

Wildlife Express!

Volume 19

Issue 5

January 2006



**Scootin'
Sculpin**



Let's Look at...



Sculpin

Have you ever been looking into a stream and thought you saw a rock hop? You may have thought that your eyes were playing tricks on you, but you could have been looking at a sculpin. These little fish look a bit like rocks, and they do hop! At least it looks like they are hopping.

There are lots of different species of sculpin in the world. Many sculpin live in salt water, but some live in fresh water. Salt water sculpin may reach lengths up to two feet. Fresh water sculpin are small. They usually don't grow longer than six inches.

Sculpin are a bit different from other fish. They don't have scales or swim bladders. Swim bladders help fish float and move up and down in the water. Since sculpin don't have swim bladders, they spend almost all of their time on the bottoms of rivers, streams and lakes. It's hard to swim if you don't have a swim bladder. That's why it looks like sculpin are hopping when they swim. Their front fins stick out from the sides of their bodies like little feet. They hold themselves up on their fins and use the fins to scoot across rocks. These fins are also great for holding onto slippery rocks.

Sculpin bodies are perfect for sitting on the bottom of fast flowing streams. Their heads are big, broad and flat, and their bodies taper into a narrow tail. This shape, sort of like a teardrop, helps them hug rocks. They are less likely to get moved around by the river's current.

Sculpin are well **camouflaged** (KAM-e-flazhd); they blend into the rocks around them. This is really important, because many larger fish eat sculpin. Looking like a rock also helps sculpin catch their favorite food – insects.

Sculpin spawn or lay their eggs in spring. The male chooses a nesting spot under a rock or log. He guards his spot from other males and will fight to keep it. Once a male sculpin has his spot ready, he tries to get the attention of a female. The male may shake his head and dart quickly around the nest. He may even bite the female and pull her toward the nest! The female lays her eggs on the underside of the rocks in the nest. She is upside down while laying hundreds of eggs! The male guards the nest as the eggs develop and will stay there until the young are ready to leave. Male sculpin are devoted and determined fathers.

Sculpin are important to the ecology of a stream. Not only are they important parts of the food web, but they also are telling scientists if rivers are healthy. Sculpin are affected by even small changes in water. Sculpin are called **indicator species**. They "indicate" a problem. Their changes in behavior or population size help scientists figure out if rivers or lakes are polluted.

Sculpin are fantastic fish. With their fat lips, big heads and scooter fins, you might even think they are cute!

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 them to be.

Take the backbone for example. We know what our backbone is like, but in the fish world, not all backbones are created equal. Sharks and sturgeon 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 is so dependent upon breathing air above the water's surface that it will "drown" if kept under water. 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, and they are still fish. In fact, lampreys represent some of the first fresh water fish to appear on Earth.

So 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 450 million years. There are over 20,000 different kinds of fish worldwide. Over time, they have adapted to many underwater (and even out of water) habitats.



Fish and Winter

What happens to fish in the winter? If you are wondering about this question, you are not the only one! Many people wonder what happens to fish during the cold winter months.

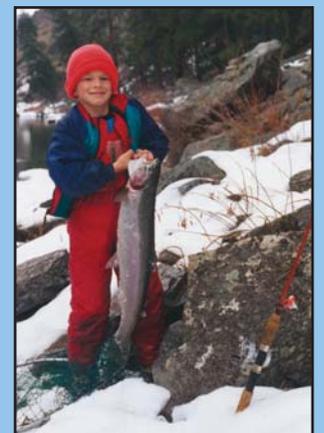
Most fish are cold-blooded. Their body temperatures are the same as the temperature of the water they live in. Only tunas and mackerel sharks are able to keep their body temperatures much higher than the water around them. So what happens to fish when ice starts to form on top of the water and winter shows its bitter side?

Ice acts like a lid on top of the water. Light and oxygen can't get through the ice. Not only fish are affected, but everything living under the ice is, too.

One thing that ice can do is lower the amount of oxygen in the water. Fish and other animals that live in the water need oxygen to survive. One way oxygen gets into the water is by waves and splashes. Water can't move if it is covered by a blanket of ice, so less oxygen gets into the water to replace the oxygen used by animals. To lessen the amount of oxygen they use, fish and other animals slow down. They become less active, so they use less oxygen. Some animals enter a sort of hibernation.

Just like many trees drop their leaves in the fall, so do many water plants. Plants need sunlight to make food. Ice acts like a curtain on top of a pond. It keeps much of the light from entering the water. This causes many plants to stop making food. Their leaves drop off. Sometimes even the stems die off. With their leaves gone, plants shut down and rest for the winter. Plants are no longer making oxygen. This can further decrease the amount of oxygen in the water. If there is not enough oxygen in the water, fish may begin to die. When this happens, it is called a winterkill.

