



Western Fisheries Research Center (WFRC)

## Western Fisheries Science News



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WFRC has pioneered techniques to track juvenile lamprey. Photo by Michael Durham [www.DurmPhoto.com](http://www.DurmPhoto.com).

### WFRC Supports Pacific Lamprey Conservation

Pacific lampreys are similar in many ways to Pacific salmon. Like salmon, they hatch in streams, migrate to the ocean and then return to streams to spawn and die. Through their migrations they transport nutrients from marine to freshwater systems, helping nourish inland ecosystems. Lampreys are also sacred to Native American tribes and an important traditional food source. Both lampreys and salmon have declined dramatically over the last decades while facing many similar threats. Now northwest tribes are leading the charge to conserve and restore this ecologically and culturally important fish. The USGS supports their effort by providing critical science, much as they have done for salmon over the last 100 years.

To make their way from their natal spawning grounds to the ocean and back, Pacific lamprey must pass through dams on both legs of their journey. It's estimated that less than half survive this gauntlet. For the last 20 years the tribes have worked with federal, state, and university partners to better understand the challenges posed to returning adult lamprey by dams and how best to improve passage and survival. Research has led to the development of mitigation measures like reducing fishway flows at night (when lamprey travel most), constructing ramps, and modifying entrances. Within the last (continued on page 2)

### EVENTS

**WFRC at Climate Roundtable with Secretary Jewell:** On Feb 4, WFRC Director Jill Rolland joined in a roundtable discussion with the Secretary of the Interior, Sally Jewell, on the impacts of climate change on the Northwest. The roundtable, held at the University of Washington, focused on the President's Climate Action Plan to reduce carbon pollution, prepare for climate change impacts, and lead international efforts to combat global climate change. For more information contact [Jill Rolland at jrolland@usgs.gov](mailto:Jill.Rolland@usgs.gov) or 206-526-6291.

**WFRC at Annual Aquaculture America Meeting:** On Feb 9-12, WFRC Director Jill Rolland attended the annual Aquaculture America meeting in Seattle, WA. The meeting, themed "Taking aquaculture to new heights through technology, marketing, collaboration", was sponsored by the U.S. Aquaculture Society (U.S. chapter of the World Aquaculture Society) <https://www.was.org/meetings/Default.aspx?code=AA2014>. For more information, contact [Jill Rolland jrolland@usgs.gov](mailto:jrolland@usgs.gov) or 206-526-6291.

**American Fisheries Society Meeting:** WFRC scientists John Beeman and Rachel Reagan presented at the 2014 annual meeting of the Oregon Chapter of the American Fisheries Society, Feb. 25-28, in Eugene OR. Beeman discussed the downstream passage of juvenile salmonids at Detroit Dam. Reagan discussed a decision support framework for prioritizing culvert replacements in National Forests. For more information, contact [Rachel Reagan at rreagan@usgs.gov](mailto:rreagan@usgs.gov) or 509-528-2299.

(continued from pg. 1) five years focus has expanded to include juvenile lamprey and the separate but related challenges that they face on their way out to sea.

Researchers at the WFRC's Columbia River Research Laboratory are supporting lamprey conservation and restoration by developing methods to tag and track juvenile lamprey (no easy feat with these small worm-like fish) and by providing basic information about juvenile lamprey growth, mortality, and behavior when faced with challenges like irrigation diversion screens. As Matt Mesa, lead lamprey scientist at WFRC, put it, "Our research is very applied science that responds to the specific needs of managers. Once we're finished our results can be used in a number of ways by various groups."

WFRC's science also may inform the decision about whether and how to undertake a production-scale hatchery for lampreys- a restoration measure that the tribes are currently considering. Most in the Northwest are familiar with the numerous hatcheries that produce millions of salmon and trout annually. Because spawning captive lampreys is a relatively straightforward way to produce millions of offspring, there is hope that a hatchery program may help restore their dwindling numbers in the wild. Successful spawning is not the only component of successful aquaculture, however. There are many considerations, including what, how much and how often to feed juveniles; how to keep them in captivity for long periods; and how best to protect them from disease.

The current success of the salmon and trout hatchery programs was built on over a hundred years of research into diets, physiology, disease and reproduction. Despite the similarities, lampreys are different from salmon in important ways and not nearly as well understood. One way in which lampreys differ from salmon is that juvenile lampreys spend years buried in stream substrates before making their journey out to sea. In a lab or hatchery environment this poses a significant challenge to rearing and monitoring the health of fish. While conducting other experiments to meet the needs of partners, WFRC scientists are also collecting basic data on the optimum temperature, density and feeding regime for juvenile lamprey in captivity. There may come a day when this information proves invaluable for the development of the world's first hatchery for Pacific lamprey. For more information visit: <http://goo.gl/F0vzhS> or contact Matt Mesa at [mmesa@usgs.gov](mailto:mmesa@usgs.gov) or 509.538.2299.

## Publications

**New Publication Provides Method for Addressing Predation during Telemetry Studies:** Consumption of tagged fishes by piscivores is problematic for telemetry studies because tag detections from the piscivore could introduce bias into the analysis of telemetry data. In a recent issue of *Animal Biotelemetry*, WFRC scientists and co-authors illustrate the use of multivariate mixture models to estimate group membership (smolt or predator) of telemetered salmon, trout and bass in the

Sacramento River, CA, USA. For more information, visit <http://goo.gl/dfkyGj> or contact Jason Romine at [jromine@usgs.gov](mailto:jromine@usgs.gov) or 509-538-2299.

## New USGS Open File Report Evaluates Effectiveness of Stream Restoration:

WFRC has been working with the Bureau of Reclamation to monitor and evaluate the effectiveness of stream restoration efforts in the Methow River watershed. Restoration efforts are focused on supporting spring Chinook salmon, steelhead, and bull trout currently listed under the Endangered Species Act. In a recently completed USGS open file report titled "Methow and Columbia River studies— Summary of data collection, comparison of database structure and habitat protocols, and impact of additional PIT tag interrogation systems to survival estimates, 2008-2012", researchers summarize work conducted between 2008-2012. For more information, visit <http://pubs.usgs.gov/of/2014/1016> or contact Patrick Connolly [pconnolly@usgs.gov](mailto:pconnolly@usgs.gov) or Kyle Martens [kmartens@usgs.gov](mailto:kmartens@usgs.gov) at 509-538-2299.

## Characterization of a Novel Fish Virus:

WFRC researchers co-authored a paper that reports the molecular characterization of a novel picornavirus recovered from minnows in several areas of the US. In addition to sequencing and characterizing the entire virus genome, the researchers used molecular phylogenetics to determine the taxonomic placement of the virus and an epidemiological analysis to show the relationship among various isolates of the virus from different regions of the US. In addition to characterizing this novel agent, the study highlights the potential for the movement of fish pathogens via the trade in baitfish. For more information, visit <http://goo.gl/BiPtEo> or contact Jim Winton at [jwinton@usgs.gov](mailto:jwinton@usgs.gov) or 206-526-6587.

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