Wildlife Express

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Microfishes

Inside

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Fish come in all shapes and sizes. Some are large and others are small. And some of them are very small. Many of the small fish we see are baby fish. They will grow up to be larger when they are adults. But some of these small fish never grow more than a few inches. While you won't need a microscope to see them, they are often called microfish.

Many microfish are part of the minnow family. Even though all members of this family are not actually minnows, we tend to call all small fishes, minnows. As it turns out, this family of freshwater fish is the largest in the world. Over 2,000 species can be found around the world. About 235 species live in North America and 19 of these can be found in Idaho. This fish family includes minnows but also goldfish and carp. Dace, shiners, and stonerollers are also part of the minnow family. Other kinds of microfish that live in Idaho include sculpin.

As a group, microfish are very important. They are members of food chains and food webs. As small predators, they eat tiny insect larvae living in the water, like mosquito larvae. This can help prevent the spread of diseases that mosquitoes carry. Microfish are eaten by many animals including larger fish. Birds like herons, kingfishers, gulls, and diving ducks such as

mergansers eat microfish. Mammals like mink, otters and raccoons also eat these small fish. And these are just freshwater animals. In the ocean, microfish are eaten by many other kinds of animals from anemones to eels to birds to marine mammals.

Another important role of microfish is that of an indicator species. These are animals or plants that show us the overall health of the habitats where they live. Just like a thermometer can tell you if you have a fever, an indicator species can tell us if their habitat is unhealthy. Indicator species are like a thermometer for their environment. Microfish can show us a lot about the health of the water where they live. Some of them are very sensitive to pollution, water temperature or the amount of sediment in the water. These things can affect all animals and plants dependent upon that water, including people. Scientists do research on microfishes to learn about water quality and how we can help make it better. This makes the water healthier for all living things that need it.

Besides all the important roles of microfishes, they are also quite pretty. Some are eye-catching with brilliant colors and interesting patterns. Many fish species become more colorful during the breeding season. Microfish are no different. Bright colors and patterns help these tiny fish attract a mate in the spring or summer. This summer if you spot some tiny fish, take a closer look. You might be amazed by their flashy colors.

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Meet some native Idaho microfishes!

Northern leatherside chub

Chubs are members of the minnow family. They get their name from their short, chubby body. Some chub species can get fairly large, up to 20 inches or more in length.

The northern leatherside chub is a microfish, growing to about five-to-six inches in length. This chub lives in pools made by slow-moving areas of streams with golf ball-sized rocks on the bottom. Aquatic insects and other small invertebrates like snails are eaten by this little chub. Another important food is plankton. It is made up of tiny plants and animals found in water. Many of these spend their whole life drifting around in the water. The name plankton comes from a Greek word, meaning drifter. Plankton can be broken down into phytoplankton and zooplankton. The suffix phyto means plants, so phytoplankton are tiny plants. Zooplankton are tiny animals. Many microfishes depend on plankton for their food.

Unfortunately, this little chub is rare in our state. It has been designated as a species of greatest conservation need. This means that the chub has a low population, and its habitat has been damaged. While it used to be more common, the northern leatherside chub now lives in only a small part of the Snake River drainage. Habitat loss is thought to be a major reason why this species is rare. Working to help this microfish will also help the other animals that share its aquatic habitat.

Dace

are members of the minnow family found in many Idaho waters. Several species live in Idaho, including leopard dace, speckled dace, and longnose dace. The word dace is a modification of a French word meaning to dart. This describes the quick movements of these little fish in the water. Dace are small, about four inches long. Longnose dace can sometimes grow up to six inches. Like most microfishes, dace are an important food for other animals, including larger fishes and aquatic birds and mammals.

These little fish eat a wide variety of things. Plankton, aquatic insects, freshwater shrimp, snails and terrestrial (tuh-res-TREE-uhl) or land-dwelling insects are all on the menu. Since several species of dace might live in the same stream, they do something called resource partitioning. This is a big term for how similar animals share an ecosystem without causing problems for one another. Dace species live together by eating different foods. Leopard dace eat terrestrial insects. Longnose dace eat aquatic insect larvae. Each species of dace lives in the same ecosystem, but because they eat different foods, they can share the space without competition.

The places in a stream where dace live is another way they partition resources in the same ecosystem. Dace like colder water, but they all do not like the same kind of water flow. Some species like faster water while others prefer slower water. If you're wondering if this has to do with where the daces' food lives, you are right! Water flow does not just affect where prey lives. It also affects how dace reproduce. Some species prefer to build their nest in rocks on the stream bottom. Other dace might hide their eggs in aquatic plants that grow in slower water. This helps prevent competition for nest spots. It looks like dace are pretty good at sharing.

