforts began immediately to remove threats and prevent listing. Partnerships in this conservation effort are crucial to its success. Partnerships, however, are difficult to achieve.

In October 1993, Washington state requested that the FWS not list the bull trout as endangered in Washington, and asked for a five-year delay in listing to allow the state to implement a bull trout recovery plan with voluntary assistance from public and private landowners. Relying on the section of the ESA allowing consideration of state efforts to protect species (ESA § 4(b)(1)(A)), the Washington Department of Fish and Wildlife emphasized that the state should be given an opportunity to recover the species in order to

avoid additional costs to the state, the federal government, and the citizens of Washington associated with restrictions required under the ESA. The state proposed the development of a draft recovery plan for the species and the development of a joint state and U.S. Forest Service habitat recovery plan for bull trout in the Wenatchee National Forest as examples of their efforts.

Governor Marc Racicot of Montana convened a roundtable on bull trout. He urged land, water, and wildlife managers to practice preventative government and develop an in-state recovery plan for the bull trout. The roundtable recommended that states should take the lead in bringing back the native trout, and called for watershed-specific recovery plans. The governor concluded that "the fish should not be classified as endangered, as listing would crystallize what exists at that point in time and draw lines that prevent partnerships and flexibility" (Devlin 1993).

An MOU was signed between the Boise National Forest, Idaho Department of Fish and Game, and the Boise Field Office of the FWS to implement a Conservation Strategy to protect and enhance bull trout in the Gold Fork River Basin.

A national MOU between the USFS, FWS, BLM, NPS, and NMFS was signed in January 1994 establishing a framework among cooperators to address the conservation of species that are tending toward federal listing, and agreeing to use Conservation Agreements whenever possible throughout the nation. Early conservation actions, the national MOU, and a subsequent state MOU that established the Idaho Conservation Effort were discussed in some detail under Question 7.

Citizen conservation groups requested that the FWS ignore the plea from Washington state officials to delay the listing of the bull trout as an endangered species. In February 1994, Montana citizen conservation groups filed a lawsuit in Washington District Court accusing the Department of the Interior of violating the ESA by failing to rule on the status of the bull trout.

***Warranted but Precluded.*** In May 1994 the FWS decided to classify bull trout as "warranted but precluded." This moved bull

trout from C2 to C1 candidate category status. The bull trout is threatened with extinction because scientists looking at the status of bull trout decided that it warranted listing as threatened, but when ranked against other species, it was given a 9 out of 12 priority ranking. This is an unusual decision in light of the recommendations of the initial February 1994 status review team to make the bull trout a priority 2 species, placing it in the "high and imminent" threat category. A spokesperson for the FWS stated that 80 plants and animals within the range of bull trout are at a greater risk of extinction and in more need of the agency's limited resources.

Between March and August 1994 Idaho's Conservation Effort for bull trout was developed, including a Habitat Conservation Assessment, Conservation Strategy, and a Conservation Agreement between the FWS, the USFS, the BLM, and the IDFG. The IDFG emphasized that the bull trout Conservation Strategy work is that of the state of Idaho, with technical assistance from the federal agencies. The effort is regarded as a state action done in partnership with federal agencies.

Four Montana-based citizen conservation groups filed suit on December 1, 1994, in Portland, Oregon, accusing the government of failing to protect bull trout. The suit accuses the USFS of violating the National Forest Management Act's plant and animal diversity requirement, and cited timber harvest as the reason for endangerment of bull trout. The same groups sued the FWS in November 1994 for failing to list bull trout (Sonner 1994). In late 1994, Governor Andrus and Governor-elect Batt, working on rumors that the federal agency faced a lawsuit to list the bull trout in June 1995, requested in a letter to Director Beattie of the FWS to put off action to list the bull trout. The letter emphasized the need for states to lead the bull trout recovery effort.

A state MOU formally establishing the Idaho Conservation Effort was signed in December 1994. It is the first of its kind in the country, and detailed a framework for cooperation and participation in the conservation of federal candidate and sensitive species, and species of special concern in Idaho (see Sidebar 8-1). The MOU was

signed by the IDFG and IDPR as cooperators and the USFS, BLM, and FWS as supporters. A disclaimer concerning the Federal Advisory Committee Act (FACA) is added that emphasizes the Idaho Conservation Effort as a state-led effort with the federal agencies as supporters only and not signatory cooperators.

### **Bull Trout Habitat Conservation Assessment (HCA)**

As part of the Idaho Conservation Effort, a bull trout Habitat Conservation Assessment Conservation Strategy has been completed. It stated the following:

This is an interim conservation measure under the Endangered Species Act. It applies to the range of bull trout within the State of Idaho and the headwaters of the Jarbidge River Basin in Nevada. The intent of the Conservation Strategy is to reverse the decline of bull trout populations in Idaho, and restore their habitats.

Conservation Agreements between the State of Idaho and the Federal Land management agencies, private corporations, state land management agencies or private individuals will provide the mechanism for implementation.

Bull trout are the target species of the Conservation Strategy. However, other federal listed and candidate fish species such as redband trout, westslope cutthroat, steelhead trout and chinook salmon may also benefit from proposed conservation actions. Animals other than fish such as neotropical birds, grizzly bear and grey wolf may also benefit. (IDFG et al. 1995)

### ***Population and Habitat Assessment Status.***

In Idaho, bull trout no longer occur in many areas within their historical range and recent information indicates broad declines and widespread habitat disruption. Of the populations with sufficient information to judge status, 72 percent are declining (USFS 1994). The Forest Service's Conservation Needs Assessment for bull trout asserts that factors suppressing habitat quality are: forest management (93%), grazing (67%), mining (33%), agriculture (25%), hydropower (11%), and other (44%).

***Summary of Threats.*** Threats to the species are linked to habitat disruptions caused by timber harvest and associated road development, livestock grazing, mining, dams,

hydro-electric development, and irrigation diversions (USFS 1994). Introduction of exotic species has impacted bull trout populations through competitive interaction, predation, and hybridization (Rieman and McIntyre 1993). Bull trout populations have also suffered from historical overharvest.

Bull trout endangerment is caused by each of the five factors in the ESA (§ 4(a)(1)) as follows:

(A) *Present or threatened destruction, modification, or curtailment of habitat or range.*—The patchy distribution of bull trout in relation to other salmonid species suggests that bull trout have relatively specific habitat requirements. Stream channel conditions are particularly important for bull trout. Any disruption in important habitat characteristics should be considered a threat to the persistence of a bull trout population.

Bull trout have very specific habitat requirements. Species with specific requirements are likely more sensitive to habitat change and less able to persist in the face of change (Rothschild and DiNardo 1987). Although bull trout may be present throughout large river basins, spawning and rearing fish are often found only in a portion of available stream reaches (Weaver and Fraley 1991). Channel and hydrologic stability, substrate, cover (complexity), temperature, and the presence of migration corridors consistently appear to influence bull trout distribution or abundance (Ziller 1992):

*Channel Stability.*—The association with substrate appears more important for bull trout than for other species (Nakano et al. 1992, Pratt 1984). Young bull trout are closely associated with stream channel substrates. The extended tie to substrate and the presence of embryos and alevins in the substrate during winter and spring suggests that highly variable stream flows, bedload movements, and channel instability influence the survival of young bull trout (Goetz 1989). A lack of habitat complexity, the frequency of bedload scour, and the frequency of low flows are aggravated by watershed disruption and problems of channel instability in many bull trout streams.

*Substrate Composition.*—Increased sediments reduce interstitial space, and cause channels to braid. Recent work (Weaver and Fraley 1991) indicated that any increase in

fine sediments reduces survival of bull trout. Success of embryo survival, fry emergence, and overwinter survival are considered important mechanisms.

*Cover.*—Bull trout are usually associated with complex forms of cover and with pools. Strong bull trout populations will require high stream channel complexity (e.g., in-channel wood, undercut banks, etc) which provides cover and contributes to growth, survival, and stability of other salmonids populations as well.

*Temperature.*—Temperature represents a critical habitat characteristic. Increased temperature will likely exacerbate fragmentation of bull trout populations. Temperature changes also increase the risks of invasion by other species that may displace bull trout (Mullan et al. 1992). Optimum temperatures for rearing are believed to be about 7 to 8° C (Goetz 1989), for incubation are between 2 and 4° C (McPhail and Murray 1979), and those in excess of 15° C are thought to limit bull trout distribution (Fraley and Shepard 1989).

*Migratory Corridors.*—Migratory corridors tie safe wintering areas to summer or foraging areas. Movement is important to the persistence and interaction of local populations. Disruption of migratory corridors will increase stress and reduce growth and survival. (Ziller 1992).

(B) *Overutilization for commercial, sporting, scientific, or educational purposes.*—Bull trout spawners are particularly vulnerable to poaching because they often move into small tributaries several months prior to spawning and congregate in pools. The IDFG has declared all waters in the state closed to bull trout harvest except for Lake Pend Oreille and the lower Clark Fork River.

(C) *Disease, predation, or competition.*—Interactions with introduced non-native fishes (e.g. brook trout) through competition, predation and hybridization may decrease the likelihood that some bull trout populations will persist.

