

Wildlife Express!

Volume 27/Issue 2

Pacific Lamprey

October 2013



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PACIFIC LAMPREY

There is a



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fascinating fish lurking in the Clearwater and Snake rivers in Idaho. If you see one, you might not believe it is a fish. You may think an eel, snake or some other strange creature is prowling the bottom of the river. The eel-like being you are seeing is a Pacific lamprey.

Pacific lampreys are strange fish. They have long, thin bodies, round sucking mouths and breathing holes instead of gills. They have two back fins, large eyes and one nostril on the top of the head. They don't have scales, jaws or fins on the side of their bodies. They also have no bones! Their bodies are supported by cartilage. Cartilage is the same material that makes up the outside of your ears.

The scientific name for the Pacific lamprey is *Lampetra tridentata*. This means "three-toothed stone sucker." The name makes sense. As adults, they have three large teeth surrounded by a disc of smaller teeth. They also move in a peculiar way. Pacific lampreys are missing side fins. It is difficult to swim and keep steady in moving water with no side fins. To swim, Pacific lampreys wiggle their bodies back and forth. To stop from being swept away in currents, they suck onto rocks with their mouths. They continue this pattern of quickly wiggling and grabbing rocks to move in a stream.

The life cycle of Pacific lampreys is similar to salmon. They are anadromous. An anadromous fish starts its life in freshwater, travels to the ocean to eat and grow, and then travels back to freshwater to lay its eggs. Pacific lampreys dig shallow nests in small gravel by moving their tails quickly back and forth. They move larger rocks out of the way with their mouths. The female lamprey may lay between 10,000 to 200,000 eggs. After the lampreys lay their eggs, they die.

The eggs hatch in a few weeks. The young lampreys don't look much like the adults. They look like worms. At this stage, they are larvae called ammocoetes (am-o-seats). Ammocoetes may stay in the nest for a few days before they swim out and are carried downstream to slower currents. Here the ammocoetes bury themselves head-first in sand and fine sediments. Several generations and ages of ammocoetes live together forming colonies. They stay in the sediments filtering algae for food.

After about five years, the ammocoetes undergo a metamorphosis or change. They turn into macrophthalmia (ma-crop-thal-mi-uh). They develop eyes, a sucking disc with teeth for a mouth and start to migrate to the ocean. Now they are six to 10 inches long. This is an important time for Pacific lampreys because

their bodies need to change from living in freshwater to living in saltwater.

Pacific lampreys live in the ocean for one to three years. While in the ocean, lampreys are parasites. They latch onto the side of a fish or marine mammal with their teeth. The sharp-edged tongue and teeth then make a hole in the animal, and the lampreys suck the blood and bodily fluids from the animal! When full, the lampreys drop off until hungry again. This may sound gross, but lampreys rarely kill an animal. They will leave a scar. Since lampreys eat fluids, they do not need or have a stomach. They just have one long intestine!

In late summer and early autumn, adult Pacific lampreys leave the ocean and start the migration back to the rivers where they hatched. They use their sense of smell to find their way back home. The ammocoetes release pheromones to help the adults find their way home. Pheromones are strong scents. Once they leave the ocean, they will never eat again. They stay in the stream all winter until they are ready to spawn or lay their eggs in the spring. The next generation of this strange and amazing fish will then begin again.

Cultural Importance of Pacific Lamprey

Pacific lampreys are important to Native American cultures.

The Nez Perce call the Pacific lamprey He'esu or eel. Pacific lampreys are important to the Nez Perce for food and medicine. They are also important to them spiritually.

Native Americans catch Pacific lampreys by hand, dip nests or long poles. The fish are boiled, baked or dried. When dried, the fish is reconstituted in boiling water before eating. Pacific lampreys are still a delicacy. Some say many tribal members would chose Pacific lamprey over salmon, if given the choice.

Pacific lampreys also are used as medicines. Oil collected from drying lampreys is put on the skin or other ailing parts of the body. Historically, native peoples used lamprey oil to condition hair and cure earaches.

