

# AQUACULTURE

## RESEARCH INSTITUTE

### WORLD AQUACULTURE SOCIETY AWARDS RON HARDY HIGHEST HONOR

**R**on Hardy, Director of the Aquaculture Research Institute, received the Honorary Lifetime Membership award from the World Aquaculture Society at its annual conference, held this year for the first time in Cape Town, South Africa. The Honorary Lifetime Membership, the highest honor given by the Society, is awarded to one person in the world each year as recognition for their lifetime achievement in service to the Society and for scientific contributions that advance the global aquaculture industry. Dr. Hardy was elected to leadership positions in the Society for five consecutive years, serving as secretary and vice president. He is the author or co-author of over 300 scientific papers in the area of fish nutrition. Among his many accomplishments, he chaired the National Research Council's committee that wrote 'Nutrient Requirements of Fish and Shrimp' published in 2011 by National Academy Press. This comprehensive publication is considered the 'Gold Standard' by the scientific community and the global fish feed industry. Dr. Hardy also co-authored 'Fish Nutrition, 3rd Edition' published in 2002. This book is used worldwide as a reference text and has been translated into many

languages, including Chinese and Greek. This award recognizes Dr. Hardy's longstanding and significant contributions to the field of aquaculture.

Dr. Hardy joined the University of Idaho in 1996, having previously been a research professor at the School of Fisheries, University of Washington and a Supervisory Research Chemist at the National Marine Fisheries Service, now called NOAA Fisheries. He received his PhD from the University of Washington in 1978. He established the Hagerman Fish Culture Experiment Station which has grown from a start-up university research facility to an internationally-recognized leader in sustainable aquaculture and became Director of the Aquaculture Research Institute in 2002.



President of the World Aquaculture Society, Dr. Juan-Pablo Lazo, presenting Dr. Hardy with lifetime achievement award.

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# 2017 IDAHO COLDWATER FISH CULTURE SHORT COURSE

*Submitted by Ken Cain, Gary Fornshell and Brian Small*

Jamie Mitchell (Manager, IDFG McCall Fish Hatchery) contacted the University of Idaho's Aquaculture Research Institute (ARI) faculty, Gary Fornshell (Extension Educator) and Brian Small (Professor and Director, Hagerman Fish Culture Experiment Station), in the fall of 2016 to request ARI repeat its short course on coldwater fish culture, last offered to IDFG in the summer of 2011. The course was designed to replace and update a similar course formerly offered by the US Fish and Wildlife Service for professional hatchery workers and others employed by fisheries agencies. ARI agreed to offer the course again for IDFG and open it to tribal, industry and agency hatchery worker participation.



The course directors, Dr. Brian Small and Gary Fornshell, worked with other ARI faculty, IDFG and USFWS employees to develop a revised week-long curriculum to be delivered in the summer of 2017. As a result, the "2017 Idaho Coldwater Fish Culture Short Course" was held July 10th – 17th at the Hagerman Fish Culture Experiment Station. Thirty-five participants registered for the course, including four University of Idaho graduate students who registered for credit through the UI Department of Fish and Wildlife Sciences. The remaining 31 participants included 14 state, 2 federal, 4 tribal, and 9 industry hatchery employees, as well as two undergraduate students supported by the Idaho Chapter of the American Fisheries Society.

The short course covered a range of topics related to coldwater fish culture, combining intensive lectures with applied knowledge and techniques through laboratory and field exercises. Instructors Dr. Brian Small (UI) and Dr. Matt Powell (UI) covered fish anatomy, physiology, and genetics. Participants then dissected fish and discussed tissue/organ function. Dr. Jessie Trushenski (IDFG) and Gary Fornshell (UI) presented the basics of fish nutrition and feeding, including a hands-on learning activity on fish feeding. Dr. Small explained the basis of fish stress, how it affects fish and how to manage fish culture practices to reduce stress in hatcheries. A laboratory demonstration by Dr. Powell then allowed participants to measure the effects of fish transportation on water quality and stress-related blood parameters.



Participants partook in a field trip to local fish hatcheries where tilapia and trout are farmed. This provided an opportunity to connect classroom learning with commercial farming practices. Participants also visited two hatcheries involved in rearing steelhead trout for mitigation and rainbow trout for fisheries enhancement. Given their different missions, fish culture practices differ between commercial fish farms and agency hatcheries. During the field trip, the group was treated to a burbot lunch prepared by Kirt Martin at Snake River Grill. Burbot is a freshwater member of the cod family that is a candidate species for commercial food fish production. Studies are being conducted at the College of Southern Idaho fish hatchery

under the direction of Ken Cain (Professor in the UI Department of Fish and Wildlife Sciences and ARI Associate Director) to assess their performance under farming conditions.