Next time you see a pond or lake in the winter, think about the creatures living in it. What are the animals going through to try a make it through the winter?



Cold Fins



Sculpin are fish that like their fins to be cold. They like to live in cold, clean water. Cold water is different from warm water. More than just the temperature is different.

One big difference is cold water can hold onto more oxygen than warm water. Fish that live in cold water habitats usually have no problem getting all the oxygen they need from the water. Cold water is also usually a bit cleaner and clearer.

Cutthroat trout, our state fish, is an example of a fish that lives in cold water habitats. They need clean water with lots of oxygen in it. Water like this is usually found in mountain streams, lakes and

streams that start as springs.

Trout like clear water, but they don't like to see their neighbors. Trout can live pretty close to each other. They just need enough food and a "wall" between them. Fallen logs or rocks make nice "walls" between neighbors. Good cold water habitats need fallen logs, rocks or other plants to give fish hiding places.

Usually cold water is moving. The Boise River, Salmon River and Selway River would be examples of cold water habitats.

Warm Fins

Some fish like their fins to be warm. You can find warm water habitats in shallow ponds where the sun warms the water and in some places in southern Idaho.

Warm water usually has less oxygen in it. The warmer water gets the harder it is for water to hold onto oxygen. Warm water usually has fish living in it that have interesting ways to get the oxygen they need.

Catfish, called brown bullheads, are fish that you can find living in warm water. Bullheads can breathe through their skin. They can even use their air bladders as an emergency lung by coming up to the surface of the water and gulping air. They hold the air in their air bladders then "burp" the air out. The air can pass over their gills, so they can get oxygen out of the air. Pretty amazing!

Warm water is usually murky. This is where the catfish's whiskers come in handy. Their whiskers help them find their way around and "smell" the water for food.

Water warm is usually still. Farm ponds, shallow ponds and reservoirs on the lower part of the Snake River are examples of warm water habitats.



Ecology

Ecology is a big word. Ecology is the study of how living things and nonliving things interact and depend on each other. If you break down the word ecology, “eco” means house and “logos” means study. Ecology is the study of our house – Planet Earth.

When ecologists study certain areas, they call them ecosystems. This includes all living and nonliving things. Living things might be plants, animals, bacteria and fungi. Nonliving things include sunlight, soil, air and water. An ecosystem might be as small as a puddle with only a few organisms interacting, or it might be as large as a river with many organisms.

One thing all living organisms need to do is find energy. All living things need energy to survive. The main source of energy on Earth comes from the sun. Plants use light from the sun to make food. Organisms that use the sun to make food are called producers. Grass, trees and algae are producers.

Organisms that get energy from other animals are called consumers. This makes a food chain. There are four different kinds of consumers. Herbivores eat plants. Carnivores eat meat. Omnivores eat both plants and meat. Decomposers feed on dead plants and animals. Most consumers and decomposers get energy from more than one kind of food. Overlapping food chains make food webs.

An ecosystem is a complex thing. All parts of the system are important. If one part is removed, many things are affected. Sculpin are very important to stream ecosystems. They eat insects, fish eggs and smaller fish. Trout and birds may eat sculpin. The trout might be eaten by an eagle, osprey or heron. If the sculpin is missing, it could affect not only trout that eat sculpin, but also osprey that eat trout.

Everything is connected. Studying ecology helps people see how they are connected to the world. If sculpin disappear, how might that affect you?