Spiritually, Pacific lampreys are very important to Native Peoples. Pacific lampreys are mentioned in creation stories (see the Nez Perce creation story in this issue). Pacific lampreys are also mentioned in many of their oral traditions and myths. One oral tradition still passed on to younger generations today explains how the lamprey has no bones or scales and the sucker fish has so many. The two fish wagered a gambling match against one another. Eel kept offering portions of his bones until he was completely out. Eel then started wagering his scales to the victorious sucker. Sucker's fortune would not run out. He soon won all of eel's bones and scales. For this reason, eel has no bones or scales since sucker was so victorious.

A Nez Perce Creation Story

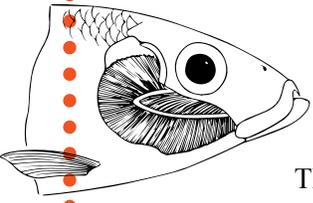
Before the coming of Human Peoples, at a place along the Clearwater River, just down from Lapwai Creek, the Creator called in all the Animal Peoples. The Creator was to give them their names and abilities and to ask what each would give to assist those who were about to arrive. All came - the birds, the fishes, the animals, even the insects. One animal came forward and said, "I'll offer my horns to make arrow points and my skin to fashion a hide for clothing." He was named "Deer." And so it went.

When it came to the fishes, two came forward and said, "we can offer our flesh to the Human Peoples." One said, "We'll come up the river only at certain times, and before we die, we will offer our bodies to the Human Peoples for food." And the other added, "I'll come in the winter, and also give them something special. They can use my skin as a glue to make their bows and spears." They were named "Nacox" - "Chinook Salmon" and "He yey" - "Steelhead." Then another fish came forward and said, "I'll look a lot like Steelhead, but I'll not go to the ocean. I'll stay here in the waters year-round. In the winter, I'll be down in the gravel, and if the Human Peoples need me for food, I'll always offer myself to them." He was named "Trout." Then another fish came out and said, "I don't want to be like the Salmon, Steelhead and Trout. I want a long body and when I rest, I'll put my mouth on the rocks. I'll still come up river every year and the Human Peoples can use my flesh for food." He was given the name "He'esu" - "Eel."

So Deer, Eagle, Salmon and Steelhead, and the other Animal Peoples were given their names and special abilities, each offering their special "gift" to the Human Peoples about to arrive. When Coyote finally arrived, he wanted the name of Eagle or Bear, but they were already taken. He had to settle for "Coyote," and that is why he is as he is. And there were some of the "large animals" that were really late to the meeting, so the Creator turned them to stone and hence the creation of "rocks." There can be a price to pay for being late!



What's a Fish?



Fish are vertebrates.

They have backbones, just like you.

Fish also breathe through gills, have fins and live in water. That seems pretty simple, right? Well, in nature things aren't always as simple as we would like.

Take the backbone for example. We know what our backbone is like, but in the fish world, not all backbones are created equal.

Sharks, sturgeons and lampreys have a backbone made of the same stuff that supports your nose and ears! It is called cartilage. Cartilage is not hard at all!

Fish need oxygen to survive. Most fish have a special way to get oxygen out of the water they live in – gills. Water, with oxygen in it, passes over the gills when the fish swims. The skin on the gills is thin. Oxygen can pass through the skin into the fish's bloodstream.

Does this mean that all fish use gills to get the oxygen they need? No, some fish actually have lungs! In fact, the African lungfish needs to breathe air above the water's surface. It will "drown" if held under water for too long. The

Australian lungfish can survive out of water for months if it is in a wet burrow. Lungfishes are examples of fish that break the "gill rule."

We usually think of fish as having fins on each side of their bodies, but what about lampreys? Lampreys look like eels. They don't have paired fins or jaws, but they are still fish.