The redside shiner

is another small member of the minnow family. They are usually less than five inches long and found statewide. Redside shiners live in a many aquatic habitats including ponds as well as streams and rivers that are not too fast.

This microfish eats a variety of food. When they are young, plankton is their favorite food. As they get older, they begin to eat aquatic and terrestrial insects, worms, and snails. Like other microfishes, they are an important prey for larger fish like rainbow trout, cutthroat trout, northern pikeminnow and others. Diving ducks, herons, gulls, and mink also enjoy a meal of redside shiner. This species often moves in schools with other minnow species. If a school of these microfish is startled, they often hide in aquatic plants, especially in shallow water.

Redside shiners are known for their beautiful colors during the breeding season. From May – July, male shiners sport bright red and yellow stripes on their sides. These flashy colors help them attract females. The eggs are laid over gravel, sand or in aquatic plants. Like the adults, the eggs are also eaten by other fishes, but enough escape notice by predators. These eggs hatch, creating a new generation of redside shiners.

Sculpin

are a fascinating group of fishes found in Idaho. As a group, sculpins can be found in freshwater and saltwater all over the world. About 1500 species can be found, but only 60 of them live in freshwater. Here in Idaho, ten small species of sculpin live in our cold-water streams and rivers.

Sculpin are really cool! First off, they look rather odd. They have large, flattened heads. Their big eyes are close to the top of their head. The pectoral fins are large and shaped like fans. These fins help sculpins move across and hold on to rocks on the bottom of a stream. Two dorsal fins are found on their back, and their body is shaped like a teardrop. This allows water to easily flow around the sculpin's wide head and past the fish's narrower body.

Sculpin are bottom dwellers. They live on or under rocks on the bottom of streams and rivers. Sculpin have an amazing adaptation to help them live on stream bottoms---they don't have a swim bladder. This is a gas-filled organ located in many fishes' body cavity under the spine. The amount of air in the swim bladder allows a fish to control how it floats in the water. Some fishes, like herring and sturgeon, must gulp air at the water's surface to inflate their swim bladder. These fishes usually live in shallower waters. Most fishes, however, use gases in their blood vessels to control the amount of gas in their swim bladder. Since sculpin lack swim bladders, they sink to the bottom, which is where they want to be.

What's so cool about living on the bottom? This is where their food lives. Sculpin eat benthic (ben-thik) macroinvertebrates. Benthic means the bottom of a water body. Many

aquatic insect larvae live here. They are called macroinvertebrates. Insects like caddisflies, stoneflies, mayflies, dragonflies, and others begin life in the water. These larvae make a perfect meal for a hungry sculpin. Sculpin also eat fish eggs and juvenile fishes, which are called fry.

Excellent camouflage is another adaptation sculpin have for living in benthic habitats. Sometimes the only way to see a sculpin is when it moves. Sculpin take staying out-of-sight even further by being nocturnal. The darkness makes them hard to be seen by their prey or possible predators. During the day, sculpin hide among rocks, submerged logs, and other shelter. In the spring, sculpin reproduce. The males establish a territory and make a nest under rocks or in a cavity. Then it's time to show off for the girls. Males swim back and forth and even make sounds to attract a female. If she thinks he's the guy for her, she lays her eggs in the nest and leaves. The male will stay near the nest, guarding the eggs until they hatch.

Sculpin are another of Idaho's indicator species. They are more sensitive to pollution than other fishes. In addition, sculpin don't like it when too much sediment covers the bottom of a stream. Sediment can be soil, sand, or even particles of decomposing plants and animals. Too much sediment can make life hard for all benthic animals. It can kill the insect larvae that sculpin and other fishes eat. Sediment can cover the rocks where sculpin hide and make their nests. It can even make it hard for aquatic animals to breathe because it clogs their gills. It's a big red flag if sculpin numbers decrease in a stream or river. This tells biologists that the water is becoming unhealthy for all the animals living in it.

Aquarium Fishes in Idaho Waters

Idaho Fish and Game staff can get some interesting calls. Finding strange fish species in a local pond, lake or even a river is one of them. Biologists and conservation officers have found goldfish, carp, Oscars, zebra danio, tilapia, loach, and other tropical freshwater fishes in Idaho waters. They also find non-native turtles like red-eared sliders and common snapping turtles. Mississippi ghost shrimp have been found in the Boise River. What's going on?