(D) *Absence of regulating mechanisms adequate to prevent decline of the species or degradation of their habitat.*—Although regulatory mechanism that would protect bull trout and their habitats exist at both the federal and state level—for example, fishing regulations, IDEQ guidelines, NFMA, ESA

candidate conservation efforts—the rules, interpretation, and lack of implementation of these mechanisms may not provide adequate protection for bull trout and their habitats.

(E) *Other natural or manmade factors affecting the species continued existence.*—Supplementation of wild bull trout stocks with hatchery bull trout may be harmful by altering or reducing genetic diversity.

### **Bull Trout Conservation Strategy (CS)**

The Conservation Strategy developed in Idaho (IDFG et al. 1995) relies on ecosystem and conservation biology concepts developed elsewhere (Frissell 1993, Rieman and McIntyre 1993, PACFISH 1994, and FEMAT 1993). The strategy seeks to address bull trout recovery by maintaining and restoring the ecological processes that create and maintain good fish habitat. The restoration strategy is further refined by stratification of drainages within key watersheds (Frissell 1993). Watershed-Fisheries Evaluation in the strategy is based on the watershed analysis approach suggested in FEMAT (1993). The Conservation Strategy provides a conceptual overview of key points and terminology incorporated in the plan and presented the following subsection.

**Goals.** The goal of the Bull Trout Conservation Strategy is to:

Maintain and/or restore healthy and viable bull trout populations with the multiple life history strategies and the spatial and genetic diversity of bull trout populations and ensure long-term persistence throughout their natural range in Idaho. (IDFG et al. 1995).

Supporting goals of the Conservation Strategy are:

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features necessary to ensure protection and restoration of the aquatic systems.
2. Maintain and restore spatial and temporal connectivity within and between watersheds.
3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.
4. Maintain and restore ground water and surface water quality necessary to support healthy riparian, aquatic, and wetland

ecosystems.

5. Maintain and restore the sediment regime in which the aquatic ecosystem evolved.
6. Maintain and restore ground water and in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.
7. Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands.
8. Maintain and restore bull trout population and genetic integrity where interactions with exotics threaten population persistence. (IDFG et al. 1995)

**Approval.** The Idaho Fish and Game Commission approved the Bull Trout Conservation Strategy on January 20, 1995. It is the responsibility of the federal agencies to move beyond the Conservation Strategy stage to push for a Conservation Agreement (A. Thomas, review comments).

According to Feldman (review comments), the initial Bull Trout Conservation Strategy was an attempt at a statewide partnership between state (IDFG and IDPR) and federal (FWS, BLM, and USFS) agencies. These partnership possibilities also lie at the county and local city government level. For example, Lemhi County is negotiating with the FWS and NMFS on a Conservation Agreement on bull trout and salmon habitat (M. Feldman, review comments).

### **Towards a Bull Trout Conservation Agreement (CA)**

As a state-approved Conservation Strategy, the next step for bull trout is formulation of Conservation Agreements to implement the strategy. This involves the concept of key watersheds, Watershed Analysis, and several other technical considerations. Political considerations also need to be considered, as this section indicates. Otherwise, successful cooperative partnerships will remain elusive.

**Watershed Analysis.** Riparian/Aquatic Habitat Management Objectives (RMOs) are quantifiable measures of site-specific stream and stream-side condition that define good bull trout habitat, and serve as indicators against



which attainment, or progress toward attainment of Bull Trout Conservation Strategy goals will be measured. Key watersheds are those that have been designated as critical to the long-term persistence of regionally important bull trout populations. They define the land area where management actions emphasize the maintenance or recovery of bull trout. Key watersheds are designated on the basis of bull trout population biology and not land ownership. Rieman and McIntyre's (1993) conservation approach concentrates on the establishment of "core areas" distributed throughout the range of the species. Key watersheds are synonymous with "core areas" and five criteria to identify these were presented earlier.

Riparian Habitat Conservation Areas (RHCAs) were described by the FEMAT Scientific Analysis Team (Thomas et al. 1993) as "portions of a watershed that contribute to the creation and maintenance of fish habitat." RHCAs include riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological functioning is crucial to maintenance of the streams waters, sediment, woody debris and nutrient delivery systems (PACFISH 1994).

Watershed Fisheries Evaluation is ecosystem planning at both the key watershed and drainage scales. The products guide and prioritize management actions to achieve the Bull Trout Conservation strategy goals. The specific products include: appropriate boundaries for RHCAs, values for RMOS, site-specific standards and guidelines for land uses within RHCAs, where and when restoration activities would be most effective, and designation of appropriate monitoring parameters.

A successful monitoring strategy for bull trout should provide information to show whether or not bull trout persist in key watersheds (Rieman and McIntyre 1993). The monitoring efforts include: 1) population distribution and status, such as presence/absence and baseline condition; 2) effectiveness of the Bull Trout Standards and Guidelines, RMOs, RCHAs, such as implementation, compliance, and habitat response; and 3) effectiveness of restoration efforts, including population response.

Following a presentation on Watershed Analysis at the bull trout science and policy conference at the Andrus Center for Public Policy in June 1995, Dale McGreer (1995) responded by stating that a principal problem with Watershed Analysis is federal agencies do not have clearly defined objectives or reasons for doing Watershed Analysis. This does not have to occur, but it is happening. McGreer suggested well-defined approaches like that in the state of Washington.

Dr. Chris Frissell (1995, p. 52) said, "Don't hang your hats on watershed analysis to bail you out of the basic problem with bull trout conservation. It may help in some cases, ... but it's not going to resolve the basic questions."

**Science and Policy.** The basic question in bull trout conservation is habitat management, and it raises the issue of the role of science in land and resource management policy decisions.

In reference to bull trout, Dr. Bruce Rieman put it this way:

It ought to be clear to a lot of people that there is a lot of uncertainty and ambiguity in science. What managers and biologists are continually forced to do is try to play this game of environmental brinkmanship. How far can we push the system? Where is the threshold? Where is the edge beyond which we can't go? And we don't know where that is.... We keep pushing for this ecological solution, which we just don't have. (Rieman 1995, p. 53).

Again in reference to bull trout, Dr. Chris Frissell said,

[S]cience, as it exists now and as it's likely to occur in the next 10 years, is not going to save us. It can help, and it can help reduce the impact we're going to have on bull trout, but it is not going to tell us how we can keep maintaining early 1980s timber supply and grazing allotment stocking and have lots of bull trout... (Frissell 1995, p. 55).

Both Drs. Rieman and Frissell stopped short of saying that if science cannot fully address conservation questions, then politics must, but that seemed to be the intention of their comments.

**Politics and Policy.** Referring to the *Pacific Rivers* lawsuit and injunction in Idaho (see

Appendix B), Tom France, a Montana-based staff attorney with the National Wildlife Federation said,

As a lawyer, I thought it was an inappropriate strategy. As a politician, I think it probably set back endangered species recovery in Idaho a bit. It certainly polarized the issues in ways that I would most often choose not to, but it had an electrifying effect on bull trout recovery. The Forest Service had been saying for 12 months, "Geez, we can't do this," or "It's going to take a long time," or, "It's a big battleship; it takes us a long time to turn it." Suddenly, the agency saw that it better turn and turn in a hurry. Lo and behold, in about six weeks, we had an inland-fish strategy coming out of the Forest Service. We've done in three months what the agency has heretofore proven that it had no ability to do in three years. (France 1995, p. 61).

The inland-fish strategy France referred to is now widely known as INFISH. This interim management strategy for bull trout and other non-anadromous native fisheries in the Pacific Northwest was agreed upon by three regional foresters on July 28, 1995 (USFS 1995).

To implement an effective bull conservation plan, France (1995) said he had reservations about using the usual public involvement process because he has seen too many agendas in that kind of venue. Instead, he preferred a technical assistance approach where fisheries improvement and land management techniques are made available to land owners. By providing support and incentives as well as a menu of choices, the debate is focused on private actions rather than public debate (France 1995).

France (1995) regretted on the one hand that the ESA was used as an "enormous club" held over the head of the USFS in the case of salmon, but that has worked out well for bull trout. He said the ESA has proven to be a powerful force that, in his opinion, has positive effects in that it "can serve as a vehicle for problem-solving" (France 1995, p. 62), as it has in bull trout conservation efforts led by Montana's governor (see Racicot 1995), in the USFS INFISH effort, and in former Governor Andrus' efforts to put together the pieces of the bull trout puzzle in Idaho (France 1995).

**Listing Controversy Revisited.** In February 1995, the "warranted but precluded" ruling and priority 9 ranking made by the FWS in June 1994 for the bull trout surfaced in the center of controversy and confusion once again. The FWS status review team recommended in February 1994 that the bull trout be made a "priority 2" species on a scale of 1 to 12, and placed it in the "high" and "imminent" threat category (Sonner 1995a). The Associated Press cited existence of memos from members of the original status review team recommending a priority 2 ranking. The subsequent ruling of the FWS of "warranted but precluded" status and priority ranking of 9, with low to moderate threat, was unusual in that it may have discounted the concerns of the scientists who completed the review (Sonner 1995b). A recent memo from the FWS regional director stated that findings by a new review team indicate that 1) bull trout populations are declining, 2) the majority of the remaining populations of bull trout are subject to threats, and 3) efforts to help the fish so far have not been sufficient to prevent past or ongoing habitat degradation and population decline and fragmentation. The memo stated that the priority category for bull trout would be changed to a 3, with high threat status (Sonner 1995a). The new population review was used in June 1995 on the decision to leave the bull trout status as "warranted but precluded," with a priority category of 9 (Associated Press 1995f).

