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An Ancient Fish, the Pacific Lamprey

Tim Cochnauer, Fishery Research Biologist, Idaho Department of Fish and Game

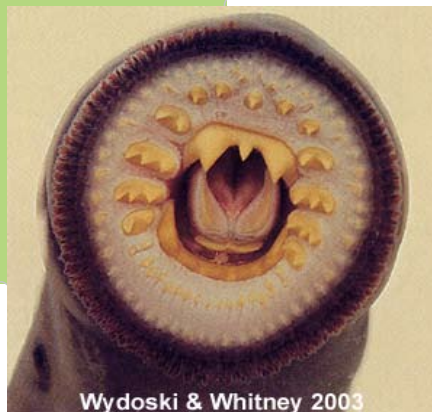
One of Idaho's three dozen native fishes, the Pacific lamprey is anything but of the norm. Lampreys are one of only two groups of living fishes worldwide that are without jaws. They are also the oldest fish alive today with a fossil record that dates some 400 million years. Because of their elongated body structure, lamprey are often confused with the eels. While the outward body structure of both the eels and lamprey are easily comparable, the similarity stops there. Unlike the eels, lamprey are jawless, possesses no paired fins (pectoral and pelvic), have no scales, and have numerous gill openings rather than a single opercula-like structure over their gills.

The jawless mouth structure is noted in the Pacific lamprey's scientific name, *Lampetra tridentata*, literally meaning 'stone-sucker with three teeth'. Without jaws, adult lamprey possess a fleshy oral disk shaped mouth with numerous tooth-like plates of keratin that cover the disk and tongue. This modified mouth allows these fish to move not only by swimming motions but also by grabbing or sucking onto hard surfaces. In addition the disk shaped mouth serves the fish well during the parasitic adult life form.

The Pacific lamprey is one of 40 plus species of lamprey world-wide and only one of three species in the Pacific Northwest. Pacific lamprey is the only species found in Idaho waters. Its uniqueness is not only derived from it primitive structure and early appearance in the fossil record, but also in it life history.

Pacific lamprey has an anadromous life history strategy very much similar to Idaho's salmon and steelhead. They complete their adult

continued . . .



Wydoski & Whitney 2003

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Tim Cochnauer, Fishery Research Biologist, IDFG

How do you eat without jaws?

2 Peculiar Picid

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Spring weather is perfect for outdoor activities - See Wildlife Events calendar!



rearing portion of their life in the ocean, returning only to spawn in freshwater streams. Adult Pacific lamprey construct redds in which they lay eggs, not only by body movement but also by moving larger rocks with their suction-like mouth; hence the term stone-sucker.

Like salmon, Pacific lamprey die after spawning. After hatching, young Pacific lamprey (now called ammocoetes) rear in soft stream bottom material for up to seven years while filter feeding on organic matter. After this extended freshwater rearing phase they transform into an adult-like form, complete with parasitic-adapted mouth, called a macrophthalmia. This phase migrates downstream headed to the Pacific Ocean where they attach themselves to a variety of marine fish and mammals with its teeth. Their sharp-edged tongue is used to make a hole in their host animal which allows the lamprey to feed on blood and other bodily fluids. In the marine environment these macrophthalmia rear and grow into adults for a period of one or two years before they begin their migration to freshwater spawning grounds in Idaho streams.



A close-up view of the Pacific lamprey; photo courtesy of Richard Hibpshman

Recent work by the Idaho Department of Fish and Game, funded by the Bonneville Power Administration and the Bureau of Land Management, has shown the most viable Pacific lamprey populations are limited to streams associated with wilderness areas in Idaho. These streams, such as the Lochsa, Middle Fork Salmon, and Selway rivers, provide the highest water quality and habitat diversity. While the Pacific lamprey were probably found

historically throughout Idaho, the present day distribution is limited in about 40% of the available habitat.

The lack of abundance of Pacific lamprey are reflective of declining numbers of adults counted over lower Snake River and Columbia dams. At the old Lewiston Dam (removed in 1972) over 5,000 adult lampreys were counted in 1950. In 2007, only 34 adults were document passing Lower Granite Dam (the last dam on the lower Snake River before entering Idaho's waters).

While the Pacific lamprey have drawn relative little attention, their importance should not be slighted. This fish has played an important role in subsistence and ceremonial culture of Native Americans in the Pacific Northwest. Perhaps just as importance is their role in the energy flow in stream systems. Their input of extraordinary high caloric content and marine derived nutrients has played a role in elevated nutrient levels in Idaho's anadromous fish waters.

