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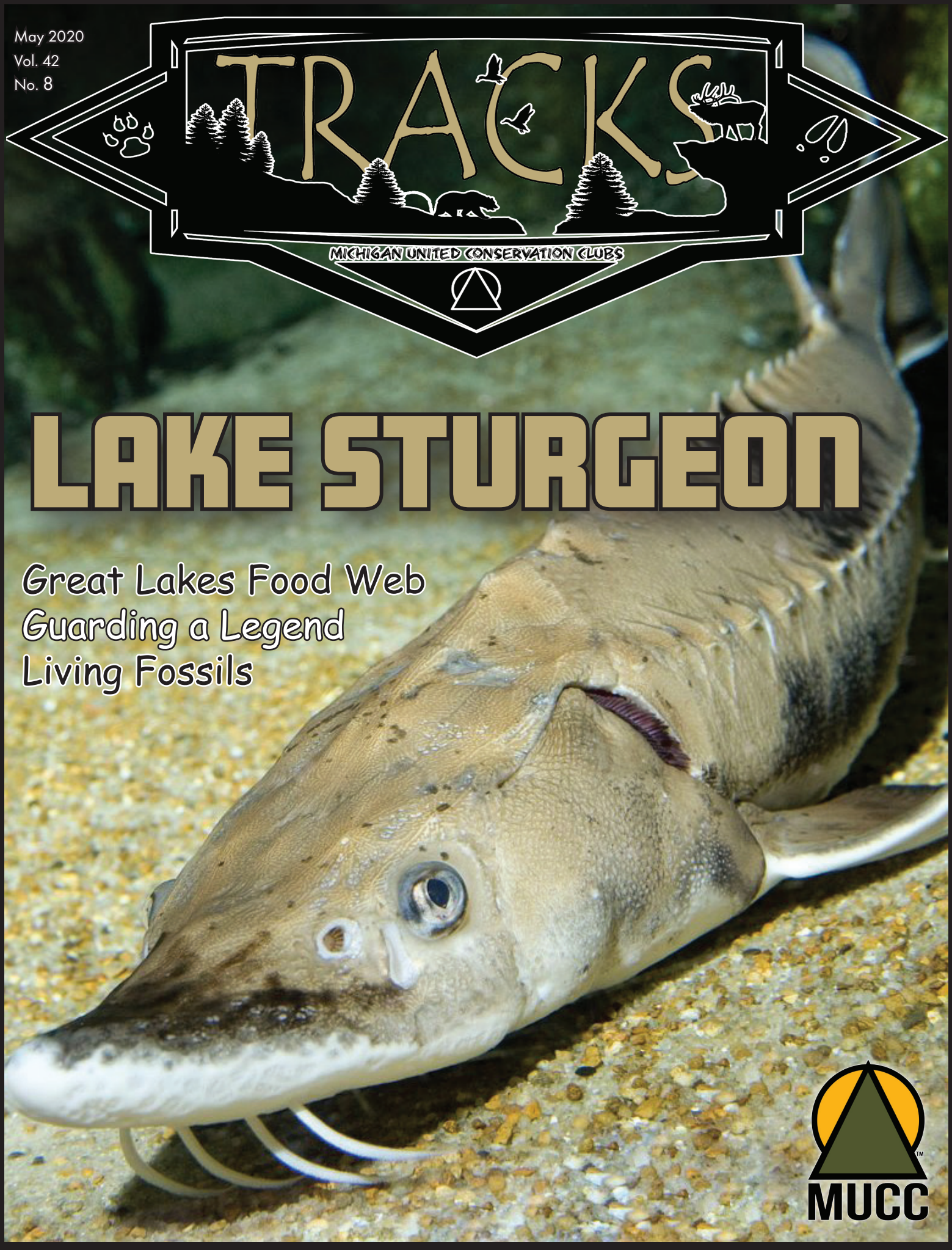
No. 8

TRACKS

MICHIGAN UNITED CONSERVATION CLUBS

LAKE STURGEON

Great Lakes Food Web
Guarding a Legend
Living Fossils



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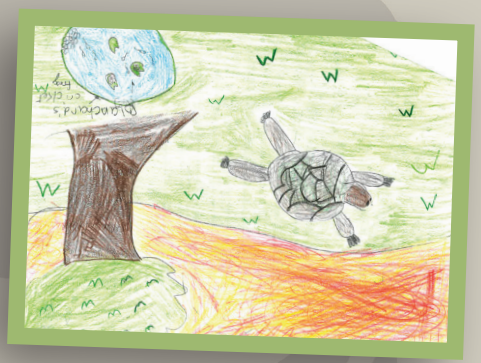
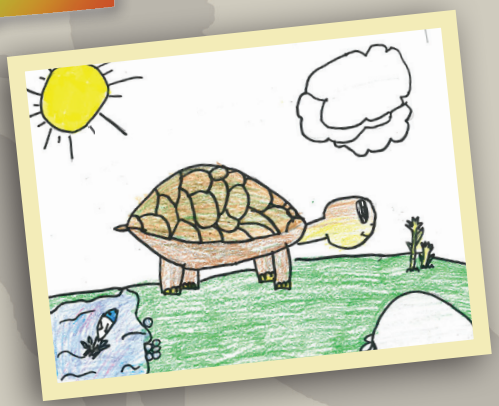


Dear TRACKS,

I did not know that leatherbacks weigh up to 1,800 pounds. I did know that turtles do not have teeth. I do not like when Blanding's turtles die it is very sad. I never knew that chelonian is a Greek word for tortoise.

