



Western Fisheries Research Center (WFRC)

Western Fisheries Science News



Researchers scan for sucker PIT tags on a mixed nesting colony of American white pelicans and double-crested cormorants at Clear Lake Reservoir in the Clear Lake National Wildlife Refuge. Photo courtesy of USGS.

Are Colonial Waterbirds Inhibiting the Recovery of Suckers in the Upper Klamath River Basin?

In an effort to better understand the decline of the Endangered Species Act (ESA)-listed Lost River and Shortnose suckers, researchers at Real Time Research, Inc. and the U.S. Geological Survey (USGS) Klamath Falls Field Station are employing a technique that has not been used in the Klamath Basin before. In a new study, researchers estimated predation impacts by nesting fish-eating waterbirds utilizing Passive Integrated Transponder (PIT) tag data. Although several types of birds nest in the Basin, and are presumed to forage on suckers, researchers specifically concentrated efforts on American white pelicans (pelicans) and double-crested cormorants (cormorants) nesting at mixed-species colonies on Clear Lake Reservoir, CA and Upper Klamath Lake, OR during 2009-2015. These large birds are thought to cause the greatest foraging impact on adult-sized suckers.

For the study, PIT tags were implanted in Lost River and shortnose suckers. PIT tags allow specific information to be attached to individual fish, including species, size, age-class (adult, juvenile) and release location. These PIT tags also allow researchers to evaluate sucker movements, growth, survival, and other demographic parameters, and have been the backbone of a long-term USGS monitoring program for the endangered suckers in the Klamath Basin.

When the suckers are consumed by waterbirds, some of the PIT tags are deposited in nesting colonies by either regurgitation or defecation. Electronic recovery of PIT tags on waterbird colonies has proven to be helpful in identifying which individual bird colonies pose the greatest threat to fish survival and estimate avian predation rates. Predation rates estimated in the study are known to be minimum estimates, primarily because the study could not (Continued on page 2)

Events

USGS Hosts Science Exchange with Tribes:

On February 22-23, the WFRC Columbia River Research Laboratory hosted a science exchange with members from the Spokane Tribe of Indians, Confederated Tribes of the Colville Reservation, and Coeur d'Alene Tribe of Indians. Participants discussed habitat and fish assessments, food webs and predation in Columbia River reservoirs, fish passage strategies, and innovative technologies. The USGS and tribes have been discussing science and technologies that could support salmon reintroduction in currently blocked areas of the Upper Columbia River. For more information, contact Steve Waste swaste@usgs.gov or 509-538-2299.

Scientist Presents New Dam Removal Science Website to the USGS Community of Data Integration:

On February 10th, Research ecologist Jeff Duda gave an online presentation to the USGS Community of Data Integration (CDI) on the Dam Removal Information Portal (DRIP), a USGS product developed with CDI funding. Arising from a dam removal synthesis project at the USGS John Wesley Powell Center, DRIP is a dynamic, map-based database of dam removal scientific studies that is linked with other USGS and partner cyber infrastructure. The provisional USGS website is available at <http://www.sciencebase.gov/drip>. For more information, contact Jeff Duda, jduda@usgs.gov or 206-526-2532.

Honors

USGS Researcher Selected to Receive Presidential Early Career Award: Maureen Purcell, research microbiologist, has been selected to receive a Presidential Early Career Award for Scientists and Engineers, the highest honor bestowed by (Continued on page 2)

account for the unknown proportion of tags from consumed fish that were not deposited on a colony and were thus unavailable to be detected by the researchers.

Researchers found that predation impacts varied by sucker species, size, age-class, bird colony location, and year, demonstrating that predator-prey interactions were dynamic. Adult suckers as large as 730 mm fork length were consumed by pelicans, and all but the largest suckers in Upper Klamath Lake were susceptible to predation. Although sample sizes for PIT-tagged juvenile suckers were limited, the study provided some evidence that juvenile-sized suckers were more susceptible to avian predation than adult-sized suckers. Results also indicated that predation by pelicans and cormorants may be a factor limiting recovery of ESA-listed suckers in Clear Lake. Survival of adult suckers in Upper Klamath Lake does not appear to be limited substantially by avian predation, as minimum predation rates were less than two percent and overall survival of adult suckers is high. In contrast, avian predation may be a significant source of mortality for adult Lost River and Shortnose suckers in Clear Lake, where estimates of minimum predation rates were as high as five percent. Furthermore, spawning runs into Willow Creek, the lone spawning tributary for suckers in Clear Lake, are limited when flows are low in the creek as a result of drought conditions. These conditions could make suckers more susceptible to avian predation.