While their future may look bleak, their survival over millions of years has shown their resilience through changing environments of the earth. While Idaho's still possesses substantial amounts of high quality stream habitat, this alone cannot compensate for the high mortality suffered while migrating through the eight hydroelectric facilities on the lower Snake and Columbia rivers. Only time will tell if work by various state, federal, and tribal entities to improve passage conditions through dam and associated reservoirs will reverse the declining trend of this unique native fish species in Idaho.

Volunteers Wanted for OspreyWatch Program

by Beth Waterbury, Nongame Biologist-Salmon Region

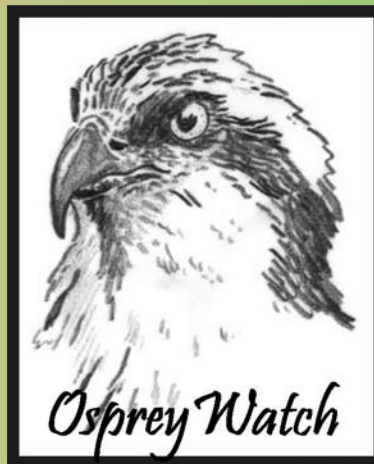
SALMON- In another month, adult osprey pairs will return to the Salmon River after a six-month hiatus in southern Mexico and Central America. This year, Idaho Department of Fish and Game (IDFG) hopes to have a trained team of volunteer scientists at-the-ready to monitor breeding pairs through OspreyWatch.

OspreyWatch invites interested citizens to observe one or more of Salmon Region's 40+ nest sites from late March through mid-August, the osprey's typical breeding season in east-central Idaho.

Volunteers will record field notes of osprey behavior and activities, including number of chicks hatched and their progress to fledging. Field data will be compiled in the annual Salmon Region Osprey Nesting Report compiled by IDFG's Conservation Sciences Program.

Interested volunteers are invited to attend OspreyWatch training sessions scheduled for Salmon and Challis. Training sessions will include a slide show overview of osprey ecology, field monitoring techniques, and assignment of nests to be monitored.

For more information, contact Beth Waterbury at (208) 756-2271.



The Lewis's Woodpecker: The Peculiar Picid

by Beth Waterbury, Nongame Biologist – Salmon Region
Idaho Department of Fish and Game

Among Idaho's 10 species of breeding woodpeckers, perhaps none is as intriguing as the Lewis's Woodpecker. Trait by trait, this robin-sized bird is unique among members of the woodpecker family—the Picidae. Its distinctive plumage, foraging habits, flight pattern, and courtship displays make it one of the most fascinating and watchable birds in the state.

Lewis's woodpeckers are found in patchy distributions west of the Great Plains. Their principle breeding habitats are open ponderosa pine forest, open riparian woodland dominated by cottonwood, and logged or burned pine forest. They nest throughout Idaho except the southeast corner of the state and typically winter in oak woodland habitats from Oregon, Utah, and Colorado south to the U.S.-Mexico border.

Lewis's woodpeckers share many characteristics typical of the woodpecker family—chisel-like bills used for excavating, zygodactyl toes (two pointing forward, two pointing backward) adapted for tree-climbing, stiff rectrices (tail feathers) used as a prop on vertical surfaces, and long, cylindrical tongues with barbs or brushes at the tip for extracting insect prey.

From here on out, the Lewis's puts its own peculiar "spin" on Picid-ness, beginning with its striking appearance.

Named for famed explorer Meriwether Lewis (who first scientifically described the bird), the Lewis's woodpecker has a distinct glossy, greenish-black tail, back, and wings with a contrasting silvery-gray collar, dark red face, and pinkish or salmon-red lower breast and belly described by Lewis as "a curious mix of white and blood red which has much the appearance of having been artificially painted or stained of that color." Unlike most other woodpeckers, the sexes have similar coloration.

Lewis's woodpeckers have a steadier, more buoyant flight than other woodpeckers, with slower wing-beats and longer glides that can be mistaken for jays or crows. They perform stunning aerial maneuvers as they fly-catch insects from open perches over streams, ponds, or wet meadows. Their gape (the base of

the bill where the mandibles join) is large compared to other Picids, an adaptation shared with other avian insectivores such as swallows, swifts, and nighthawks.