**What's Next in Idaho?** On January 20, 1995, the Idaho Fish and Game Commission adopted as policy the Assessment and Conservation Strategy for Bull Trout. The Commission adopted the policy with the understanding that it was dynamic and subject to change as new information became available. Idaho-based industry had not given support to the new policy because they had not been included in the initial steps of the Idaho Conservation Effort. Subsequent to adoption of the Bull Trout Conservation Strategy, personnel from the IDFG, the USFS and the BLM met with forest industry resource staff and made minor revisions to the policy. Moving the federal PACFISH standards and guides from the body of the policy to an appendix was the most

significant alteration.

The FWS acknowledged Idaho's efforts in the bull trout conservation strategy, stating that it has laid a lot of framework but there has been little action on the ground. There is skepticism that since the Conservation Agreement (CA) process is voluntary and agencies and private landowners are not required to write CAs to implement the conservation strategy, that the inevitable listing has only been delayed. The Idaho Conservation Effort (see Question 8) now seems to have switched back to a federal effort. In March 1995, scientists from the USFS, FWS, and BLM met to discuss a drafting of interim rules for protecting the bull trout. These rules are similar to the FEMAT/PACFISH approach adopted for salmon streams in the West (see Appendix B). The Columbia Basin Ecosystem Management Project is now responsible for writing the interim rules, referred to as the Inland Native Fish Strategy. An environmental assessment for INFISH, was approved on July 28, 1995 (USFS 1995), and the interim rules will be in place until environmental impact statements are completed under the Columbia Basin Project. This will cover federal lands.

What about non-federal lands? The states of Montana (Racicot 1995, France 1995) and Idaho are working toward effective bull trout conservation without the ESA. Will Reid (1995), of the Idaho Department of Fish and Game, described the conservation strategy effort in Idaho:

[I]t took us 30 days to come up with this strategy. It's a strategy that's based on biology. It was a strategy that was developed under a perceived sense of urgency, a realization that we had to do something. We had to do something immediately to demonstrate that threats to bull trout are, were, and can be removed. It was designed to prevent another listing of another Northwest species, to prevent another train wreck....

I must emphasize that the strategy portion is an ecosystem approach. It pertains strictly to bull trout, and it doesn't mandate anything. It offers some guidelines. It tells you once and for all what the biology of the critter is and what it needs for persistence, and it asks for a land manager's assistance. It states strongly the need for local application....

[Y]ou should be taking the least risk in those systems that are currently in the best shape. You should be placing your focus on those systems. You should maintain those systems for their ability to refound other populations that have been degraded for one reason or another. Those should be your primary focus....

We stressed that the local application is key, that the strategy defines biology, and that it begs... for the trust that we are trying to do the right thing. (Reid 1995, p. 66-67).

Jerry Conley (1995), the Director of the Idaho Department of Fish and Game, presented his feelings about the Idaho approach, confirming some of Reid's points, and describing the relationship of the Idaho effort to the ESA:

You've heard a lot about how you've got to believe that you can solve problems locally. He said that you must have coordination, including a strong state lead, and you must have short-term actions. The short-term actions are really important because you've got to get started. You've got to get acquainted. You've got to establish a work relationship, and then the local problems start to be solved. You must also have a long-term strategy. You've got to have a broad viewpoint on it.

Frankly, my own feeling is that the Endangered Species Act works pretty well until the species gets listed. Then at that stage, the micro management comes rolling in with the federal agencies, and it starts to destroy this local approach rather than help it. That's controversial maybe, but that's my own thought. If I were going to do something about the Endangered Species Act, I'd leave it there as a threat, but I'd utilize that threat as some of the speakers have talked about: Work locally, get it done, and never let the ESA kick in. (Conley 1995, p. 67).

Governor Phil Batt (1995) also addressed the importance of the Idaho effort, emphasizing that bull trout conservation is doable, and that state government has a key role:

We have before us today an issue that gives state government a real opportunity to take control. Contrary to the anadromous fish dilemma, which is so complicated and does not lend itself to clear scientific solutions, the bull trout and the other inland fish species do lend themselves to a cause-and-effect examination, which will allow us to apply common sense

solutions a lot more easily than we can in the case of the anadromous fish.

The bull trout conservation strategy adopted by the Fish and Game Commission is a good starting point. The strategy is intended to provide methodologies that could be applied to any inland native species and broadened to include other animals and plants. Based on the direction offered in the state agency, federal, state, and private land managers could then develop site-specific standards and guides. Although there is work to be done on our state conservation strategy, I believe it's in the best interest of the state and of the bull trout to continue in this manner.

In addition to this strategy, there are a number of other activities that allow the state to provide the capacity to manage our inland fisheries. Through the Idaho Forest Practices Act, the Idaho Department of Land has given guidance for such standards and has promulgated rules that protect water quality, fish and wildlife habitat, and forest health.

Our Idaho Division of Environmental Quality is also dedicating itself to this process and has steadily moved toward the development and implementation of standards and guides to ensure long-term protection of beneficial uses. In the last Legislature, we passed an act putting a large part of that responsibility on our DEQ. The feds haven't been totally happy with what we have done, but we are determined that we will reach the goals prescribed to us in that area. (Batt 1995, p. 69).

**Summary.** To recap, in 1992 the U.S. Forest Service commissioned an effort to develop an inter-regional assessment of what is known about bull trout biology and the factors threatening bull trout populations in the West. A petition for listing came in October 1992. The FWS ruled in May 1994, after a long delay, that the bull trout was warranted for listing but precluded at this time because 80 or so other species had a higher priority and need of the resources of the agency for protection. This decision was unusual because the scientists completing the initial status review for the species recommended a priority ranking of 2 for the bull trout, not 9 as the species received.

Why was listing deferred? Perhaps it was

to allow state management agencies to formulate recovery and protection options, as Washington, Montana, and Idaho have said they would do. Perhaps, as some claim, it was a political move, bowing to forest products industry fears of extensive logging cutbacks and related problems that have surfaced with the salmon listing. Or perhaps, as the ESA allows, it is because the FWS already has more work than the agency can handle trying to recover species with a higher priority rating.

Prior to the FWS "warranted but precluded" ruling, a national MOU was signed by the federal agencies to establish a framework for working cooperatively in writing and implementing Conservation Agreements as interim measures to conserve species and prevent the listing of species that appear to be headed toward federal listing. After the bull trout ruling, the federal agencies appear to have backed away from the Conservation Agreement effort for the bull trout, and the state of Idaho took the lead. A state MOU signed in December 1994 established the Idaho Conservation Effort, although the process had already begun in February 1994. A draft bull trout Habitat Conservation Assessment and Conservation Strategy was written and distributed for review in April 1994. The assessment weighed in heavily with reference to the earlier effort by the U.S. Forest Service (USFS 1994), but was essentially moving to a state recommended strategy for implementation on federal and private lands through Conservation Agreements.

The interim INFISH strategy developed by the USFS (1995) will likely be quite similar to the approach taken on federal lands for inland fishing management for native species, including bull trout. Private landowners and state agencies have a Conservation Strategy for bull trout approved by the Idaho Fish and Game Commission in January 1995. The pieces of the bull trout puzzle are now on the table, waiting to be assembled. Many people in Montana and Idaho are hoping that the ESA, which was an effective catalyst for laying the pieces on the table, will not be necessary for putting them together.

## Conclusions

The ESA makes the FWS and NMFS responsible for the conservation of listed species. It appears that the FWS gave the states a chance to implement conservation actions when the Service issued its "warranted but precluded" ruling for the bull trout in May 1994, and again in June 1995.

This should encourage continuing interagency efforts to develop Conservation Strategies and Conservation Agreements under

state agency leadership. According to Trish Klahr of the U.S. Fish and Wildlife Service, the bull trout example "unfortunately, happened to be the first on deck and happened to be a real complicated one" (Loftus 1995c). Whether or not the Idaho Conservation Effort can come up with a solution to the bull trout situation remains a question at this point in time. But that should not discourage efforts to develop Conservation Strategies and Conservation Agreements for other candidate species.

## Appendix D: Case Study—Grizzly Bear

This case example focuses primarily on difficulties in recovery planning, but also illustrates what is likely to happen following delisting, which is significant because two grizzly bear populations are close to attaining recovery goals and being delisted (MacCracken et al. 1994). A district court ruling in October 1995 on the grizzly bear recovery plan, however, has put those recovery goals and the prospects for delisting into question.

Other ESA issues are also illustrated. The use of ESA flexibility in the take "special rule" provision (ESA § 4(d)) is briefly mentioned, and illustrates the difference between threatened and endangered status. An ecosystem-level approach to grizzly bears illustrates problems with such an approach.

The areas of habitat available for grizzly bears in northern Idaho are small in relationship to what a viable population of bears may need. This brings the ESA issue of recovery as the ultimate purpose of the ESA into question. As an alternative, MacCracken et al. (1994) considered that perhaps the ESA should be flexible enough to allow protecting bears in these areas, and forget about trying to establish a viable population.