As you can see, a simple job like defining what a fish is, is not so simple. Fish have been a part of our planet for at least 450 million years. There are over 20,000 different species or kinds of fish worldwide. Over time, they have adapted to many underwater (and even out of water) habitats.

Pesky Parasites

When you think of a parasite, what jumps into your mind? Do you think of your brother or sister trying to sneak a cookie from your plate? Do you think of a small, creepy insect living in your hair and sucking your blood? Both your sibling and the insect may make you think "ick," but both share a relationship with you.

All things in an environment are connected in some way. When the connection or relationship is close, it is called a "symbiotic" relationship. There are three types of symbiotic relationships. One is commensalism. This is a relationship where one organism gets food or shelter from another organism but doesn't harm it or offer any benefits. Hermit crabs and snails have this relationship.

Hermit crabs use shells made by snails that are left behind after the snail has died. The crab gets protection from the shell. The snail is not harmed by the crab, but it also doesn't get any benefits from the crab using the shell. Mutualism is a relationship where both organisms benefit. Most flowers and bees have this relationship. When bees drink nectar from flowers, they get a meal and the flower is pollinated. Parasitism is a relationship where one organism gets benefits from another organism often causing some sort of injury. Lampreys are parasites when in the ocean. They survive on the bodily fluids of other fish. The organism doing the harm is called the parasite. The organism being harmed is called the host.

Parasites may be found living on and in animals. Parasites that live

in or on the skin and hair are called ectoparasites. Ecto means outside. Ectoparasites are usually insects or arachnids. Ticks and mites are types of arachnids. Flies, fleas and lice are insects. Parasites that live in an animal's organs are called endoparasites. Endo means inside. They often look like worms. Tapeworms, flatworms and round worms are all types of endoparasites.

Parasites may make your skin crawl, but they are a natural part of nature. Most wild animals have parasites. Even humans carry parasites. It is hard to find an animal or plant that doesn't have at least one parasite. Parasites are creatures that have developed interesting and brilliant ways to thrive and grow.



Pucker Up!



There are about 20,000 different species of fish that live on Earth. That's a lot of fish! Every fish is specially adapted to live in its habitat. A fish's mouth can tell you a lot about its habitat, and what it likes to eat.

A sturgeon's mouth is found under its head. The upper lip is longer than the lower lip, and it is rounded down. A sturgeon looks down for its food and this shape helps it suck up its lunch.

Other fish have a lower jaw that is longer than the upper jaw. A barracuda has a mouth like that. Barracuda live in the ocean. They have long, thin mouths with

lots of sharp pointy teeth. Barracuda like to eat other fish that they see swimming above their heads. A small upper jaw lets them see their food clearly.

Have you ever caught a carp or sucker? They look like they are puckered up and ready for a kiss all the time! Their lips are large with rounded edges. Puckered lips are perfect for grabbing small plants and animals, which is just what these fish like to eat.

Some fish look like they have duckbills. Pike are large, predatory fish. They love to eat other fish. Have you grabbed a hold of a fish before? It can be difficult to get a good grip with the slime that covers fish. A pike's mouth might look like a duck's bill, but it has something ducks don't have on their bills – teeth! Pike open their big mouths and slam down on the fish. It's almost like closing a door on the fish.

