Wildlife Express

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Lamprey

Inside

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Pacific Lamprey

There is a 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 *Entosphenus tridentatus*. 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 macropthalmia (might-kroff-THAL-mee-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. They are mentioned in creation stories and 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.

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.

What is a Sea Lamprey?

Photo: CC-BY NOAA Great Lakes at Flickr Creative Common

When people hear about Idaho's native Pacific lamprey, they often think it is the same species as the sea lamprey. While the species look very similar and share similar life cycles, the sea lamprey is a different species of fish.

Sea lamprey are native to the Atlantic Ocean. Like the Pacific lamprey, they are parasites on fish in the ocean. They feed on the blood and body fluids of fish and then drop off. The fish survive and usually do not die.

In the 1830s, sea lamprey began to be seen in Lake Ontario. This is the eastern-most of the Great Lakes. Niagara Falls served as a barrier to keep sea lamprey from invading the rest of the Great Lakes. However, in the early 1900s, people built a canal system to bypass the falls. These were meant to help with shipping. The canals helped boats safely get around the falls. They also provided sea lamprey with a way to move into the other Great Lakes. By 1938, they had invaded all the Great Lakes. This sea lamprey invasion has caused big trouble for Great Lakes fishes. It has also hurt Great Lakes fisheries.

Because the sea lamprey is native to the Atlantic Ocean, the species evolved along with fishes that live in that ocean. They are adapted to one another. Sea lamprey may be a pesky parasite, but they do not kill the fish they feed on. In the Great Lakes, however, the native fish are not adapted to having sea lamprey around. When they get a lamprey attach to them, many fish die.

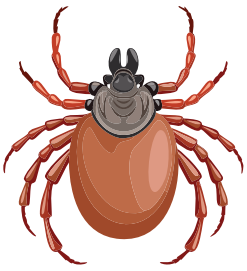
Sea lamprey in the Great Lakes have become predators of the native fishes. In fact, a single lamprey can kill up to 40 pounds of fish in a year. Lake trout, lake whitefish, cisco, burbot, walleye and other fishes have been affected. Their populations have dropped significantly. Both sport and commercial fishermen have been affected. Fortunately, the Great Lakes Fishery Commission works with agencies in Canada and the U.S. to control sea lamprey. Larval forms of the sea lamprey are killed. Adults are trapped. These measures have helped, but sea lamprey remain a concern in the Great Lakes. They are an example of how an animal from one place can cause real trouble in other places where they do not belong.

Photo: CC-BY NYS DEC at Flickr Creative Commons

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.

Preserving Autumn

BE OUTSIDE
IDAHO CHILDREN IN NATURE

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.

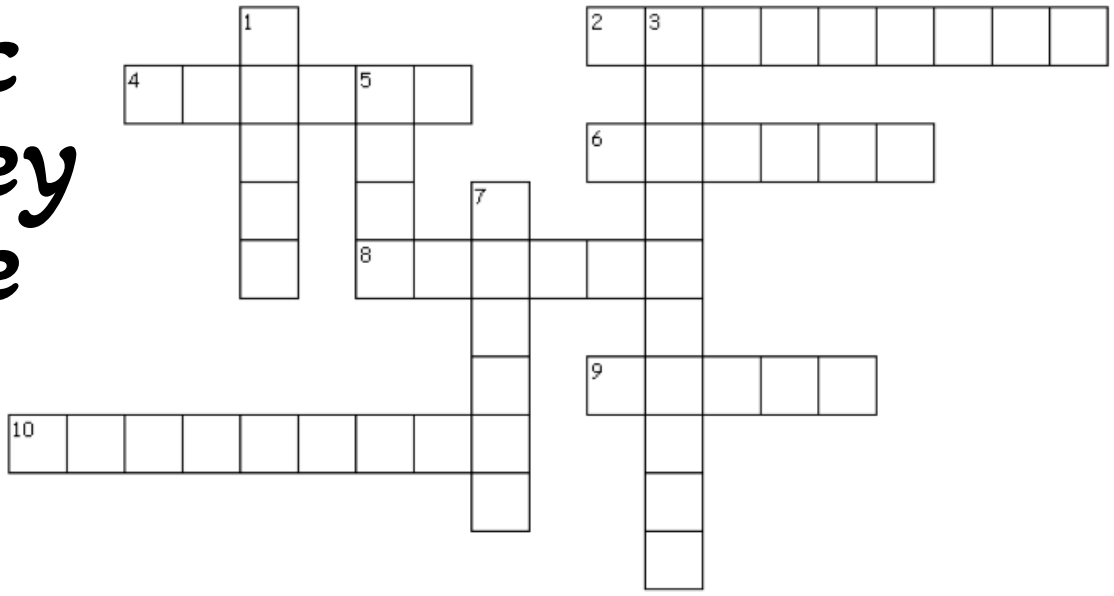
Find a tree and write down the changes that you notice over the next few weeks. You might be amazed by the changes that happen in just a few days! You can even preserve the changes that you see. Ask an adult to help you gather materials and lend a hand.

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 two parts hot water. For example, if you use 1/2 cup of glycerin you will need 1 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.

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 _____.

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WE WOULD LIKE TO HEAR FROM YOU!

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