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May 15, 2013

Senate Committee on Environment and Natural Resources  
Senator Jackie Dingfelder, Chair  
Senator Alan Bates  
Senator Mark Hass  
Senator Bill Hansell

Senator Dingfelder and committee members,

My name is Stan Steele, President of the Oregon Outdoor Council. Thank you for allowing me a few minutes of your time today to discuss HB 3441A.

Let me open my testimony with the assertion that scientific research conducted at the Oregon Hatchery Research Center should intensely blend Conservation Science with the emerging field of Human Dimensions of Fish and Wildlife Science. The complex problems created by an ever growing human population on Oregon's natural resources makes it imperative for today's natural resource scientists, managers and policy makers to reconcile natural resource conservation with our cultural, societal and economic aspirations.

The Oregon Outdoor Council, our partner conservation organizations and business supporters, who represent nearly 70,000 Oregonians, strongly believe that the composition of the Oregon Hatchery Research Center Advisory Board as outlined in HB 3441A will be a shining example of citizens working in collaboration with scientists to identify and answer real-world questions regarding the very complex and often contentious issues surrounding fisheries conservation.

On April 18, 2013, fifty-eight of your colleagues in the Oregon House of Representatives endorsed the concept that HB 3441A will further enhance the successful citizen-led salmonid recovery initiative known as the Oregon Plan for Salmon and Watersheds. Oregonians treasure our state's natural resources and when they are presented with sound science, they will make the right choices. We need to design a bi-directional system for conducting science that connects adaptive hatchery research and engages communities as partners, instead of the one-way dimension of discipline-based science that is often vociferously challenged by the societal component most impacted by

research that excluded stakeholders from the discussion. HB 3441 does that by supporting problem-driven science that involves citizens as partners from defining research questions to applying the co-created knowledge to hatchery management strategies. The Oregon Outdoor Council believes that everyday Oregonians working in collaboration with respected scientists and fisheries managers can lessen the risks to wild fish and sustain abundant recreational and commercial fisheries through science-based hatchery management that benefits all citizens.

Below are four examples of how citizen-science influenced current research at the Oregon Hatchery Research Center:

- **Holding and treatment of wild broodstock**

“Too many of the fish captured for the wild broodstock programs on the Alsea and Siletz rivers were not surviving. So OHRC staff worked with Alsea Hatchery to look at varying fish densities, tank types and treatment regimens to help improve survival of angler and trap caught fish. Based on study recommendations, survival of wild steelhead for these two programs has drastically improved.

It is now recommended that hatcheries with wild broodstock programs adopt the holding protocol developed by OHRC researchers.”

*—OHRC Project Announcement*

To further this same research concept and conclusion, after citizens had observed problematic handling of accumulated traditional winter steelhead broodstock at a coastal hatchery, a request was made of the Oregon Department of Fish and Wildlife to improve the handling and physical treatment of trap caught traditional hatchery broodstock to enhance the efficacy of winter steelhead traditional brood stock augmentation programs.

- **Radio tagging and tracking adult hatchery steelhead in the Alsea River**

“Wild broodstock programs have been implemented in several places in order to minimize the impacts hatcheries have on wild fish populations. However, within an adult fish population there is a lot of phenotypic variation – fish that migrate to the spawning grounds rapidly versus slowly; fish that are aggressive versus passive; fish that mature in the lower river versus the upper river. Researchers at OHRC are studying winter steelhead wild broodstock programs on the Alsea and Nehalem to see how well they represent the phenotypic variety found in the natural run. This study will help managers develop hatchery practices that improve catch rates for anglers while minimizing risk to wild populations.

As part of this study, researchers are working with the Alsea Hatchery to see if releasing smolts lower in the river will increase the number of fish caught by anglers.”

*-- OHRC Project Announcement*

This study resulted from the Alsea Sportsmen’s Association’s review of the historical catch record data which suggested that current hatchery winter steelhead smolt release strategies had significantly impacted the harvest of hatchery steelhead.

- **Winter steelhead harvest vulnerability**

"Do wild broodstock programs in coastal rivers create better steelhead fishing? Researchers will compare catch rates of returning steelhead whose wild parents were caught by anglers to those whose parents were caught in traps. The results will help determine if it's possible to select for fish that are more likely to be caught by anglers."