Additional research is needed to measure predator-specific predation rates, estimate PIT tag deposition probabilities on bird colonies, better understand biotic and abiotic factors that regulate sucker susceptibility to bird predation, and to better estimate predation rates on juvenile suckers in both water bodies, especially Clear Lake.

The study was funded by Bureau of Reclamation with support from U.S. Fish and Wildlife Service, and the Klamath Sucker Recovery Implementation Team.

For more information, contact Dave Hewitt, dhewitt@usgs.gov, at 541-273-8689

References:

- Hewitt, D.A., and B.S. Hayes. 2013. Monitoring of adult Lost River and shortnose suckers in Clear Lake Reservoir, California, 2008–2010: [U.S. Geological Survey Open-File Report 2013-1301](#), 18 p.
- Hewitt, D.A., E.C. Janney, B.S. Hayes, and A.C. Harris. 2015. Status and trends of adult Lost River (*Deltistes luxatus*) and shortnose (*Chasmistes brevirostris*) sucker populations in Upper Klamath Lake, Oregon, 2014: [U.S. Geological Survey Open-File Report 2015-1189](#), 36 p.
- Evans, A., Q. Payton, B. Cramer, K. Collis, D. Hewitt, and D.D. Roby. 2015. [Colonial waterbird predation on Lost River and shortnose suckers based on recoveries of passive integrated transponder tags](#). Final Technical Report to BOR, Klamath Basin Area Office, Klamath Falls, Oregon. 22 p.

In the News

During the week of February 15, results of a scientific reports manuscript by USGS scientist Jason Romine and co-authors was featured in various news media outlets, including [Science Daily](#), [Bay Journal](#), [Nature World News](#), [Phys.org](#), [Shark Year Magazine](#), [SciFeeds](#), and Wynpr Baltimore public radio. The manuscript challenges a 2007 study claiming that shark declines led to rising population of cownose rays, which was thought to be responsible for the collapse of oyster and shellfish industries along the Atlantic coast. For more information, contact Jason Romine, jromine@usgs.gov or 509-538-2299 x262.

Honors (Continued)

the United States Government on science and engineering professionals in the early stages of their independent research careers. Purcell was selected on many criteria, including her research on the molecular basis of the innate immune response of fish to pathogens or vaccines and the roles of both genetics and the environment in the process. Her work has gained global recognition through a series of highly-cited publications in journals that have significantly advanced our understanding of how finfish respond to microbial threats. The winners will receive their awards at a Washington, D.C. ceremony this spring. For more information, contact Jill Rolland, jrolland@usgs.gov or 206-526-6291.

USGS Scientist Recognized as Member of the Water Prize Competition Center Team to Win “Newcomer of the Year Award” from Challenge.gov:

As described in the winter 2015-2016 edition of the [Bureau of Reclamation’s \(BOR\) Water Prize Competition Knowledge Stream](#) issue, USGS scientist Patrick Connolly and fellow team members were recognized with a “Newcomer of the Year” award. Connolly has been playing a role in shaping prize challenges, initiated by funding gained by the BOR, to design prize competitions for solutions to a number of outstanding questions that impact fisheries resources. Visit <http://www.usbr.gov/research/challenges/> to see more about the Water Prize Competition Center. For more information, contact Patrick Connolly, pconnolly@usgs.gov or 509-538-2299 x269.

Publications

- Grubbs, R.D., J.K. Carlson, J.G. Romine, T.H. Curtis, W.D. McElroy, C.T. McCandless, C.F. Cotton, and J.A. Musick.** 2016. Critical assessment and ramifications of a purported marine trophic cascade. [Scientific Reports 6, Article number: 20970](#).
- Jacobson, R.B., M.J. Parsley, M.L. Annis, M.E. Colvin, T.L. Welker, and D.A. James.** 2015. Science information to support Missouri River *Scaphirhynchus albus* (pallid sturgeon) effects analysis: [U.S. Geological Survey Open-File Report 2015-1226](#), 78 p.

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