In the end, cooperative partnerships to ensure certain areas are undisturbed when bears need them seems to be a workable approach for successfully blending grizzly bear needs with human desires. The two can co-exist, as we have learned in Idaho.

### Recovery Plan Controversies

Success under the ESA involves the linkage of habitat with conservation actions to mitigate factors causing endangerment and achieve species recovery goals. This is what ESA is all about! There are many issues associated with recovery plan development and implementation that can be illustrated with grizzly bear recovery in Idaho. Most of the material in this section is from a previous PAG report (MacCracken et al. 1994).

**Public Attitudes.** Grizzly bear recovery is an example of controversy. Plans are controversial because they must be specific.

They are too specific for some people, and not specific enough for others. The grizzly bear recovery plan is controversial, because it involves large preserves for "secure" habitat, linkage corridors, and delisting strategies. One reason the ESA faces attack during reauthorization is that there are very few ESA success stories. As Bean (1991) pointed out, the status of about 60 listed species has been improved. He cited 18 species that have either been taken off the list because they have recovered or their status has been improved from endangered to threatened. Grizzly bear recovery could be a great ESA success story that reauthorization proponents could emphasize. In the case of two grizzly bear populations—Yellowstone and Northern Continental Divide—momentum appears to be building to make this short-term success story a reality, despite considerable disagreement offered by some sectors of the public and the scientific community. For some, the grizzly bear is a powerful symbol of wild lands and wilderness, and some advocates for expansion of the National Wilderness Preservation System may resist attempts to delist grizzly bears. Delisting does not mean lack of protection for grizzly bears, as state agencies would assume the role of protector that federal agencies now perform.

Some people do not believe that the grizzly bear recovery plan (US-FWS 1993a) is adequate to promote grizzly bear recovery, especially over the long-term (Shaffer 1992). In December 1993, at the IGBC meeting in Denver, Colorado, a coalition of environmental groups presented a copy of a letter sent to Secretary of the Interior Bruce Babbitt, suggesting that the plan be withdrawn and a completely new plan be developed (J.G. MacCracken, personal observation). Those environmental groups felt that the plan does not designate large enough recovery areas and high enough population goals, that the monitoring methods are not proven, and that the plan does not contain any standards for habitat protection. In general, these concerns center around the needs of grizzly bears to insure long-term survival for more than 100 years. However, there are other conservation groups that generally support the plan, recognizing that refinements will be made as

more information is gathered (H. Fischer, pers. comm.).

On the other side of the issue are those that oppose the recovery plan because they oppose grizzly bear recovery outright, or feel that the plan is too restrictive (US-FWS 1993a). The FWS received 2,113 comments on the 1992 draft recovery plan revision. About one-half of the comments were general statements either for or against the plan. Of these 1,030 general comments, 65% were in support of the plan or felt that it required more stringent guidelines, the other 35% were opposed to the plan or felt it was too restrictive (US-FWS 1993a). Much of the opposition to the plan centered on the presumed negative impacts of grizzly bear recovery to local economies. Also of concern was the possibility that the government may purchase private property from willing sellers and that road density standards were too low.

The other half of the public comments on the draft revision were more specific, such as on the size of the recovery zones, the need for habitat linkages, road density standards, etc. These comments could not be easily interpreted as either supporting or not supporting grizzly bear recovery (US-FWS 1993a).

**Scientific Debate.** The recovery plan is also highly controversial within the scientific community. Twenty biologists, led by Mark Shaffer (1994) of the Wilderness Society, wrote Secretary of the Interior Bruce Babbitt and FWS Director Mollie Beattie in January 1994 requesting the plan be withdrawn and revised. These scientists suggested that the plan lacked scientific credibility, established inadequate recovery criteria, used unproven population monitoring methods, and did little to provide effective and quality habitat for grizzly bears. They also noted that none of the four factors that led to the initial 1975 listing has improved and that the plan did nothing to improve them.

In response to that letter, another group of 25 scientists led by Professor Hal Salwasser (1994) of the University of Montana also wrote to the Secretary and Director in February 1994 expressing support for the plan. They cited decreased human-caused

mortalities, recent population increases, and progress on habitat protection as positive accomplishments that the revised plan would build on. They also emphasized the progress in efforts to restore grizzlies to the Bitterroot and North Cascades Ecosystems, and suggested that studies of habitat linkage zones as outlined in the plan should also proceed without delay. Apparently, restoration of grizzlies to the Bitterroot and North Cascades Ecosystems is contingent upon approval of those chapters of the recovery plan and the recovery plan as a whole, since recovery efforts cannot proceed without an approved plan.

It should be kept in mind that the 1993 recovery plan is a revision of the 1982 plan, and is a relatively short-term planning document that will be reviewed and possibly revised every five years (US-FWS 1993a). Given this planning time frame, some people suggest that concerns for the status of grizzly bear populations 100 to 1,000 years from now are beyond the scope of the current recovery planning effort. The counter argument is that the future of the species will be determined in the near-term because if opportunities to meet long-term goals are not considered now, they may be lost forever. Because these concerns are common to all ESA recovery plans, Scott et al. (1995) suggested that recovery planning take a two-tiered approach, with long-term and short-term goals formulated in the plan and current social and economic constraints identified.

In October 1995 the U.S. District Court agreed with the environmental group plaintiffs who filed suit alleging that the grizzly bear recovery plan violated the ESA. Habitat protection, regulatory measures, and census methods were found to be inadequate, and the FWS was given 90 days to reconsider those portions of the plan (Associated Press 1995h).

### Barriers to Recovery

There are important barriers to grizzly bear recovery that are not directly related to the causes for listing species under the ESA. The analysis in MacCracken et al. (1994) identified several barriers that can be lumped into five categories: scientific, management, legal,

value/cultural, and institutional. They were analyzed in the context of grizzly bear recovery. These same barriers to grizzly bear recovery will likely apply in some degree to all ESA recovery efforts.

Clark et al. (1994) provided many examples of recovery efforts that illustrate these barriers to recovery, as well as ways to overcome them. If you are interested in the recovery process and barriers to success, you should read Clark et al. (1994) for illustrative examples.

One barrier that is often mentioned in the case of grizzly bears is what happens when the recovery goal is attained. The answer is delisting, and it raises the issue of actions that will keep the grizzly bear from having to be relisted. This issue clouds the success of recovery programs. The grizzly bear situation is therefore instructive, especially because it centers on a state-based conservation strategy.

**Management Following Delisting.**—Once a species is listed, the ESA requires the FWS to recover and delist the species. Delisting may not however, provide much regulatory relief because one of the requirements for delisting a grizzly population is the approval of an interagency conservation strategy to guide management following delisting (US-FWS 1993a). The FWS does not want to have to relist a species.

The grizzly bear populations in the Northern Continental Divide and Yellowstone Ecosystems are close to meeting the population goals for delisting (US-FWS 1993a). The remainder of this section describes the strategy for management that will follow delisting in the Northern Continental Divide Ecosystem, if and when it occurs.

A draft conservation strategy for the Northern Continental Divide Ecosystem was released in May 1990; a draft strategy for the Yellowstone Ecosystem will probably be completed within the next two years. The Northern Continental Divide draft strategy provides some insights into how grizzly bears may be managed following delisting (Montana Department of Fish, Wildlife, and Parks 1990).

One assumption is that once delisted, grizzly bear populations would be under the jurisdiction of state wildlife management

agencies. This assumption does not appear to be entirely true. For example, although the Northern Continental Divide Ecosystem is wholly within Montana, the draft strategy establishes a management committee of 10 signatories from a variety of federal, state, and tribal agencies. Although there are numerous laws and regulations providing authority for the involvement of the various agencies, the primary incentive to enforce the strategy is the requirement that the agreement be in effect before delisting can occur. The potential for emergency relisting under the ESA if the population and habitat declines is also an incentive to enforce the strategy. If and when the population is delisted, a new Northern Continental Divide Ecosystem Management Committee will be assembled. It is to be composed of high-level administrators from state, tribal, and federal agencies as well as members-at-large from Canadian government agencies and firms owning industrial timberlands. This committee will assume the functions of the IGBC, and report to the Director and the Commission of the Montana Department of Fish, Wildlife, and Parks.

Grizzly bear habitat management under the draft strategy largely remains the domain of the U.S. Forest Service and National Park Service. The Montana Department of Fish, Wildlife, and Parks will develop plans for monitoring grizzly bear populations and habitat using a cumulative effects model. Population trends will continue to be assessed using counts of females with cubs, distribution of those females among BMUs, and limits for annual human-caused mortalities. Guidelines will be set to trigger emergency relisting under the ESA if estimates of these indicators fall below specified levels.

The draft strategy suggests that the state will eventually divide the ecosystem into management zones. At present, however, the draft strategy does not change the current management zones, called situation 1, 2, and 3 designations. In addition, the draft strategy defers to agency and tribal land use management plans in implementing resource-use activities. The draft strategy also adopts the guidelines of the Montana Department of Lands for grizzly bear management on state lands and sets objectives for cooperation with



private and tribal lands within grizzly habitat. Two tribes have lands in the area: the Blackfeet and Confederated Salish and Kootenai Tribes. Both have responsibility for grizzly bear management on their lands.