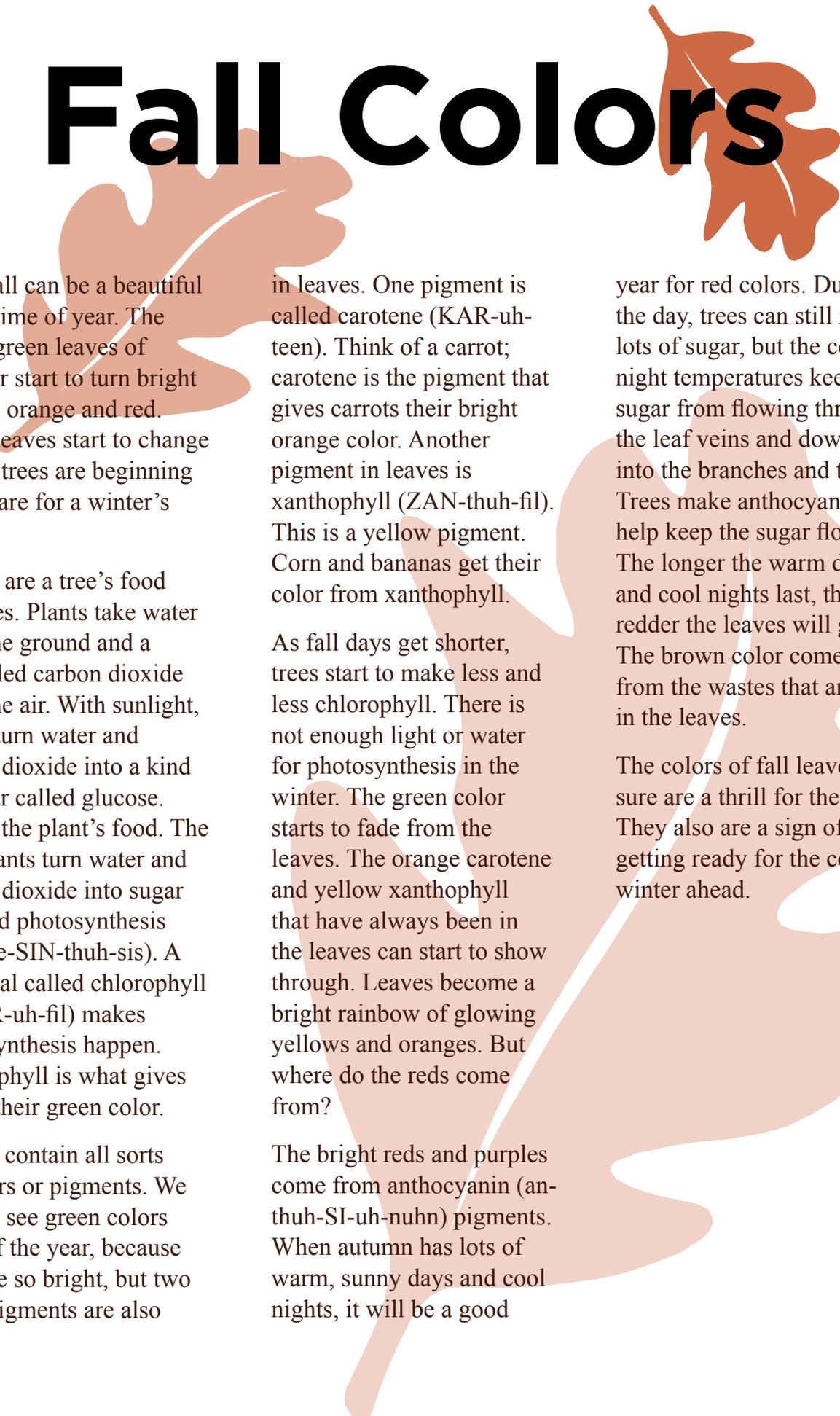
Bass are gulp feeders. You need a large mouth to gulp food, and bass have a mouth that is huge. A bass

will swim up behind a fish, crayfish or other creature, open its mouth, and surround its prey. Bass gulp up not only the prey, but also a big mouth of water. The water is pushed out of the mouth and flows over the gills.

Let's not forget the Pacific lampreys! Their mouths look like something you might see in a scary movie. Their mouths are round, suction-cup circles with teeth and right in the middle – three large teeth that look a bit like vampire fangs. It is enough to frighten anyone! Pacific lampreys' mouths might make you say "Yew," but it is the perfect design for latching into a fish and sucking its blood!

Fish sure have some interesting mouths. Next time you catch a fish, look at its mouth and think about how that shape helps it get its food.

Fall Colors



Fall can be a beautiful time of year. The green leaves of summer start to turn bright yellow, orange and red. When leaves start to change colors, trees are beginning to prepare for a winter's rest.