"Woodpecker" is not the most accurate descriptor for the Lewis's. The species is considered a weak excavator and seldom, if ever, does it excavate for wood-boring insects. The Lewis's woodpecker has reduced trunk, neck, and skull rigidity and a longer, thinner bill relative to its more robust family members, making it the "featherweight" of the woodpecker tribe. Its weak excavation morphology may explain its nesting preference for well-decayed snags, including use of natural cavities and refurbishment of old flicker or hairy woodpecker nest holes. Perhaps related to bill morphology, the species has a short, weak drum almost exclusively limited to the courtship period. Researchers believe that the Lewis's calls have supplanted drumming for attracting mates, unlike most other Picids.

Courtship among Lewis's woodpeckers begins soon after birds arrive on breeding grounds in early May. Pairs engage in whirling dervish "circle flight" displays accompanied by lively churr and chatter calls. Circle flights are dizzying, gliding chases around the nest tree ending in "wing-out" displays, in which the perched bird elevates its wings to expose the colorful pinkish-red feathers of the abdomen and flanks. Copulation usually follows these displays.

The female lays a single clutch of 6-7 eggs which are incubated by the male at night and both sexes during the day. Nestlings hatch in about 16 days and fledge in 28-34 days. Fledglings are fed by the parents for several days after leaving the nest. In late August or early September, Lewis's woodpeckers join up in flocks of 10-20 birds and slowly migrate to points south, traveling nomadically at low altitudes through areas with plentiful food supplies. On winter range, Lewis's subsist on acorns, corn, cultivated fruits and nuts, and other mast.

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The Lewis's woodpecker is an Idaho Species of Greatest Conservation Need and holds special conservation status in most western states and provinces. Its sporadic distribution and uncommon status within much of its range confounds efforts to accurately estimate populations. However, broad-scale population trends do show population declines and reductions in distribution since the 1960s. In neighboring Washington state, Lewis's woodpecker is a candidate for endangered species listing by the Washington Department of Fish and Wildlife.

Possible causes for population declines point to loss and alteration of breeding habitat. The two primary breeding habitats for Lewis's woodpeckers—ponderosa pine and deciduous riparian forest—have declined as much as 90% from historic levels across the western states. Fire suppression in pine forests has promoted forests that result in dense stands of young pine and invasion by Douglas fir, which are unsuitable for nesting. Loss of cottonwood forest is attributed to the attrition of standing dead trees and lack of seedling regeneration due to flood control, low

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Windows to Wildlife is a quarterly publication of the Idaho Watchable Wildlife Committee and IDFG Conservation Sciences Program.

Deniz Aygen — Editor

deniz.aygen@idfg.idaho.gov
208•287•2750

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Idaho Department of Fish and Game
Idaho Department of Parks & Recreation
Idaho Power
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Woodpecker continued from page 3

flows, and intense livestock grazing. Other factors include human development—particularly in floodplains and foothills—which encroaches on breeding and overwintering habitat, and possibly nest cavity competition with non-native European starlings.

Key conservation measures for the Lewis's woodpecker include retention of mature trees, large diameter snags, and a well-developed understory in ponderosa pine, riparian cottonwood, and mixed conifer forests. In ponderosa pine forests, periodic low-intensity burns or selective thinning will help maintain the open forest structure and arthropod abundance preferred by Lewis's woodpeckers. In cottonwood forests, local ordinances that establish adequate building setbacks and retention of riparian vegetation will help restore floodplain functions needed for cottonwood regeneration. With widespread public and private support, perhaps these conservation measures will become the "usual" for this particularly unusual woodpecker.



Lewis's woodpecker; © Dave Menke, USFWS



Spring *Wildlife Events*

Idaho Botanical Garden:

2355 N. Penitentiary Rd, Boise. Call (208) 343-8649 to register for all classes

March 25, 7pm- Organic Lawns and Gardens-Life in the Soil (\$10 IBG members, \$15 nonmembers): Learn about the connections between all plant life and the essential biology of soil and show how organic gardening leads to reduced impact from pests, disease and weeds.

Native Plant Appreciation Week-Wildflower Walks: Apr. 26-May 2

April 26, 6.30pm and May 3; 10am: Come join in celebration of our foothills wildflowers during Native Plant Appreciation Week, Botanists will lead participants on a 1.5-2 hour walk on trails behind the Old Penitentiary. Native and not-so-native species will be identified and discussed during the session. Bring water, a jacket, and good walking shoes, but please, no dogs. Please register so an adequate number of guides may be arranged.