The draft strategy replaces the ESA section 7 consultation requirements with a less stringent consultation requirement. The consultation will be similar to the process used in meeting ESA mandates for candidate species. The consultations will be advisory in nature and are not intended to prohibit projects on public lands, but to insure that those projects do not result in a relisting of the population.

In summary, it appears that the interagency conservation strategy for the Northern Continental Divide Ecosystem will keep in place many of the regulations and guidelines that currently operate to effect grizzly bear conservation under the ESA. The ultimate authority however, will shift from the IGBC and the FWS to a new Northern Continental Divide Ecosystem Management Committee and the Montana Department of Fish, Wildlife, and Parks Director and Commission. Except for consultation with Indian tribes, interagency consultations will become a state process that is solely advisory in nature. The potential relisting of the population under the ESA and return to federal control if the population and habitat indicators fall below specified levels are the primary incentives to comply with the strategy.

This strategy is currently being revised. The Northern Continental Divide Ecosystem Management Subcommittee of the IGBC expects to complete the final interagency conservation strategy before the end of 1995. Presumably, conservation strategies for other ecosystems will be very similar to the one being developed for the Northern Continental Divide Ecosystem.

### **Other Conservation Issues**

This section briefly covers several unrelated issues in grizzly bear conservation or recovery. They include threatened versus endangered status, ecosystem-level protection, a protection versus recovery strategy, and a cooperative partnership approach.

**Threatened versus Endangered Status.** The prohibition against taking the species applies not only to federal agencies but also to "any person subject to the jurisdiction of the United States" (ESA § 9(a)(1)). While the section 9 taking prohibition applies only to endangered species, section 4(d) of the Act authorizes the Secretary to impose the same prohibitions to protect species listed as threatened. Under this delegation of authority, the Secretary has authorized a general rule applying the section 9 prohibitions to threatened as well as endangered species unless a regulation is adopted specifically exempting the threatened species (50 CFR § 17.31 [1992]). For example, the FWS has adopted special provisions applicable to the taking of grizzly bears (50 CFR § 17.40(b)(1)(i)(B)-(F) [1992]).

In the case of grizzly bears, this may be most pertinent to populations in Montana and Wyoming where state regulations list them as a game species. Montana has allowed a limited hunting season for grizzly bears (Jacobsen 1980, US-FWS 1982, Dood and Pac 1993) which was terminated in August 1992 to comply with a judicial decision (*Fund for Animals, Inc. v. Turner*, 1991 WL 806232 [D.D.C. 1991]). In Idaho, the grizzly bear came under *de facto* protection in 1947 when it was no longer classified as a game animal. It is currently included on the state's threatened or endangered species list (Knick and Kasworm 1989, US-FWS 1993a).

In 1992, the FWS considered a reclassification of the Cabinet/Yaak grizzly population from threatened to endangered. The FWS ruled the reclassification "warranted but precluded." An October 1995 court decision found the FWS' ruling illegal because the FWS did not show that it was actively working on listing other species. The Selkirk population was subject to similar ruling (Associated Press 1995h).

A reclassification of grizzly bears from threatened to endangered would not significantly increase protection of the species because management programs and guidelines will likely remain the same under the ESA, and civil penalties are the same for both under the ESA. However, reclassification would require the designation of critical habitat. Some of the reluctance of the FWS to change

the status of grizzly bears from threatened to endangered may also be related to the subsequent requirement to designate critical habitat and prepare an environmental impact statement as part of that process (Kuehl 1993).

**Ecosystem-level Protection.** Under an ecosystem-based management approach, grizzly bears could be viewed as an umbrella species (Noss 1991) whereby management for grizzlies would also benefit other species. However, those relationships have not been defined or documented. Alternatively, comparisons of the ecological needs of the listed and candidate species in an area may lead to the identification and management of an optimum mix of species (W. Melquist, pers. comm.). Because some species may compete for space and food and some are predators and others prey, not all species will be accommodated at all times. For example, it may not be possible to recover grizzly bears, wolves, and woodland caribou in the Selkirk Ecosystem in northern Idaho.

Under the ecosystem management approach, a biodiversity reserve system with connected core areas is envisioned, serving as a protected refuge for species such as grizzlies that require limited human access or undeveloped areas (Noss 1992, McEuen 1993). If a classic metapopulation structure can be achieved under such a reserve system, local extinctions of listed species may no longer be as great a concern as currently perceived. Although Harrison (1994) criticized metapopulation theory and conservation planning, the core refuge idea appears to have merit in the case of grizzly bears. The ecosystems in which the two grizzly populations are apparently increasing, Yellowstone and Northern Continental Divide, have land-use designations that could be described as a core refuge—specifically Yellowstone and Glacier National Parks. Intensively developed lands around the two parks are mitigated to some extent by a number of adjacent or relatively close wilderness areas serving as buffer zones. In contrast, both the Cabinet/Yaak and Selkirk Ecosystems lack a national park and only the Cabinet/Yaak Ecosystem has a designated wilderness area. However, in the Selkirk Ecosystem there are several roadless areas,

some of which are being managed to maintain their wilderness attributes, thus are *de facto* wilderness areas.

**Protection versus Recovery.** The approach currently practiced attempts to increase small grizzly populations by reducing human-caused mortality and setting recovery goals at levels consistent with available habitat. This does not seem to be working in the Selkirk or Cabinet/Yaak Ecosystems. The ESA currently requires agencies to recover listed species, not just protect them. The Act could be amended to recognize that some small, isolated populations currently cannot be recovered, but are nonetheless worthy of protection. The agencies could therefore protect these animals without attempting to recover them. As Rohlf (1989) stated, this alternative would preclude these small populations from recovery planning, and would thus favor concentrating limited resources on populations where adequate habitat currently is available and the achievement of recovery goals is more feasible. On the other hand, recovering population segments independently may foster the perception that recovery efforts lack coordination and may create confusion and frustration when some populations are delisted and others are not. In part, these potential problems reflect the lack of explanation and justification in the revised grizzly bear recovery plan (US-FWS 1993a) for the focus on six distinct population segments in contrast to the recovery requirements of the original plan (US-FWS 1982).

**Cooperative Partnership Approach.**

Connecting fragmented grizzly habitats with ecosystem linkages will require some creative cooperative mechanisms between public agencies and private landowners, such as some type of incentive system. Several interest groups are actively working on incentive-based systems to encourage private landowners to participate in ecosystem management and thus avoid potential property takings problems. These groups include the Defenders of Wildlife (see Hudson 1993) and American Forests (see Sample 1994).

In the case of grizzly bears, one of the most important factors is human-caused mortality.

It is possible to reduce this factor to a level where the species can recover. Methods to do that involve providing adequate secure habitat for bears, which means hiding cover and limited road access to grizzly habitat.

The attempt to establish ecosystem linkages between recovery areas and the need to reduce human-caused mortality both require interaction between federal land and resource management agencies and their neighbors. The success of the partnership effort in Louisiana black bear recovery (see case study of flexibility in Question 12) perhaps offers some different ways of thinking about grizzly bear recovery. Getting people together to talk about what they want and how to accommodate those desires is what a partnership is all about. An ecosystem-based approach to species conservation and landscape-level land management will require effective partnerships. Why not start now? The Interagency Grizzly Bear Committee would be a good place. State and federal agencies work together, and two grizzly bear populations (neither one in Idaho) are close to delisting. Why hasn't the IGBC been able to claim success in Idaho?

Specific to grizzly bear recovery, the current course is embodied in the 1993 revision of the grizzly bear recovery plan. As noted, the plan is controversial among scientists and interest groups. To some, changing the current course would involve designating larger recovery zones, setting higher population goals for recovery, providing connectivity among the grizzly bear ecosystems, requiring more stringent habitat protection standards, and establishing an international treaty to help recover populations that range into Canada (Shaffer 1992). From a theoretical standpoint, these actions would

greatly enhance the success of recovery programs and probably hasten the recovery process. However, there is a great deal of biological and political uncertainty associated with this approach that makes abandoning the current course and moving in this direction risky. As viable population analysis methods are refined and tested, metapopulation structures elucidated, habitat linkages evaluated, and baseline data on grizzly demographics, habitat selection, and estimates of the carrying capacity of the recovery zones gathered, these concerns can be incorporated into future revisions of the recovery plan. To others, changing the current course involves movement in the opposite direction, with delisting and less intrusion of federal biologists into land-use decisions that affect resource-dependent communities.

### Conclusions

The choice seems to be one of continuing the controversy and conflict versus cooperation to meet the needs of bears without taking human land and resource use out of the picture. Recovery of the grizzly bear in the lower 48 states represents one of the major challenges faced by the ESA. The grizzly bear needs large areas of relatively undisturbed habitat during different seasons. It tolerates little contact with humans, and when confronted with humans, it is unpredictable and very dangerous.

Experience has shown that humans and grizzly bears can co-exist, if humans are willing to accommodate the bear. The grizzly bear can be an ESA success story, by using the flexibility in the ESA and developing a cooperative partnership approach to conservation.