Leaves are a tree's food factories. Plants take water from the ground and a gas called carbon dioxide from the air. With sunlight, plants turn water and carbon dioxide into a kind of sugar called glucose. This is the plant's food. The way plants turn water and carbon dioxide into sugar is called photosynthesis (foe-toe-SIN-thuh-sis). A chemical called chlorophyll (KLOR-uh-fil) makes photosynthesis happen. Chlorophyll is what gives plants their green color.

Leaves contain all sorts of colors or pigments. We usually see green colors most of the year, because they are so bright, but two other pigments are also

in leaves. One pigment is called carotene (KAR-uh-teen). Think of a carrot; carotene is the pigment that gives carrots their bright orange color. Another pigment in leaves is xanthophyll (ZAN-thuh-fil). This is a yellow pigment. Corn and bananas get their color from xanthophyll.

As fall days get shorter, trees start to make less and less chlorophyll. There is not enough light or water for photosynthesis in the winter. The green color starts to fade from the leaves. The orange carotene and yellow xanthophyll that have always been in the leaves can start to show through. Leaves become a bright rainbow of glowing yellows and oranges. But where do the reds come from?

The bright reds and purples come from anthocyanin (an-thuh-SI-uh-nuhn) pigments. When autumn has lots of warm, sunny days and cool nights, it will be a good

year for red colors. During the day, trees can still make lots of sugar, but the cool night temperatures keep the sugar from flowing through the leaf veins and down into the branches and trunk. Trees make anthocyanin to help keep the sugar flowing. The longer the warm days and cool nights last, the redder the leaves will get. The brown color comes from the wastes that are left in the leaves.

The colors of fall leaves sure are a thrill for the eye. They also are a sign of trees getting ready for the cold winter ahead.

BE OUTSIDE:

Preserving a Bit of Autumn

Autumn is a perfect time to go outside. It is fun to see the changes that happen during this time of year, especially in leaves. Have you noticed a tree in your neighborhood that has started to prepare for the winter? The green leaves of summer start to turn bright yellow, orange and red as trees start to shut down their food factories – their leaves.

Find a tree and write down the changes that you notice over the next few weeks. You might be amazed by the changes that happen in just a few days! You can even preserve the changes that you see. Ask an adult to help you gather materials and lend a hand.

You need:

- Freshly fallen or picked leaves or branches
- A small bottle of glycerin – You can find this at your local drugstore in the skin-care or first-aid section.