Unfortunately, people sometimes get these animals as pets and then decide they don't want them anymore. While letting aquarium fish go in a pond or river might sound okay, it is not! Adding non-native fish to an established aquatic ecosystem can have many bad results. They can introduce new diseases, parasites, or fungus to the water. These can kill the native fishes. Non-native fishes and turtles also compete with native species for food and shelter. This can cause big problems for the existing food webs in that water body. In fact, non-native species can disrupt an entire ecosystem.

Because introducing non-native fishes to Idaho waters can cause so many problems, it is illegal. People found doing this can get in big trouble, including paying large fines. Keeping Idaho waters free of animals that don't belong makes sure that Idaho's native species thrive. If you think you want to keep tropical fish in an aquarium, make sure to do your research before you set up your tank. This will help you enjoy taking care of your fish for their lifetime.

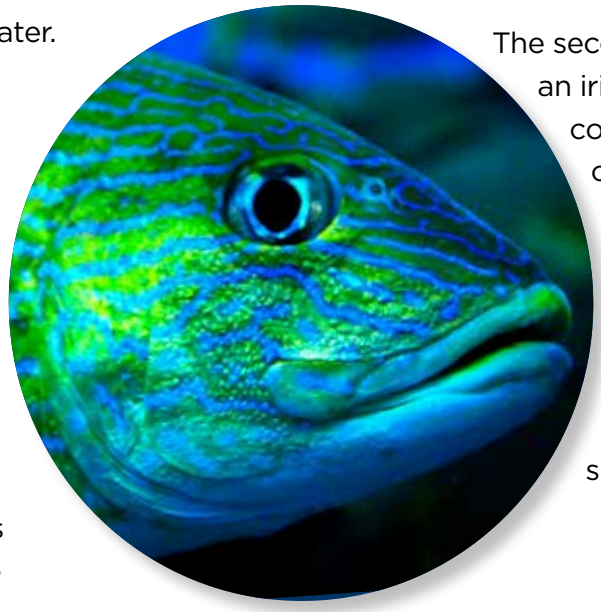
Turtle Photo: CC-BY Khoi Tranduc at Flickr.com
Goldfish Photo: CC-BY Brianne at Flickr | Zebra Fish Photo: Rumpleteaser at Flickr.com
Illustration: CC-BY Nancy Jasper Idaho Fish and Game

A Rainbow of Colors

Fish are some of the most colorful animals in the world. Coral reefs are known for their colorful tropical fishes. Many freshwater fish have beautiful colors during the breeding season. Colors in fish are also helpful for camouflage and defense. One kind of camouflage is called countershading. This means that the fish is darker colored on the top of its body and lighter on the underside. Countershading helps protect the fish. A predator flying or swimming overhead will have a harder time seeing the fish. Its dark back blends in with the water. Likewise, a predator swimming under a fish will not be able to see it very well. The fish's lighter underside blends in with the brighter light above the water.

Color helps fish defend themselves. When some fish are scared, they can quickly change color to frighten away danger. This kind of rapid change is controlled by the fish's nervous system. During the breeding season, fish color changes gradually. This is under the control of the fish's hormonal system. As the breeding season ends, the hormones in the fish's body fade. Their breeding colors fade, too. Colors on a fish can also change as the fish grows from a fry into an adult fish.

Colors in fish are found in two kinds of special cells. The first are the chromatophores (kro-MAT-te-for). They are found in a layer of skin called the dermis. Fish scales are also found in the dermis. Chromatophores each contain one color that is found in pigment granules called chromatosomes. They can have the colors black, red, yellow, blue or white. A color change happens when the color of a chromatosome concentrates in the center of a chromatophore or is spread throughout the cell.



The second kind of color cell is called an iridophore (irid-o-fore). These contain reflective crystals made of a chemical compound called guanine (gwa-neen). The crystals act like mirrors. They reflect colors of the outside environment where the fish lives. This is what gives many fish their shiny, silvery color.

Microfishing

When most people go fishing, they hope to catch the biggest fish. Some anglers, however, are doing the opposite. They are trying to catch microfish. This is called microfishing. It is based on an ancient Japanese form of fishing called tanago.

