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<td>Implement effective planning and problem solving approaches individually and in teams that consider economic, social, and ecological impacts of rangeland projects and plans.</td>
<td><strong>Direct Measure</strong> Students will engage in a land management planning problem in REM 456 (Integrated Rangeland Management) that includes an individual and group component.</td>
<td><strong>Direct Benchmarks</strong> Nearly all (i.e., &gt; 80%) of REM students will successfully complete individual and group land planning assignments in REM 456 with a score that exceeds 80% (i.e., B-Level)</td>
<td><strong>Direct Findings</strong> <em>In 2016, only 67% of REM students in REM 456 got a final score &gt;80% on the final planning assignment (8 of 12 students). The average score of REM students on this project was 79%.</em></td>
<td>1) Increase emphasis on economic implications in final project in REM 456. 2) Make sure to include active land managers and conservationists on field trips and in projects and case studies. The goal of including land managers is to extend the knowledge of ecological principles to how these are applied in land management decisions.</td>
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<td><strong>Aligns with University Learning Outcome(s):</strong> Learn and Integrate Communicate Clarify Purpose and Perspective</td>
<td><strong>Indirect Measure</strong> Focus group discussions will assess student ask student to evaluate their perceived ability to integrate concepts and values.</td>
<td><strong>Indirect Benchmarks</strong> <strong>Ability of students to develop and implement projects that integrate economic, social, and ecological concepts will be reviewed and described by instructors of REM 440 and 456.</strong></td>
<td><strong>Indirect Findings</strong> REM students can develop unique and creative solutions to real world problems. However, students are often not realistic about the potential application of their plans. Students are able to integrate ecological and social concepts in planning projects. However, few students can address the economic implications of their proposed plans. REM students appear to possess adequate land planning skills based on discussions with students, faculty,</td>
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<td><strong>Face-to-Face Measures</strong> Senior exit interviews are regularly conducted. In this interview students are asked about their perceived skill in land management planning.</td>
<td><strong>Indirect Findings</strong> <strong>Comments on senior exit interviews will be assessed to evaluate student knowledge and perceived competency in land management planning concepts.</strong></td>
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Face-to-Face Findings
In senior exit interviews, all students (n=9) in the 2015-16 school year expressed confidence in their ability to make “wise” land management decisions. Most students recognized that they would need to consult others involved in the situation to make strong decisions. Comments in Focus Group discussion also expressed confidence in an ability to make land management decisions. However, students expressed concern that the curriculum focused on “ecology” and little on “management.”
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<td>Use spatial tools (including maps, GPS, GIS, and remote sensing) to observe and interpret ecosystems and aid in making management decisions.</td>
<td><strong>Direct Measure</strong>&lt;br&gt;REM students develop and test their skill in GIS and goespatial analysis in REM 460. The instructor of REM 460 will assess student skills and knowledge relative to the use of spatial tools in the final assignment in REM 460.</td>
<td><strong>Direct Benchmarks</strong>&lt;br&gt;Nearly all (i.e., &gt; 80%) of REM students will receive a score exceeding 75% on the final assignment in REM 460.</td>
<td><strong>Direct Findings</strong>&lt;br&gt;The four assignments in REM 460 are well designed and rigorous. Most REM students (10 of 12) received a score exceeding 75% on these assignments.</td>
<td><strong>Indirect Findings</strong>&lt;br&gt;Faculty are increasingly receiving GPS information and GIS analysis in class projects even when it is not required. This indicates that students are feeling confident in their ability to use GPS and GIS. However, very few remote sensing approaches are included.</td>
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<td><strong>Aligns with University Learning Outcome(s):</strong> Learn and Integrate Think and Create</td>
<td><strong>Indirect Measure</strong>&lt;br&gt;Instructors of upper division range courses will include geospatial activities in their courses to advance and assess student knowledge. Competency of students on these activities will be evaluated.</td>
<td><strong>Indirect Benchmarks</strong>&lt;br&gt;Comments from seniors in their final semester will indicate that they feel confident in their ability to collect geospatial data and make decisions based on these data.</td>
<td><strong>Face-to-Face Findings</strong>&lt;br&gt;All students indicated in senior exit interviews that they feel confident in their ability to use GPS. Most students stated that they had sufficient</td>
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regarding their ability to use geospatial tools.

GIS skills gained in classes and on-the-job to follow instructions and use GIS software. However, students uniformly expressed concern that they would not be able to conduct a GIS project from “scratch.” Focus group discussions confirmed that students did not feel confident in their ability to use GIS. They believe it is an important skill and would like more GIS projects included in coursework.
Learning Outcome(s) | Assessment Tools and Procedures | Benchmarks | Findings | Curricular and Co-Curricular Changes to be Made
--- | --- | --- | --- | ---
Conduct rangeland inventories and perform field measurements of upland and riparian habitats in shrublands, grasslands, woodlands, and deserts. | Direct Measure
Habitat assessment and vegetation measurement skills will be assessed for all REM students by examining student scores on two assignments (2-Sampling & 3-Data Analysis) in REM 459. | Direct Benchmarks
**All REM students will exceed 85% on the “Sampling” assignment in REM 459**
All REM students will exceed 85% on the “Data Analysis” assignment in REM 459. | Direct Findings
**In 2015, most REM students (7 of 10) had an average score greater than 85% on the Sampling assignment in REM 459. The average score of REM students on this assignment was about the same as non-majors (88% for REM, 87% for Non-majors)**
**In 2015, avg. scores for REM students on the Data Analysis assignment in REM 459 was 73%. And, only 20% of REM students exceeded the score of 85%.** | The REM faculty are concerned by the low scores for field sampling and analysis assignments in REM 459. We will examine assignments and projects in REM 410/411 to make sure that students are prepared for the field project in REM 459. Students will also be advised and assisted to secure summer jobs with land management agencies to strengthen their field assessment skills.