Bald eagle, top of the food chain
©Joe Fuhrman

Fish Folks

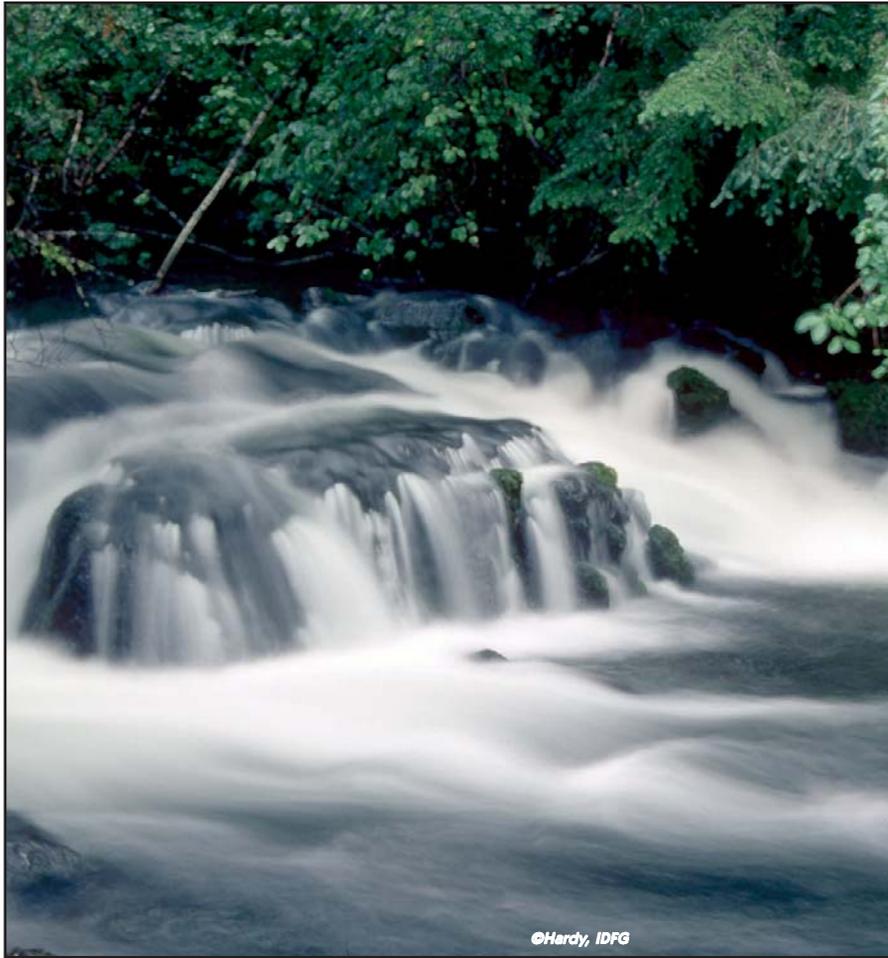
Who would want to think about fish all day? Could this be a real job? There are many different types of jobs that help fish. Fish biologists go to college to learn about fish and everything they need to survive. Many of these fish biologists belong to a group called the American Fisheries Society (AFS).

The AFS works together to help fish and make sure that fish habitats stay healthy. The State of Idaho has a chapter (group) of the AFS that help fish in our state. The Idaho chapter of AFS supports projects that teach people about fish. They helped to pay for this *Wildlife Express* to teach you about sculpin! AFS also tries to make sure that people know what fish need to be healthy. That way people will know what to do to protect fish. AFS not only cares about fish that people might like to catch and eat, they also care about small fish like sculpin. Trout and other fish eat sculpin. Sculpin are also important, because they like clean water. If sculpin are in a stream, chances are the stream is safe for people, too.

Do you think you might like to be a fish biologist? Fish biologists have many different jobs. Some work with fish in the ocean. Others are experts in fish nutrition. They know what fish need to eat to stay healthy. Some people raise fish. Many of the rainbow trout that people catch in Idaho streams started their lives in a fish hatchery. Conservation officers are sometimes fish biologists. They enforce laws about catching fish and keeping fish safe.

These are just some examples of jobs that help fish and help people understand fish. The AFS tries to make sure that fish will always be here for everyone to enjoy. So the next time you see a fish in a lake or in the grocery store, think about the people that worked hard to make sure that the fish was there.





Water, Water Everywhere...

Water is water, right? Well, sort of. All water is a combination of oxygen and hydrogen, but sometimes water has other things in it. What really comes to mind is salt.

If you have ever been swimming in the ocean and got a big mouth full of water, you experienced something that makes ocean water special. It's salty! The salty water of the oceans covers three-fourths of the Earth's surface. The oceans are so old that, over time, minerals have dissolved into the water. This is why it tastes salty. Most of the salt in the oceans is the same as the salt you put on your food. When water evaporates from the surface of the ocean, the salt stays behind. There is so much salt in the oceans that if all the water dried up, you would have enough salt to build a 180-mile-tall, one-mile-thick wall around the equator. That's a lot of salt!

There are many differences between salt water and fresh water. The biggest, of course, is salt. All water, even fresh water, has salt dissolved in it. Salt water just has much more salt than fresh water. Because of the salt, salt water must be colder than fresh water to freeze. Salt water also needs to be hotter than fresh water to boil. Salt water is also denser than fresh water. It is easier to float in the ocean than it is in a fresh water lake. All the salt helps to hold you up. Salt water also tends to pull moisture out of things. Is your skin dry and itchy after swimming in the ocean?

Living in salt water is different than living in fresh water. Fish living in salt water need to get rid of all the salt that enters their bodies. They often can get rid of salt through their gills, and their urine is very salty compared to fresh water fish. This is just one thing that salt water fish have to deal with that fresh water fish don't. Can you think of other differences?

Animal Hide & Seek

Sometimes sticks walk, leaves hop and rocks crawl. Of course, these things really can't hop or crawl, but sometimes it sure looks like they're moving. Often when we are seeing a stick crawl, it's actually an animal.