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## GLOSSARY

(Note: Terms in **boldface** within the definitions are also defined elsewhere in the Glossary.)

- Aesthetics (esthetics).** Evaluations and considerations concerned with the sensory qualities of resources (sight, sound, smell, taste, and touch) and especially with respect to judgment about their pleasurable qualities. See **values**.
- Anadromous fish.** Species of fish that ascend rivers from the ocean to breed.
- Anthropocentric.** Considering humans as the most significant entities on earth; interpreting or regarding the world in terms of human **values** and experiences. Cf. **ecocentric**.
- Bear management unit (BMU).** Approximate 100 square mile areas of each grizzly bear **recovery zone** that contain all the resources necessary to meet the annual needs of a grizzly, and are the spatial context in which management programs are applied.
- Biodiversity (biological diversity).** The variety of life and its processes at genetic, individual, **population, species, community and ecosystem scales**.
- Biological assessment.** A document prepared by a federal agency proposing an activity in the **habitat** of a listed species. During the ESA section 7 **consultation** process, federal agencies proposing an action must ask the FWS if a **threatened or endangered species** is in the area of the proposed action. If such **species** may be present, the action agency "shall conduct a biological assessment for the purpose of identifying any **endangered species or threatened species** which is likely to be affected by such action" (ESA § 7(c)(1)).
- Biological evaluation.** See **biological assessment**, which is often synonymous. The U.S. Forest Service uses a biological evaluation in reference to **candidate or sensitive species**.
- Biological opinion.** A document prepared by the U.S. Fish and Wildlife Service, as part of a formal **consultation**, as a review of a **biological assessment or biological evaluation** in which a **jeopardy** or no-jeopardy, and possibly an **incidental take** finding is declared. The Endangered Species Act requires that promptly after conclusion of **consultation**, the FWS shall provide a written statement setting forth the opinion as to whether a proposed action will **jeopardize an endangered or threatened species** or adversely modify its **critical habitat**. If a **jeopardy** or adverse modification is found, the FWS shall suggest **reasonable and prudent alternatives** the action agency can take (ESA § 7(b)(3)(A)).
- Buffer (buffer zones, buffer strips).** Something that serves as a protective barrier; in areas where timber is harvested, the trees in **buffer strips or zones** adjacent to streams often are left uncut in order to protect streams and **riparian areas or threatened or endangered species**.
- Bureau of Land Management (BLM).** The federal agency within the Department of Interior that administers the public lands which are located primarily in the western states and which amount to about 48 percent (over 272 million acres) of all federally owned lands.

**Candidate species.** The U.S. Fish and Wildlife Service (FWS) maintains lists of rare **species**, some of which are candidates for listing, and all of which deserve considerations in land-use decisions (Coggins 1994). The two highest categories of candidate **species** are C-1, for which the FWS has information indicating listing is likely and appropriate; and C-2 **species**, for which the FWS has information indicating review is warranted. See also **warranted but precluded**.

**Conservation (conserve, conserving).** "To use and the use of all methods and procedures which are necessary to bring any **endangered species** or **threatened species** to the point at which the measures provided pursuant to this Act are no longer necessary" (ESA § 3(3)).

**Conservation agreement (CA).** A formal written document agree to by participating agencies to achieve the **conservation** of **candidate species** through voluntary cooperation. It documents the specific actions and responsibilities for which pertinent parties voluntarily agree to be accountable. The objective of the CA is to reduce threats to a **candidate species** and/or its **habitat** (US-FWS 1994a).

**Conservation biology.** A mission-oriented discipline that focuses on the conservation of the natural world and is tied to biological disciplines ranging from the molecular to the **population** level, but draws also from natural resource management disciplines, the social sciences, and the humanities.

**Conservation measures.** Actions that are suggested as part of a **biological assessment** or **biological evaluation** of a proposed project that will help to **mitigate** those effects of the project on a **listed species**, e.g., requiring that loggers operating in grizzly habitat not bring firearms into the area.

**Conservation strategy (CS).** A management plan for a **species**, group of **species**, or **ecosystem** that prescribes standards and guidelines that if implemented provide a high likelihood that the **species**, groups of **species**, or **ecosystem**, with its full complement of **species** and processes, will continue to exist well-distributed throughout a **planning area**, i.e., a **viable population**. The objective of a CS is to provide a strategy for reducing or eliminating threats to plants and animal **species**, stabilizing **habitats**, and restoring and maintaining **populations** and their **habitats**. (W. Reid, review comments).

**Consultation (interagency).** A process required by section 7 of the Endangered Species Act whereby federal agencies proposing activities in a **listed species habitat** confer with the U.S. Fish and Wildlife Service (or the National Marine Fisheries Service) about the impacts of the activity on the **species**. Consultations may be informal, and thus advisory, or formal, and thus binding.

**Cooperative Agreement.** An agreement that the Service can enter into with any State that establishes and maintains an adequate and active program for the **conservation** of **endangered** and **threatened species**. The state program must meet certain conditions (see ESA § 6(c)).

**Cost-effectiveness.** Economical in terms of tangible benefits produced by money spent.

- Critical habitat.** The specific areas within or outside the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection (ESA § 3(5)(A)(i and ii)). Except in those circumstances determined by the Secretary, critical habitat shall not include the entire geographical area which can be occupied by the species (ESA § 3(5)(c)).
- Cumulative effects.** "[T]hose effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (50 CFR 402.02).
- Deferred rotation system.** A system of livestock grazing management where livestock are rotated between multiple pastures thus giving the vegetation a rest period in order to promote good range condition.
- Delist(ing).** The process for removing a species from the list of threatened or endangered species under the Endangered Species Act. Species can be delisted if they have gone extinct, recovered, or the original listing was in error.
- Discretionary.** Power of free decision or latitude of choice within certain legal bounds. (See also flexibility.)
- Distinct population segment.** A population of a (sub)species that is separated from other like populations, and may be treated as a species under the Endangered Species Act.
- Dominant-use (zoning).** A system of land management where a specific area is managed primarily for one output (e.g., timber) and another area for another output (e.g., wildlife). Multiple use is maintained across the landscape through a mosaic of dominant-use areas rather than each parcel of land being managed for multiple outputs.
- Downlist(ing).** The process of reclassifying a species from endangered status to threatened status.
- Ecocentric.** Stressing the importance of preserving biodiversity by preserving or not degrading entire ecosystems, rather than focusing only on individual species or an individual organism. Cf. anthropocentric.
- Ecological processes.** Simple and complex natural functions performed at the ecosystem level, such as the purification of water as it moves through stable substrates, the production of oxygen by plants, and the regulation of wildlife populations through interactions between predation, or changes in food supply, etc.
- Economics.** The study of the way resources are allocated among alternative uses to satisfy human wants.
- Economic analysis.** The study of the benefits and costs of an action. Economic analysis is often concerned with efficiency.
- Economic impact.** The effect, positive or negative, of some action or inaction on the economy. Economic impact is usually expressed in terms of dollars, income, or number of jobs.

- Economic value.** The value of goods and services traded in the marketplace and the value of those goods and services that are not traded that can be assessed through non-market evaluation techniques. See **values**.
- Ecosystem.** An interacting set of organisms and their environment that is defined and bounded at various scales for study or management purposes.
- Ecosystem management.** A resource management philosophy that focuses on landscape patterns and the maintenance of **ecological processes** while providing for human needs with an emphasis on the condition of the area following a management activity.
- Efficiency.** A measure of how the increases in the **welfare** of one individual or group affects the **welfare** of others.
- Emergency listing.** The process that can be used to hastened the **listing** or reclassification of a **species** if an emergency posing a risk to the well-being of the **species** arises. A notice must be published in the *Federal Register* stating the reasons for the emergency listing and states where the **species** occurs must be notified. The emergency rule lasts for 240 days or until the formal **listing** or reclassification process is completed (ESA § 4(b)(7)).
- Endangered.** "Any **species** which is in danger of **extinction** throughout all or a significant portion of its **range**" (ESA § 3(6)).
- Endangered Species Committee ("God squad").** Composed of the Secretary of Agriculture, Secretary of the Army, Chairman of the Council of Economic Advisors, Administrator of the Environmental Protection Agency, Secretary of the Interior, Administrator of the National Oceanic and Atmospheric Administration, and an appointee in the affected state(s) made by the President to review applications for exemption of proposed federal activities from a **jeopardy** opinion or other Endangered Species Act provisions (see ESA § 7(e)).
- Environmental assessment (EA).** A document prepared by a federal agency proposing a major action as a prelude to an **environmental impact statement**.
- Environmental impact statement (EIS).** A document prepared by a federal agency proposing a major action, as mandated by the National Environmental Policy Act, that describes the environmental impacts of the action, alternative actions, the preferred alternative, a **listing** (summary) of public comments, and a Record of Decision.
- Evolution.** A theory of the way in which present-day organisms developed, involving changes in the genetic makeup of **populations** passed on to subsequent generations.
- Evolutionarily significant unit (ESU).** A **population** that is reproductively isolated from other **populations** of the same **species**, which therefore represents an important component in the evolutionary history and future evolutionary potential of the **species**.
- Experimental non-essential population.** An **experimental population** considered not to be essential to the **persistence** of a **species**.
- Experimental population.** A class of **listed species** that were **reintroduced** into unoccupied, suitable habitat; classified as either essential or nonessential to the **persistence** of the **species**; must be physically separate from non-experimental **populations**; the designation is designed to allow for greater management flexibility.