The last two days of the course focused on fish health and hatchery management. Fish health, pathology, and biosecurity were covered by Dr. Ken Cain (UI), Laura Sprague (USFWS) and Gary Fornshell (UI). Participants learned dissection skills by performing fish necropsies and examining tissues under the microscope. On-farm management and fish transportation were covered by instructors Gary Fornshell (UI) and Joe Chapman (IDFG), who brought their combined years of experience into the classroom, with several activities demonstrating how to apply what was learned throughout the week. The course was a success and will likely be offered again in 2020.



## AQUACULTURE RESEARCH INSTITUTE

The ARI newsletter is published semi-annually and available online in Adobe Acrobat format through [www.uidaho.edu/aquaculture](http://www.uidaho.edu/aquaculture). If you would like to be notified via email when the latest edition is available on our web page, please notify the editor at [aqua@uidaho.edu](mailto:aqua@uidaho.edu).

We would be happy to include appropriate contributions from those of you working in the field. Feedback and suggestions on how to improve this newsletter would also be appreciated.

This issue of the newsletter highlights various projects being conducted on the Moscow campus, the Hagerman Fish Culture Experiment Station and includes various extension activities.

The Aquaculture Research Institute Newsletter provides information about aquaculture-related activities at the University of Idaho. Articles in this newsletter may be reproduced without permission, provided they are properly cited. Please feel free to submit comments or material you would like us to consider for publication to:

Dr. Ken Cain, Editor  
Aquaculture Research Institute  
University of Idaho  
875 Perimeter Drive MS 2260  
Moscow, ID 83844-2260

Email: [aqua@uidaho.edu](mailto:aqua@uidaho.edu)  
Phone: (208) 885-5830  
Fax: (208) 885-5968  
Website: [www.uidaho.edu/aquaculture](http://www.uidaho.edu/aquaculture)





## 2017 NATIONAL AQUACULTURE EXTENSION CONFERENCE

*Submitted by Forrest Wynne, State Extension Specialist for Aquaculture, Kentucky State University and Gary Fornshell, Aquaculture Extension Educator, University of Idaho*

**T**he 2017 National Aquaculture Extension Conference was held from June 5th – 9th at the Riverside Hotel and Convention Center in Boise Idaho. USDA National Institute of Food and Agriculture's (NIFA) five Regional Aquaculture Centers and the NOAA National Sea Grant Program co-sponsored the conference. Held approximately every five years since 1992, this unique conference has provided a forum for professional development and growth for all levels of experience and years of service in aquaculture extension education.

Two full days of presentations were held on June 6th and 8th with a tour day in between. This format led to high tour attendance (approximately 50) and allowed for two full days of sessions in which attendees had the opportunity to present (41 oral presentations and 9 posters). All presentations were recorded by video.

Plenary conference speakers (10) consisted of various agency and private sector personnel over the

two days of sessions, which included Randy MacMillan from Clear Springs Foods and Leo Ray from Fish Breeders of Idaho. The first day held the Communications and Extension Program Updates, General Session, and Poster Session consisting of three-minute poster briefings, which were quite popular with the crowd. The four tour stops, Idaho Aquatics, Fish Breeders of Idaho, University of Idaho Hagerman Fish Culture Experiment Station, and Evaqua Farms (Magic Springs) all received high ratings despite the high air temperatures that day topping out at 97 degrees F. The guided tour was considered by many to be the highlight of the conference. Also rating highly was the Idaho trout served at Tuesday night's dinner and the sturgeon served at the University of Idaho Hagerman Fish Culture Experiment Station during the tour. The Idaho Aquaculture Association sponsored the lunch. The final day of the conference included Freshwater, Great Lakes, and Marine sessions and concluded with an Advocacy in Aquaculture Panel discussion that ran almost an hour and a half.

Following the three-day conference, 52 evaluation surveys were collected. Overall the conference was well ranked by attendees. The last three questions of the evaluation were designed to provide guidance for organizers of the next conference. These questions were the following:

1. What should the national network of Aquaculture Extension Educators focus on over the next five years?
2. What are the takeaway messages from this conference?
3. Should the NAEC be held again in five years?