Aligns with University Learning Outcome(s): Learn and Integrate Think and Create

Direct Measure
Instructor of REM 459 will describe weather students (who have taken REM 410) generally do or do not have the ability to conduct and analyze rangeland field assessment.

Indirect Measure
**Comments in senior exit interviews will indicate that vegetation measurement skills were included in several classes (i.e., REM 410 and REM 459) and that they feel confident that they could conduct a monitoring or assessment plan for habitat assessment.**

Focus group discussions will indicate that students feel confident in their ability to conduct field assessments.

Findings
Dr. Strand, who
assessment will also be covered in focus group discussion conducted every fall among junior and senior students.

requires field investigations in her classes, and summer employers of students indicate that REM students are competent in their ability to make measurements of plant communities and make basic conclusions on condition, health, and disturbance of these communities.

Face-to-Face Findings
Discussions in exit interviews indicate that students who have taken REM 410/411 at the U of I and who have had summer field experience feel confident in their ability to measure and monitor plant communities. Student’s often note that information and skills gained in classes were strengthened by field experienced gained in summer jobs with land management agencies.
Learning Outcome(s)

Effectively communicate plans and decisions in light of existing policies and laws.

Aligts with University Learning Outcome(s): Communicate

Assessment Tools and Procedures

Direct Measure
Students will engage in a land management planning problem presented in REM 456 (Integrated Land Management). This planning problem will include a description of laws and policies that affect management decisions. Students also describe laws that will need to be considered in projects related to fire, grazing, water, wildlife or invasive plant management.

Indirect Measure
In focus group discussions held every fall, juniors and seniors are asked specifically about their perceived competency in communication and knowledge of natural resource policy and laws.

Face-to-Face Measures

Benchmarks

Direct Benchmarks
**Nearly all (i.e., > 80%) of REM students will receive a score exceeding 75% on an assignment that examines NEPA projects currently underway in the BLM, USFS, or other federal agency.

Indirect Benchmarks
** Students will express confidence in their knowledge of natural resource laws and policies in senior interviews and focus group discussions.

Findings

Direct Findings
**In 2016, all of REM students who submitted the NEPA project (n=9) received a score that equal to or exceeded 75% in REM 456.

Indirect Findings
** Students consistently express concern that they are not able to address the legal or policy aspects of land management decisions. Employers of our students have noted that students are not prepared for this aspect of their jobs. However, these employers note that each student will need to learn agency-specific procedures to address policy issues. This agency-specific information must be learned on the job.

Face-to-Face Findings
In senior exit

Curricular and Co-Curricular Changes to be Made

The REM faculty are concerned that students do not have a sufficient background in natural resources policy and law to make effective land management decisions. Our efforts to engage professors outside the REM degree have largely failed. We have decided to build on the success of the NEPA assignment in REM 456 which apparently gives students confidence to understand basic aspects of NEPA. We will identify projects related to the Endangered Species Act and the Clean Water Act (at minimum) that can be implemented in courses required by REM students.
Senior exit interviews are conducted with nearly every graduating senior. In this interviews students are asked specifically about their knowledge of natural resource policy and laws.

Interviews and focus group discussions, students noted that they understand the basic intent of NEPA, because of a project in REM 456. However, about half of the students in exit interviews and most students in focus group discussions stated that they did not feel confident in their ability to apply natural resource policies in laws when making natural resource decisions.
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| **Demonstrate a sound understanding of science and the application of the scientific method to addressing natural resource questions.** | **Direct Measure**  
An assignment in REM 411 focuses on the use of hypotheses and statistical tests to examine the effects of land management treatments or differences between communities.  
**Indirect Measure**  
A question in the yearly focus group discussions with juniors and seniors asks students to address their ability to use the scientific method.  
**Face-to-Face Measures**  
Senior exit interviews include an assessment of REM 411 and a specific discussion of the student’s perceived confidence in their ability to apply statistics and the scientific method. | **Direct Benchmarks**  
**Nearly all (i.e., > 80%) of REM students will receive a score exceeding 75% on an assignment in REM 411 that examines their ability to formulate and test hypotheses.**  
**Indirect Benchmarks**  
** Students will express confidence in their ability to apply the scientific method to rangeland management problems in senior interviews and focus group discussions.** | **Direct Findings**  
A major revision to REM 411 and new instructor will require a new benchmark of how to assess this learning objective.  
**Indirect Findings**  
Based on class assignments, the REM faculty team believes that students have a basic understanding of the scientific method for students of their age and experience.  
**Face-to-Face Findings**  
Student comments in focus group discussions expressed confidence in applying the scientific method to determine outcomes of research and monitoring. Students indicated that the projects in REM 459 were working well and allowed them to gain experience in testing | The REM Faculty agree to examine existing assignments and activities in REM classes related to the application of the scientific method. Increase emphasis or clarity of the topic in these assignments where possible. Add components that include application of the scientific method in courses that currently do not include the topic. |
Close the Loop Questions

Discuss your progress on the actions identified in your Assessment plan for 2014-15.

We discussed ways to increase emphasis on GIS in our courses. Dr. Strand took lead in revising projects in REM 460 to increase this emphasis. The Rangeland Faculty have worked to add more content on natural resource policy and law in our courses. In addition, we have learned more about other courses on campus that might address this issue. We made suggestions during advising to students.

In what ways were the changes you made in 2014-15 effective in improving your program?

Our two biggest challenges remain giving students hands on experience with geospatial technologies and an adequate understanding of natural resource policies and laws related to land management. Our efforts to improve student confidence in using GIS is apparently working. However, graduates of the Rangeland Ecology and Management degree continue to believe that they do not receive a sufficient background in natural resource policy and law.

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