Camouflage (KAM-e-flazh) means to blend in with your surroundings and hide. It is a type of disguise (dis-GIIZ). Camouflage may be a certain color, pattern of colors, or a special shape that fools the eye. Camouflage may help an animal to hide, or it may help a hunter to sneak up on its prey.

Sculpin camouflage themselves very well against the rocky bottoms of streams. Looking like rocks helps sculpin protect them from larger fish that think they make tasty treats. Sculpin also have an easier time grabbing the insects and fish they like to munch.

Many animals change their colors with the seasons. Animals that change color to match their background are using **cryptic** (KRIP-tik) coloration. This is what weasels and snowshoe hares do. When snow starts to fall, their coats gradually turn white to match.

Animals may even change colors and patterns throughout their lives. Deer fawns are born with tan coats that have white spots. The spots match the sun and shade that dapple the tall grasses where the fawns hide. As long as the fawns do not move, predators will have a difficult time seeing them. As deer fawns grow older and can run faster to escape danger, the spots fade away.

Do you think zebras are camouflaged? They are not camouflaged for our eyes. Their black and white stripes stick out against the grasses of Africa, but that is not true for lions' eyes. Lions have a difficult time seeing some colors. Grasses and trees look like shades of gray, so the zebras' stripes help them to blend into the tall grasses. This helps the zebras avoid becoming a lion's meal.

Whether hunter or hunted, camouflage helps animals to survive.



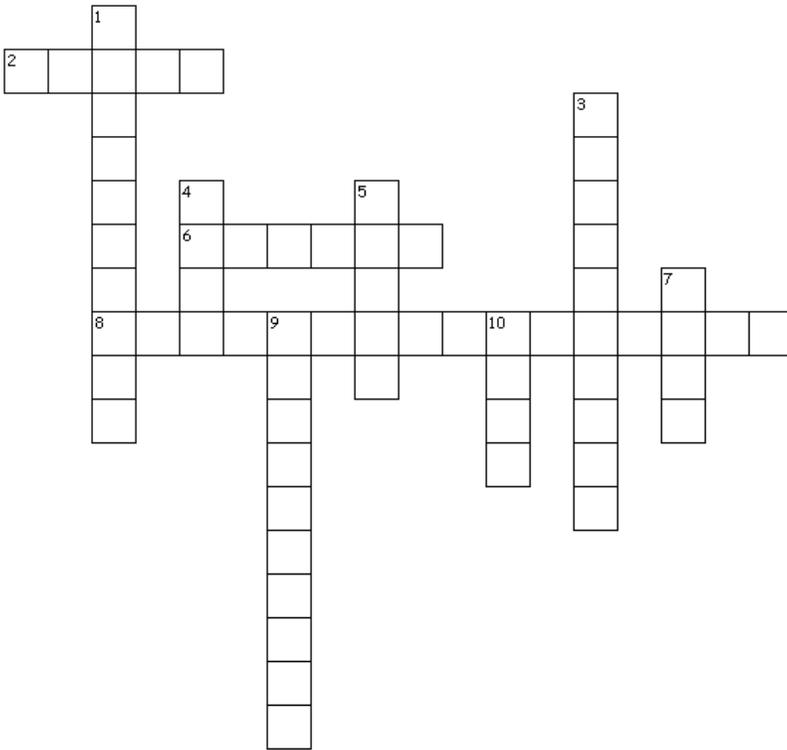
grasshopper



snowshoe hare



Sculpin Criss-Cross



Across

2. Sculpin are eaten by this fish.
6. Fish need this to survive.
8. Sculpin are called this, because their changes can let people know if water is unsafe.

Down

1. Sculpin are important links in many of these.
3. Female sculpin are in this position when laying eggs.
4. Sculpin like water to be this temperature.
5. Male sculpin build and guard these.
7. These help sculpin hold onto rocks.
9. To blend in and hide.
10. A type of bladder a sculpin doesn't have.

WORDS

fins	indicator species	nests
food chains	upside down swim	
camouflage	trout	oxygen
		cold

WILDLIFE EXPRESS

Volume 19 • Issue 5 • *Sculpin* •
January • 2006

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 \$30.00 per year and includes a classroom set of 30 copies mailed to your school each month. Subscriptions of five copies or less are available for \$10.00.

Wildlife Express is also available on the Idaho Department of Fish and Game website at no charge at <http://fishandgame.idaho.gov> For more information, call or write: *Wildlife Express*, Idaho Department of Fish and Game, 600 South Walnut, PO Box 25, Boise, Idaho, 83707 (208) 287-2874.

Lead Writers: Adare Evans

Layout and Design: Alyssa Jones

Contributors: Kevin Frailey • Renai Brogdon • Cristina Watson • Lauri Monnet



WE WOULD LIKE TO HEAR FROM YOU !

If you have a letter, poem or question for *Wildlife Express*, it may be included in a future issue! Send it to the address printed above!