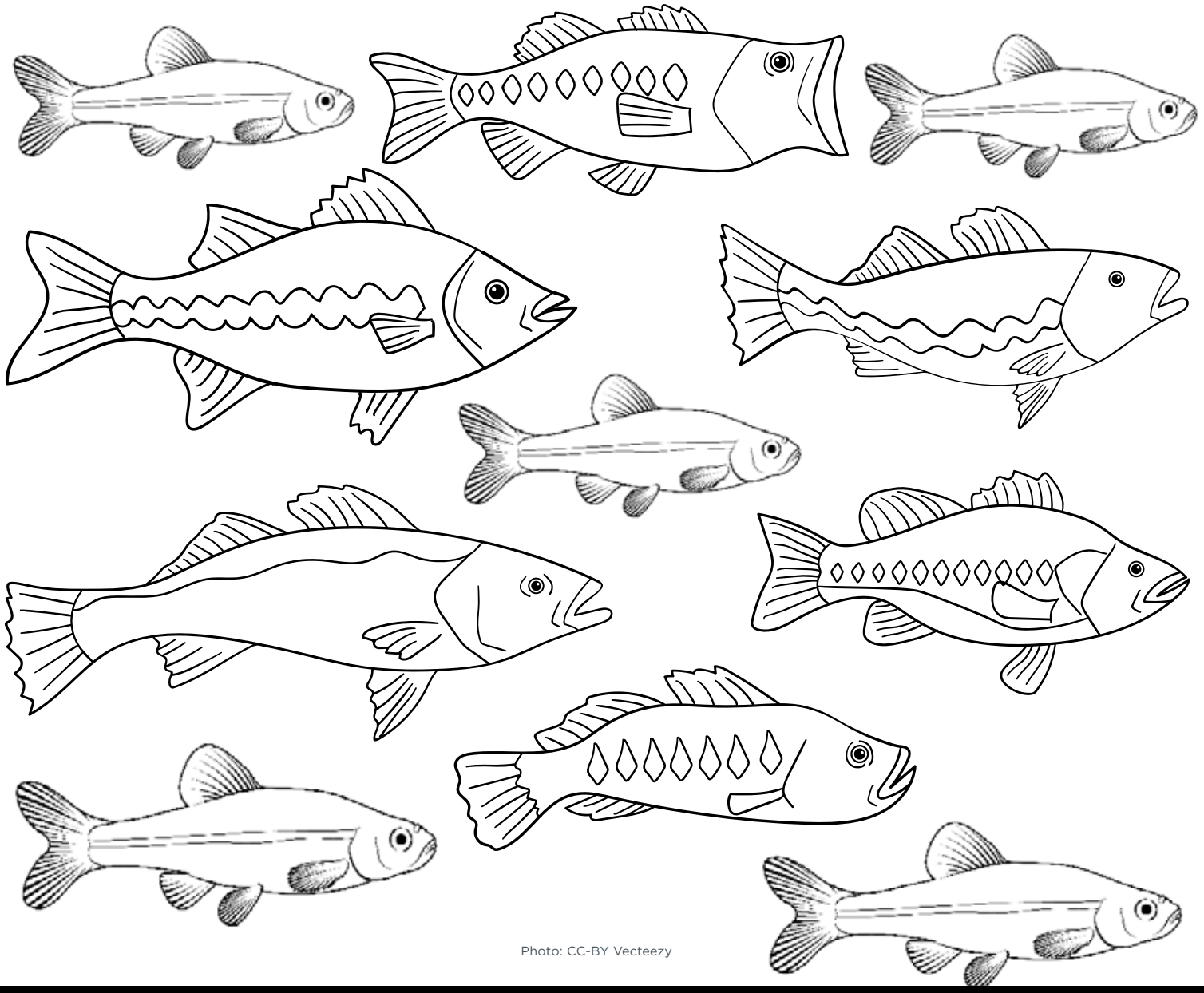
By using very small equipment, microfishermen fish for tiny fish. Instead of keeping their tiny catches, they take photos and carefully release the fish back into the water. Some people keep life lists of the species they catch, like bird watchers do for the birds they see. Many long-time fishermen have found great enjoyment from microfishing. They are amazed at the variety of microfish and their beauty. Some microfishermen say that they have developed a new appreciation for fish of all kinds and their habitats.

Microfishermen are also helping biologists learn more about microfish. These anglers use an app called iNaturalist. They download photos and information about the microfish they catch. Biologists can use this data to learn about microfishes and where they live. This gives them valuable information about the populations of microfish. It can also help them learn about the populations of larger fishes in an ecosystem.

If you would like to try microfishing, you will need to get some special gear. Many microfishing rods are no larger than a chopstick. They often do not have a reel. Very tiny barbless hooks or flies must be used. Size 28 or 30 are really small and work well. As with all fishing, make sure that you gently handle any fish you catch. Do not handle them for long and make sure your hands are wet. To keep track of your catch, take a few photos before gently releasing the fish back into the water. Also be careful as you move around in the water, so you cause as little disturbance as possible. Remember, if you are 14 years old or older, you will need to have a fishing license.

Microfishing is a new take on a much-loved pastime. You might just find yourself hooked on these beautiful tiny fishes!

Give the fish some color!



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WE WOULD LIKE TO HEAR FROM YOU!

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