-- *OHRC Project Announcement*

The idea for this study came from anglers who had discovered similar research conducted on black bass. After years of recognizing that hatchery steelhead (F1's) produced from wild broodstock appeared to make up a larger percentage of their harvest as compared to highly domesticated traditional hatchery management winter steelhead.

- **Olfactory imprinting during embryonic rearing of Chinook and steelhead**

"Researchers have long known that salmon and steelhead use chemical cues in the water to find their way back to natal streams to spawn. As a result, juvenile fish (smolts) are often "acclimated" in particular locations prior to release under the assumption they will key in on the water chemical profile of that location to find their way back to spawn. However, acclimation of smolts can be cumbersome and less than 100 percent effective, leading to "straying" of returning fish. Researchers at OHRC are studying whether or not salmon and trout embryos imprint on chemical features in the water. If they do, acclimating embryos instead of smolts could provide a simple, inexpensive technique to help reduce straying."

-- *OHRC Project Announcement*

Anglers alone cannot claim credit for this research project but can claim that they raised the idea of embryonic imprinting to OHRC researchers during discussions regarding stray rates and how those rates impact coastal winter steelhead hatchery harvest augmentation programs.

Four of the nine current research projects being conducted at the Oregon Hatchery Research Center had their roots in citizen-science!

In August of 2012 a conference was held in Portland titled, "The Conference on Public Participation in Scientific Research." It was attended by more than 300 science researchers, project leaders, technology specialists, evaluators and others - representing many disciplines who gathered to engage in dialogue in an effort to advance the field of citizen-science. The Oregon Outdoor Council endorses the participatory citizen-science concepts discussed at the conference and contained in HB 3441A. While we recognize that the ideas are new to some, they could very well be the blueprint that builds public acceptance of how Oregon manages its hatchery programs.

Some excerpts from this conference:

- 1. Public participation in scientific research has a long history.**

In fact, over much of history people without formal training in science were responsible for most of the science being done. Public participation still contributes key scientific insights today. Until recently, these contributions were overlooked by much of the scientific community and the public, but that is changing quickly. The number of projects designed explicitly to engage the public in the scientific process has exploded in recent years. These projects span most fields of

science—from astronomy to ecology to public health to weather. Unfortunately, it is generally difficult for people working in these different fields to communicate with one another, an obstacle that greatly limits the spread of innovations, research results, and evidence-based best practices.

-- Abe Miller-Rushing, *Science Coordinator*

*National Park Service, Acadia National Park and Schoodic Education and Research Center*

## 2. Citizen Science: Science as if People Mattered

Evidence suggests that the American public is turning away from science. The US ranks 23rd in international science tests, only 70% of Americans can read and understand the science section of the NY Times, investment in research is declining, and US students are avoiding science majors.

This disconnect may be a side effect of our current 'loading dock' model for doing science, where we assume an orderly one-way flow from discovery to impact. This model and its accompanying practices (like glamorizing theoretical work, emphasizing peer-communication, and organizing investigation around disciplines) have isolated scientists and science from the rest of society.

We need to build a new, bi-directional model for doing science that explicitly connects research to applications and engages communities as partners. Instead of the one-way dissemination of discipline-based expertise, we need problem-driven investigations that involve communities as partners in every step from defining research questions to applying co-created knowledge. The model has implications for how we train and reward scientists, how we engage non-scientists, and what kind of knowledge we consider relevant.

This talk is meant to spark a discussion about how to use citizen science to catalyze this new model, since it is rooted in the values and practices of citizen science. In particular, citizen science can be the test-bed and tipping point for participatory approaches, where community members are partners in the design, implementation, and application of research, where research is aligned with community priorities, and where scientific knowledge is placed alongside other ways of knowing.

--Rajul Pandya, *Director*

*Spark: UCAR Science Education, University Corporation for Atmospheric Research*

The Oregon Outdoor Council thanks the Oregon Senate Committee on the Environment and Natural Resources for this opportunity to discuss the Public Participation in Scientific Research concept embodied in HB3441A. Today's hearing is another example of how highly Oregon's elected officials respect the participation of their constituents in the collaborative effort to craft meaningful and publically acceptable natural resource management governance. Movement of HB 3441A by this committee to the Senate floor will reinforce the public's trust that Oregon is doing what's best for its natural resources and citizens.

Thank You,

Stan Steele, President  
Oregon Outdoor Council