May 27, 7pm- A passion for Penstemons (\$10 IBG members, \$15 nonmembers): Want to learn more about growing these beautiful plants? Join us for an evening of Penstemon exploration. We currently have at least 25 species of cultivars growing in the Garden.

Snake River Birds of Prey Festival, May 15-17: Kuna

Experience the unique habitat and birds of the Snake River Birds of Prey National Conservation Area. Field trips, lectures, children's programs, exhibit area, and banquet with keynote speaker are planned for this first annual festival. Visit: www.snakeriverbirdsofpreyfestival.com for more schedule and registration info.

International Migratory Bird Day, May 9

An annual celebration of birds world-wide. This year's theme is "Celebrating Birds in Culture." Celebrations throughout the state will be held on this second Saturday in May.

Visit www.birdday.org to learn more about International Migratory Bird Day.

Treasure Valley area:

MK Nature Center, 600 S. Walnut St., Boise, 10am-4pm: Celebration with live birds, bird banding, and children's games and crafts. Call (208) 334-2225 for more info.

The Foothills Learning Center, 3188 Sunset Peak Rd., Boise, 10am-2pm: Celebrate the amazing population of migratory birds in Hulls Gulch. Guided bird walks, close-up looks at the nests of great horned owls and red-tailed hawks, and an array of kids' activities related to birds. Call (208) 514-3755 for more info.

McCall area:

Contact Diane Evans Mack at IDFG (208) 634-8137 or Terri Bryant at Ponderosa State Park (208) 634-2164 for event details.

Lewiston area:

8am-11.30am at the Moscow Farmers Market: IMBD booth with live birds May 9, 1.30-4.30pm at the Lewiston City Mall: IMBD booth with live birds.

Contact Joel at the Idaho Fish & Game office (208) 799-5010 for more info

Salmon area:

Volunteer on International Migratory Bird Day! Join IDFG's biologist, Beth Waterbury, and help conduct a region-wide Great Blue Heron rookery inventory.

Interested citizen scientists should contact Beth at: (208) 756.2271.

Deer Flat NWR

13751 Upper Embankment Rd., Nampa; call (208)467-9278 for more information.

April 25, 9am-noon- Earth Day Work Day: Celebrate Earth Day by improving wildlife habitat at Deer Flat National Wildlife Refuge. Volunteers needed to pick up litter or remove noxious weeds. For more information or to pre-register, call (208) 467-9278.

June 6, 11am-3pm- Centennial Festival: An event celebrating a century of working together for wildlife at Deer Flat National Wildlife Refuge. Family-friendly festival with live animals, craft activities, and guided walks.

June 13, 10am-2pm- Kids Fishing Day: Lessons on fishing safety, fish ethics, equipment rigging, and casting. Practice the skills learned that day actually fishing! Contact the refuge for more information.

Boise Watershed:

11818 West Joplin Rd., Boise; www.cityofboise.org/Bee/EnvironmentalEducation

WaterShed Weekend Series every third Saturday from 10am-2pm. Free for all ages. Join us for an outdoor walking tour of the Wastewater Treatment Plant at 1 pm.

April 18- Take a snapshot of the health of the Boise River watershed by monitoring water quality. Community groups, schools, families, and individuals are invited to participate in this event. All ages welcome, no experience necessary. Pre-registration is required by April 8. Call 489-1284 or email BoiseWaterShed@cityofboise.org for more information.

May 16- Join the Golden Eagle Audubon Society on a 1/2 mile hike from the W. Boise Wastewater Treatment Plant to a secluded spot along the Boise River. Learn about the importance of our riparian ecosystem and about the birds who call the watershed their home. Children can create tissue-tube binoculars to take along the journey and make bird feeders from recycled materials once they return. Binoculars and hiking attire are advised.

7th Annual Dubois Grouse Days, April 17-18: Dubois, ID

Witness the unusual mating ritual of sage-grouse as males gather on traditional mating territories (leks) and strut their stuff while females wander around looking for their perfect mate! This annual event in eastern Idaho celebrates the shrub-steppe ecosystem and the unique animals which call it home. For more info, call Curtis Keetch at (208) 521- 1357 or visit: www.grousedays.org.



Photo courtesy Bureau of Land Management