**Expert witness.** A person who has special or extensive knowledge of a subject gained through formal education, professional training and/or practical experience.

**Extinction.** The dying out of a **species**, or the condition of having no remaining living members; also the process of bringing about such a condition.

**Extirpate.** Eradication; the loss or removal of a **species** from one or more specific areas, but not from all areas.

**Federal Land Policy and Management Act (FLPMA).** A law passed in 1976 that established management guidelines for **federal lands** managed by the **Bureau of Land Management**.

**Federal lands.** Areas under the administration of a federal agency such as the **U.S. Forest Service**, **National Park Service**, **Bureau of Land Management**, and **U.S. Fish and Wildlife Service**.

**Federal Register.** A United States government publication where all major federal actions, rules, and regulations are announced.

**FEMAT.** An acronym for Forest Ecosystem Management Assessment Team; a team of scientists established in 1993 to deal with issues regarding spotted owls and timber harvests on federally owned forests in western Washington and Oregon and northern California. Often used to refer to the process used by the team and the products of their efforts.

**Flexibility.** The capability of adapting to new, different, or changing requirements or situations. (See also **discretionary**.)

**Floor.** A lower limit; base.

**Forest plan.** A document prepared under the **National Forest Management Act** by each national forest that generally describes how the resources in the forest will be managed for a 10-15 year period. The plans are subject to the **National Environmental Policy Act** and are accompanied by Draft and Final **Environmental Impact Statements** and a Record of Decision.

**Fragmentation (of habitat).** The dividing of large continuous areas of **habitat** by disturbances (usually man-made) in such a manner that the disturbed areas dominate that landscape and remnants of undisturbed **habitat** are surrounded by modified **habitat**.

**Genetic diversity.** Variation in the make up and sequencing of genes among the members of a single **population** or **species**.

**Habitat.** The immediate environment in which an organism or **population** of organism lives; habitat includes such components as cover, food, shelter, water, and breeding sites; the natural abode of a plant or animal, including all biotic, climatic, and soil conditions, or other environmental influences affecting life.

**Habitat conservation assessment (HCA).** A comprehensive, state-of-knowledge technical document that describes life history, **habitat** requirements and management considerations for a **species** or group of **species** throughout its/their occupied **range** on the lands managed by the cooperating agencies. The HCA summarizes the status and distribution of the **species**, identifies **habitat** needs of the **species**, and identifies **habitat** and **species** threats (US-FWS 1994a).

**Habitat conservation plan (HCP).** A document that must be filed along with an ESA section 10 incidental take permit application. The HCP must specify what impacts will likely result from the **taking**, steps to minimize and **mitigate** impacts and funding available to implement steps, alternatives to **taking** considered and why alternatives are not being utilized, and other measures that may be required by the **Service** as necessary or appropriate for purposes of the plan.

**Habitat modification (adverse).** "[A] direct or indirect alteration that appreciably diminishes the value of **critical habitat** for both the survival and **recovery** of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the **habitat** to be critical" (50 CFR 40.02). (See also **significant habitat modification**.)

**Harm.** "[A]n act which actually kills or injures wildlife. Such act may include **significant habitat modification** or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 CFR 17.3).

**Harass.** "[A]n intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering" (50 CFR 17.3).

**Historic range.** The area over which a species has occurred during recorded history.

**Imperiled.** Not an official status, but used to describe **listed species** under the Endangered Species Act, **candidate species** for listing, **sensitive species**, or other rare plants or animals that may be in danger of extinction.

**Implementing regulations.** Regulations used by an agency in the Executive branch of the federal government, such as the **FWS** or **NMFS**, to carry out the statutes and intent of laws passed by Congress.

**Incidental take.** "[A]ny taking otherwise prohibited, if such **taking** is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity" (50 CFR 17.3). The unintentional **taking** of a **listed species** due to an activity; usually identified in a **biological opinion**, which usually contains a number of **reasonable and prudent measures** that the action agency must follow to allow the activity to proceed. The **FWS** may permit any **taking** otherwise prohibited if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity (ESA § 10(a)(1)(B)).

**Injunction.** A court order where one is required to do or refrain from doing a specified act or acts.

**Instream flow.** A measure of the amount of water in a stream or river and how fast it moves.

**Interagency conservation strategy.** A document describing the regulatory mechanisms and agency protocols and structure that will guide the management of a **listed species** following **delisting**. Required before **delisting** can take place with the overall goal of avoiding a re-listing.

**Interagency Grizzly Bear Committee (IGBC).** A group of high-level administrators representing the federal and state agencies that are involved in grizzly bear **recovery**. The IGBC coordinates the agencies efforts in implementing the grizzly bear **recovery plan**.



**Interdisciplinary.** Involving two or more scientific or academic disciplines. Interdisciplinary teams (e.g., biologists, ecologists, economists, sociologists) are often used in natural resource management planning.

**International Union for Conservation of Nature (IUCN).** An international, independent organization made up of representatives from government and nongovernment organizations from 123 countries that promotes scientifically based action for development that is sustainable and provides lasting improvements in the quality of life for people worldwide. IUCN maintains a global network of more than 5,000 scientists and professionals.

**Invertebrates.** Animals without backbones or internal bony skeletons.

**Island biogeography (theory).** A branch of ecological studies of animal and plant communities focused on extinction-colonization rates on oceanic islands and the number of species an island can support based on its land areas. The theory has been extended to **habitat** islands on mainland areas created by **habitat fragmentation** due to human activities.

**Jeopardize (the continued existence).** "[A]n action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and **recovery** of a **listed species** in the wild by reducing the reproduction, numbers, or distribution of that **species**" (50 CFR 40.02).

**Jeopardy.** In relation to **consultations** under section 7 of the Endangered Species Act, an opinion by the **U.S. Fish and Wildlife Service** that a proposed activity is likely to **jeopardize** the continued existence and **recovery** of a **listed species**. A jeopardy opinion generally halts the project until it can be modified and a no jeopardy opinion is reached.

**Just compensation.** As regards property taken for public use, just compensation means the value of the property at the time of **taking**; a settlement that leaves one no poorer or richer than one was before the property was **taken**; fair market value.

**Land and Water Conservation Fund.** A fund within the federal treasury made up of tax revenue from the sale of motorboat fuel and other sources used to assist states in developing recreational facilities and to assist in federal land acquisition and development for recreation and conservation purposes.

**Landscape ecology.** The study of **ecological processes** and spatial patterns at large scales in terms of area and time.

**Likely to affect.** A ruling that an action has the potential to affect a **species** either positively or negatively.

**Linkage (habitat or ecosystem).** A land classification scheme in which large, core protected areas (**wilderness area**, national park) are connected to each other by areas with similar or slightly lower protection standards.

**List(ing).** The process of designating a **species** as **threatened** or **endangered** under the Endangered Species Act.

**Listed species.** A **species** that has been classified as **threatened** or **endangered** by the **U.S. Fish and Wildlife Service** under the Endangered Species Act.

**Litigation.** The process of contesting a situation in a court of law.

**Major federal action.** An action funded or carried out by a federal agency that meets one of the following criteria: has a significant affect in one of several contexts, has either a beneficial or adverse impact, may affect public health and safety, the action area has unique characteristics, the action is highly controversial, the effects are highly uncertain, the action may be precedent setting, the action may contribute to **cumulative impacts**, the action affects an historic site or a **listed species**, or the action violates an environmental law.

**Mandates (legal).** Specific, unambiguous directions given in laws or **regulations**.

**Marginal costs.** The addition to total cost resulting from the addition of the last unit of output.

**Memorandum of Understanding (MOU).** A legal agreement made between parties outlining the actions, responsibilities, and expectations of each party.

**Metapopulation.** As originally developed, a **population** composed of smaller distinct local **populations** that occasionally went extinct but were re-established by members **dispersing** from the other local **populations**. Modern connotations embrace the more general idea of **populations** that are separated from one another with varying degrees of **connectivity** and chance of extinction.

**Mitigate.** Modifying of actions that (1) avoid impacts by not taking a certain action or parts of an action; (2) minimize impacts by limiting the degree or magnitude of the action and its implementation; (3) rectify impacts by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (5) compensate for impacts by replacing or providing substitute resources or environments.

**National Biological Service.** A new agency, created in 1993, in the Department of the Interior that has taken over the research duties of the **U.S. Fish and Wildlife Service**, the National Park Service, and other Interior agencies, and whose mission is to inventory the natural resources of the United States and develop methods to conserve those resources.

**National Environmental Policy Act (NEPA).** An act, passed in 1969, that codified the national policy of encouraging harmony between humans and the environment by promoting efforts to prevent or eliminate damage to the environment. The act requires that before major federal actions that affect the quality of the environment can be undertaken an **Environmental Impact Statement** must be prepared.