The Conference Proceedings are found here:

**[depts.washington.edu/wracuw/front%20page/extension\\_conf/extension\\_conf2.html](https://depts.washington.edu/wracuw/front%20page/extension_conf/extension_conf2.html)**

The videos of the presentations are posted on YouTube:

**[youtube.com/channel/UCevU6JxOsIM6j0jFaBI3cyg/videos](https://youtube.com/channel/UCevU6JxOsIM6j0jFaBI3cyg/videos)**



# COLLABORATIVE GRANT AWARDED TO INVESTIGATE THE POTENTIAL FOR COMMERCIAL PRODUCTION OF FRESHWATER COD (BURBOT; *Lota lota maculosa*)

Submitted by Ken Cain

Research teams at the University of Idaho (UI), Colorado State University (CSU), and the Kootenai Tribe of Idaho (KTOI) were selected by the Western Regional Aquaculture Center (WRAC) to receive funding for a 4-year project to optimize aquaculture methods and explore the feasibility for commercial (foodfish) culture of burbot (*Lota lota*). This species is considered a freshwater cod with delicate flesh, and is a prized foodfish in many parts of the US and world. The research group includes Dr. Ken Cain (UI), Dr. Chris Myrick (CSU), Dr. Rick Barrows (USDA retired), Dr. Shawn Young (KTOI), Gary Fornshell (UI extension), and Leo Ray (Fish Breeders of Idaho). Burbot aquaculture efforts in the US began at UI – ARI in 2003 to explore conservation approaches to rebuilding the nearly extinct population in Idaho's Kootenai River. Collaborative efforts between these groups will focus on improving captive broodstock egg quality, optimizing early larval and juvenile rearing and growout methods, determine productivity limits for basic water quality parameters (e.g. ammonia and DO). For those areas of the country where burbot are not native and introduction of this species may be a concern, methods to produce sterile burbot (through triploid induction) will be explored.

A major aspect of this work will be to determine the feasibility of polyculture in facilities currently producing rainbow trout. Since this species grows well at 15°C, the likelihood of production in existing trout facilities is high. As a preliminary trial, burbot were grown to approximately 1lb in size this past year at the College of Southern Idaho. Fish were then processed by Fish Breeders of Idaho and supplied to the Snake River Grill in Hagerman, Idaho for initial evaluation of consumer acceptance and market potential. Customers who ordered burbot for dinner were asked to participate in a survey (and rewarded with a free dessert). Results from customers who ordered burbot from March through July of 2017 were very encouraging. Burbot were prepared a different way each week and those people participating in the surveys were asked a series of questions. To summarize data of over 150 people served different preparations of this species, 82% had never tried burbot before; 93% agreed or strongly agreed with "I like the flavor of burbot"; 96% agreed or strongly agreed with "I like the texture of burbot"; and 96% "would try burbot again". Overall, this suggests that this species would be highly marketable and a potential product that could contribute to diversification of rainbow trout aquaculture.



Juvenile burbot growout at the UI – ARI Moscow campus



Adult Burbot



Burbot dish prepared by chef Kirt Martin.



## NEW DIRECTOR TAKES OVER AT HAGERMAN STATION; LONGTIME LEADER FOCUSES ON EXPANSION

The University of Idaho's Hagerman Fish Culture Experiment Station, tucked against springwater-spouting cliffs near the Snake River in southern Idaho, is home to some of the top fish nutrition research in the world.



This gem of UI research is in the midst of change: Brian Small took over as director of the station this winter. Longtime station director Ron Hardy will now split his time between Moscow and Hagerman, continuing to lead the UI Aquaculture Research Institute while expanding the university's aquaculture program as a whole.

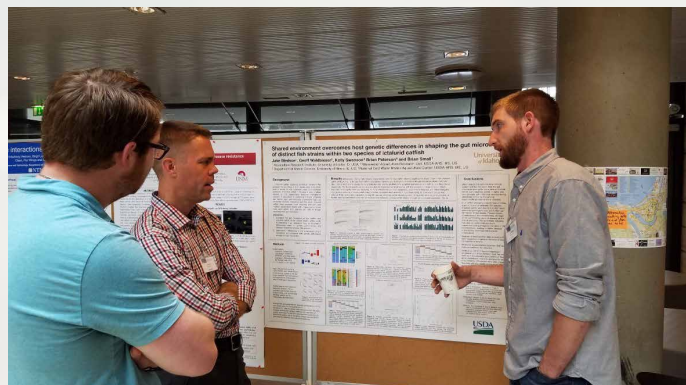
See the full story at: [www.uidaho.edu/research/news/get-to-know-ored/hagerman](http://www.uidaho.edu/research/news/get-to-know-ored/hagerman)