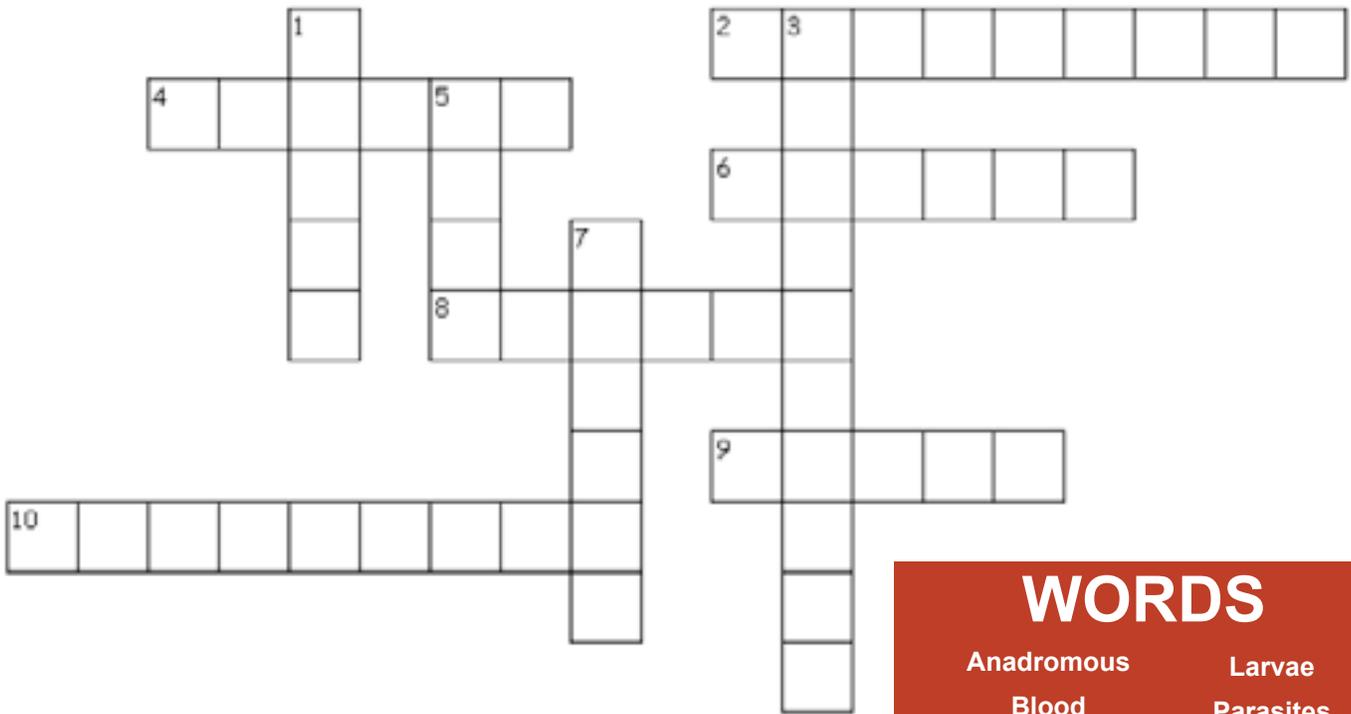
- Empty jars
- Hot water
- Newspaper to protect your work surface

Spread out several layers of newspaper. Stir together in a jar one part glycerin and three parts hot water. For example, if you use $\frac{1}{3}$ cup of glycerin you will need $\frac{3}{4}$ cup of hot water. Clip the stems of the leaves and branches a tiny bit and place them in the mixture. Make sure only the stems touch the solution (if the leaves touch the solution, they will turn black). Leave the stems in the solution for about a week. Your leaves should look “fresh picked” for many years.



BE OUTSIDE
IDAHO CHILDREN IN NATURE

Pacific Lamprey Puzzle



WORDS

Anadromous	Larvae
Blood	Parasites
Cartilage	Scales
Eyes	Smell
Filter	Sucker

ACROSS

2. Adult Pacific lampreys are _____.
4. Pacific lamprey larvae _____ algae for food.
6. Ammocoetes are Pacific lamprey _____.
8. The scientific name for Pacific lamprey means three-toothed _____ stone _____.
9. Pacific lampreys use their sense of _____ to find their _____ way back to Idaho from the ocean.
10. This supports a lamprey's body.

DOWN

1. Adult Pacific lamprey suck the _____ from other fish and _____ marine mammals.
3. Pacific lampreys live both in freshwater and in saltwater. They are _____.
5. Pacific lamprey larvae have no _____.
7. Pacific lampreys do not have _____.

WILDLIFE EXPRESS

Volume 27 • Issue 2 • Pacific Lamprey • October 2013

Wildlife Express is published nine times a year (September-May) by the Idaho Department of Fish and Game. Classroom subscriptions and an Educator's Guide are available for \$45.00 per year and includes a classroom set of 30 copies mailed to your school each month. Subscriptions of 10 copies or less are available for \$25.00. This publication is made possible through the sale of wildlife license plates.

For more information, call or write: Wildlife Express, Idaho Department of Fish and Game, 600 South Walnut, PO Box 25, Boise, Idaho, 83707 (208) 287-2890.

Lead Writers: Adare Evans Layout: Kelly Kennedy Yokoyama Contributor: Lori Adams, Vicky Runnoe
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