**National Forest Management Act (NFMA).** The major act, passed in 1976, that determines how national forests are managed by requiring land and resource management planning for units within the national forest system and additional regulation of timber harvesting. The major provisions of the act require (a) public participation in the planning process, (b) regulations for the preparation and revisions of the management plans, (c) resource management guidelines for controversial management activities such as clear-cutting, and (d) **economic analysis** of management alternatives.

**National Marine Fisheries Service (NMFS).** The agency within the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce that provides management, research, and services for the protection and rational use of living marine resources for their **aesthetic, economic, and recreational values**. NMFS is one of the two agencies with statutory responsibility for implementing the ESA and has responsibility for **anadromous** fish.

**National Research Council (NRC).** An independent advisory council to the federal government on scientific and technical questions of national importance. Administered by the National Academy of Sciences.

**National Wilderness Preservation System.** The **wilderness areas** of the United States that were created and managed under the Wilderness Act of 1964.

**Nature Conservancy, The.** National, nonprofit, membership organization committed to preserving **biological diversity** by protecting natural lands, and the life they harbor; cooperates with educational institutions, public and private conservation agencies. Works with states through "natural heritage programs" to identify ecologically significant natural areas.

**No effect.** A determination that an action will have no effect on a **species**.

**No surprises.** A policy that would ensure that once a **Habitat Conservation Plan** is developed and an **incidental take** permit issued for a particular **species** that the **Service** could not require that the plan be modified or the permit revoked.

**Objectivity (scientific).** Expressing or dealing with facts or conditions as perceived without distortion by personal feelings, prejudices, or interpretations.

**Oversight (federal).** The ability of the U.S. Congress to scrutinize and evaluate the application, administration, and execution of laws and policies.

**PACFISH.** Commonly used name for the Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho and Portions of California; an interim management strategy for **anadromous** fish-producing **watersheds** adopted by the **USFS** and **BLM** for an 18-month period beginning in February 1995 while long-term management strategies are developed through geographically-specific **Watershed Analyses**.

**Peer review.** The process where scientific information and findings are scrutinized and evaluated by scientists and experts other than those who originally gathered or analyzed the information.

**Permitees (grazing).** Persons or organizations who have obtained permits and paid for the right to graze a specific number of livestock on a specific parcel of land managed by the **USFS** or **BLM**.

**Persistence (probability of).** The likelihood of survival.

**Petition.** An application for some action made to the court by one side in a dispute; submitting a petition to the court.

**Policy alternatives.** Options for solving a policy problem.

- Policy process.** A series of phases that most policy issues go through that includes: problem recognition and definition, alternative development and recommendation, alternative implementation, policy evaluation, and continuation, modification, or abandonment.
- Population.** A group of fish or wildlife in the same taxon below the subspecific level, in common spatial arrangement that interbreed when mature (50 CFR § 17.3).
- Population viability.** The persistence of a population in a specific area over a specific time.
- Private land.** Areas owned by entities other than local, county, state, and federal governments, including individual home sites, farms, ranches, and industrial timberlands.
- Property rights.** Economic interests supported by the law.
- Public Land Law Review Commission.** A federal commission chartered in 1964 to review legislation related to public lands and natural resource management and make proposals for new legislation and policies. Issued its final report in 1970.
- Range (of a species).** The geographic area of occurrence of a species.
- Real property.** Land, and generally whatever is erected or growing upon or affixed to land.
- Reasonable and prudent alternatives.** A set of options required by the U.S. Fish and Wildlife Service to avoid an Endangered Species Act taking that are usually a part of a biological opinion.
- Reauthorization.** A process whereby Congress periodically renews the authority of certain laws.
- Recovery (recover).** Action that is necessary to reduce or resolve the threats that caused a species to be listed as threatened or endangered.
- Recovery goals.** A specific set of targets identified in a recovery plan such that when a listed species reaches those targets they will be considered recovered. These targets include both population variables and regulatory mechanisms to assure a sustained recovery.
- Recovery plan.** A document prepared by the U.S. Fish and Wildlife Service for listed species describing why they were listed, their present status, the need for recovery, steps to be taken to achieve recovery, monitoring methods to assess recovery, and the point at which the monitoring indicates the species has recovered.
- Recovery team.** The group of scientists, resource specialists, agencies, and institutions that may help the Service to develop and implement recovery plans (ESA § 4(f)(2)).
- Recovery zone.** The area in which listed species are to be recovered.
- Recruitment.** The addition to a population from all causes (i.e., reproduction, immigration, and stocking). Recruitment may refer literally to numbers born or hatched or to numbers at a specific stage of life such as breeding age or weaning age.
- Regulation.** A specific rule that is developed to implement the broad directions of a law.

**Reintroduction.** The process of establishing a species in an area that it previously occupied but no longer occupies.

**Riparian area.** A geographic area containing an aquatic ecosystem and adjacent uplands that directly affect it.

**Risk.** The possibility of loss; the possibility of a particular outcome. (Cf. **uncertainty**.)

**Roadless areas.** Areas of western national forests greater than 5,000 acres that do not contain any roads and have been inventoried by the U.S. Forest Service for their suitability as wilderness areas.

**Rule (proposed, final).** Regulations developed by a federal agency which are published in the *Federal Register* for public comment, or as adopted.

**Sensitive species.** Those that occur on U.S. Forest Service lands that are rare and may be declining, and which receive special attention when an activity is planned and implemented; somewhat analogous to U.S. Fish and Wildlife Service candidate species.

**Service.** The U.S. Fish and Wildlife Service and the National Marine Fisheries Service, as appropriate depending on the species involved.

**Significant habitat modification.** The alteration of habitat so that it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

**Significant impact.** Impacts having the potential for alteration of an ecosystem or measurably affecting existing or future populations. Can be beneficial or detrimental.

**Special rule.** A rule that the Service may issue that allows the take of a threatened species under certain circumstances (ESA § 4(d)).

**Speciation.** Formation of new species from existing ones through natural selection in response to changes in environmental conditions.

**Species.** 1. "[A]ny subspecies, of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature" (ESA)3(15)). 2. A category of biological classification ranking below the genus or sub-genus comprising related organisms that are potentially capable of interbreeding.

**State lands.** Areas under the administration of a state agency; typically in the West, these are endowment trust or grant lands that were given to the states from the federal land base to support the public school systems.

**Status review.** The Endangered Species Act requires that the Secretary review the status of all listed species every five years to determine if conditions have changed and a reclassification or delisting is warranted.

**Subspecies.** A population or populations of a species that are geographically isolated for a sufficient amount of time to develop distinct characteristics, and would successfully interbreed if no longer isolated.

**Sustainable development.** Managing the economy and renewable resources of an area for the common good of the entire community and the environment. Improving the quality of human life while living within the carrying capacity of supporting **ecosystems**.

**Take.** "[T]o **harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct**" (ESA § 3(18)). **U.S. Fish and Wildlife Service** regulations define **adverse habitat modification** as a take.

**Taking (of property).** Transfer of possession, dominion or control; to deprive one of the use or possession of; to assume ownership.

**Threatened.** "[A]ny species which is likely to become an **endangered species** within the foreseeable future throughout all or a significant portion of its **range**" (ESA § 3(19)).

**Trust for Public Lands.** A national, nonprofit organization formed to help public agencies and communities acquire and protect land of recreational, ecological, and cultural value for the public.

**Uncertainty.** The state or quality of being unknown or vague. (Cf. **risk**.)

**U.S. Fish and Wildlife Service (FWS).** The agency within the U.S. Department of the Interior that is responsible for the conservation of the nation's migratory birds, **threatened** and **endangered** species, certain mammals, and sport fishes. The **FWS** manages the national wildlife refuge system. The **FWS** is one of two federal agencies with statutory responsibility for administering the **ESA**.

**U.S. Forest Service (USFS).** The federal agency within the U.S. Department of Agriculture that administers National Forests and Grasslands and is responsible for the management of their resources.

**Value (as in value position, value-driven).** Personally-held or ethically-based standards or principles as opposed to scientifically based standards or principles.

**Values.** Principles, standards, or qualities considered worthwhile or desirable. "Esthetic, ecological, educational, historical, recreational, and scientific" values of fish wildlife and plants are recognized in the **ESA** (§ 2(a)(3)).

**Vertebrate.** An animal with a backbone or spine.

**Viability.** The ability of a wildlife or plant **population** to maintain sufficient size so that it persists over time in spite of normal fluctuations in numbers; usually expressed as a probability of maintaining a specific **population** for a specified period.

**Warranted but precluded.** A protocol of the Endangered Species Act that applies to the **listing** process when the available data indicates that a **listing** or a reclassification is appropriate, but other factors such as funding levels, judicial rulings, or similar protection for other **species** makes the action unnecessary or contradictory.

**Water right.** Legal rights to water supplies derived from common law, court decisions or statutory enactments.

**Watershed.** The drainage basin contributing water, organic matter, dissolved nutrients, and sediments to a stream or lake.

**Watershed Analysis.** A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis is a stratum of ecosystem management planning applied to watersheds of approximately 20 to 200 square miles.

**Welfare.** Well-doing or well-being in any respect; the enjoyment of health and common blessings of life; exemption from any evil or calamity; prosperity; happiness.

**Wilderness areas.** Areas in the National Wilderness Preservation System that were established by the U.S. Congress and are managed under the provisions of the Wilderness Act.