Article by Tara Roberts, University Communications & Marketing

## ARI GRADUATE STUDENT INVITED TO PRESENT AT 1ST INTERNATIONAL FISH MICROBIOTA WORKSHOP

*Submitted by PhD Student Jake Bledsoe*

ARI graduate student, Jake Bledsoe, and his advisor, Dr. Brian Small, traveled to Trondheim Norway on June 19 – 22 for the 1st International Fish Microbiota Workshop. As the first meeting solely devoted to fish microbiota research, the workshop served as a forum for researchers to share and discuss their findings related to the communities of microorganisms that colonize fish. The forty or so researchers in attendance came from across the globe and represented expertise in the fields of nutrition, physiology, immunology, microbiology, ecology, and even physics. Topics covered at the workshop included functionality of host-microbe interactions, community assembly of fish associated microbes, and microbial control within aquaculture. For being the first meeting of its kind, the conference was a huge success and plans for the 2nd International Fish Microbiota Workshop are already in the workings, with the next meeting likely to take place somewhere in the U.S. in 2019. Jake Bledsoe will represent ARI on the planning committee for the 2019 workshop. Jake is a Ph.D. student currently conducting research on host-microbiome relationships in rainbow trout and Atlantic salmon, as fish microbiome research is quickly becoming a substantial part of ARI's research portfolio.



UI-ARI graduate student Jake Bledsoe (right) presents his research on the intestinal microbiota of U.S. farmed catfish at the 1st International Fish Microbiota Workshop in Trondheim, Norway.

# UPDATE: CONSTRUCTION BEGINS ON NEW AQUACULTURE RESEARCH BUILDING AT THE UNIVERSITY OF IDAHO

*Submitted by Ken Cain*

After a number of unforeseen delays, construction began this past summer on the new ARI – Aquaculture Research Building. This new Aquaculture Research Institute (ARI) facility will replace the aging ARI Poultry Hill facility on the University of Idaho (UI) campus. We are excited to see construction underway on this facility, which will provide upgraded laboratory and office space and include approximately 4,000 ft<sup>2</sup> of wet laboratory space, a live feed production room to aid in larval fish species research, and an analytical

laboratory along with quarantine areas and bio-secure access.

The new research facility will increase efficiency and expand aquatic wet laboratory capacity between the university's College of Natural Resources (CNR), ARI campus, and ARI Hagerman facilities. A wired conference room will more effectively link ARI Hagerman and ARI campus operations and promote enhanced distance education efforts. The new facility will continue to utilize recirculation system (RAS) technology for water conservation, and all aquaculture systems will be modular and flexible so that a

variety of research questions in all areas of freshwater and/or marine aquaculture can be addressed.

Ultimately, the ARI aims to further integrate Fisheries/Aquaculture research at the UI and enhance the national and international reputation of these programs. This will maximize research capabilities, increase training opportunities for graduate and undergraduate students seeking careers in Aquaculture and Fisheries sciences, and enhance opportunities for outreach. It is anticipated that the new facility will be operational by mid-2018.



Conceptual drawing showing upper level of new ARI Research Facility

Conceptual view of new ARI Research facility showing the two story layout with the main lobby, conference room, faculty, and student and staff offices on the upper level and laboratory facilities on the lower floor.



Current (November 2017) construction showing initial excavation and progress on foundation and wall supports.





# UPCOMING EVENTS

**FEBRUARY 28-MARCH 2 2018**

**Idaho Chapter of American Fisheries Society (AFS) Annual Meeting,**  
Idaho Falls

**FEBRUARY 19-22, 2018**

**Aquaculture America,**  
Las Vegas, Nevada

**JUNE 2, 2018**

**Idaho Aquaculture Association Annual Meeting,**  
Twin Falls

**AUGUST 19-23, 2018**

**AFS Annual Meeting,**  
Atlantic City, New Jersey

**SEPTEMBER 2-6, 2018**

**Fish Health Section of AFS,**  
Charlotte Town, Prince Edward Island, Canada

**SEPTEMBER 17-19, 2018**

**9th International Conference on Fisheries and Aquaculture,**  
Vancouver, Canada