Your friend,
Destiny W.
Ortonville, MN



Dear TRACKS,

I read your TRACKS about the Blanding's turtle. It was amazing; I liked how its shell is made up of 50-60 bones. I learned that because I read your TRACKS facts. I think everyone should read it because they are fascinating. Also turtles do not have teeth. They use their beak to tear food.

Sincerely,
Jhylie.
Newaygo, MI

Dear TRACKS,

Munger science siblings, Darius & Summer, found a cocoon outside in the late fall. They brought it indoors for protection and left it in an open pickle jar, stored in Darius' bedroom. In early January, a beautiful giant silk moth emerged. It escaped and was flying all over Darius' room Carefully the brothers caught it and transported it to their science teachers classroom The students have kept it alive by feeding it sugar water, mashed fruit and available flowers. Over 640 science students have enjoyed learning about this moth.

Sincerely,
Ellen H. Munger Elementary school

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Lake Sturgeon

The Lake Sturgeon or Acipenser fulvescens, is the largest freshwater fish that is native to the Great Lakes. It inhabits the large river and lake systems of the Mississippi River, Hudson Bay, and the Great Lakes basin. People enjoy eating fillets, smoked fish and caviar (the fish's eggs) from all sturgeon species.

The sturgeon has no scales but it is covered with five rows of bonelike plates (called Scutes) on its back sides and stomach. The rest of its body is made up of cartilage just like sharks and rays.

Lake sturgeons are light gray, dark gray or olive brown in color with a white belly. The young are tan or buff colored with blotches. They are usually three to five feet long and average 50-80 pounds. In some instances sturgeon can grow to be seven feet long or more.

Their bodies are thick and torpedo shaped with an upturned, shark like tail. They have a long, pointed snout with four "whiskers" in front of their mouths and their mouth is on the underside of their head.

Males typically live for 55 years. Females can live from 80-150 years. Females may not reproduce until they are 25 years old. Males may take up to 22 years.

Female lake sturgeons spawn once every four to nine years. Males spawn every, one to seven years. Due to this large range in spawning less than one quarter of adult lake sturgeon will spawn during any given year.

Lake Sturgeons have been greatly impacted by humans. From 1879-1900 they were a target by commercial fisheries. During this time, humans harvested over four million pounds of lake sturgeon from the Great Lakes.

Commercial overfishing, habitat loss, construction of dams and pollution nearly wiped them out. Within 19 of the 20 states of their traditional home range they are listed as either threatened or endangered on the Endangered Species List.

STURGEON HAVE A LONG, POINTED SNOUT WITH FOUR "WHISKERS" IN FRONT OF THEIR MOUTHS.

Fish Planting

SOMETIMES, SPECIES CAN NOT NATURALLY REPRODUCE AT A RATE TO SUSTAIN ITS POPULATION. OFTENTIMES, THE MICHIGAN DNR PLANTS THOSE SPECIES TO AID IN POPULATION NUMBERS

Every spring people plant flowers in their garden. They hope they will grow and blossom in the summer to make a beautiful garden. In a way, fisheries biologists do the same thing with fish. Small fish that are called fry are raised in a fish hatchery. They are raised to be fingerling size. Then these fish are released or planted, in lakes and streams where they are needed. This process is called fish stocking.

However, it is not enough to just plant fish in streams and lakes. Fisheries biologists must watch and monitor the fish to see how they are developing. For instance, let us say a lake was planted with 1,500 yearling rainbow trout. Biologists conducted a trap net survey later in the month to evaluate fish survival. Only five trout were caught in the net. However, there were several northern pike found in the lake. These fish are predators of rainbow trout and could explain why biologists did not find many trout in their survey. From the survey, biologists might decide not to plant any more rainbow trout because of the predators in the lake.

Why does the DNR plant fish? People like to fish for certain game species. Sometimes there is not enough natural reproduction in a lake to sustain a fish population. If people are taking fish out of a lake faster than fish can reproduce, stocking might be necessary. Biologists hope all of the fish they plant will grow to a large and healthy size. Like a gardener with vegetables, biologists want their planted fish to grow.

In Michigan, several groups work together to raise sturgeon to plant around the state. The Little River Band of Ottawa Indians raise sturgeon to plant in the Manistee and Muskegon rivers. Michigan State and the DNR raise sturgeon and plant them in lakes and rivers around the state. There are even classrooms of science students who have a sturgeon tank. Each class receives one fish that they raise for a year as a hatchling and release in streams near their school.

TRACKS FACT!

Gelatin from the lake sturgeon's swim bladder is called isinglass. In the past people used it to make jellies, glues, and windows for carriages and early cars.

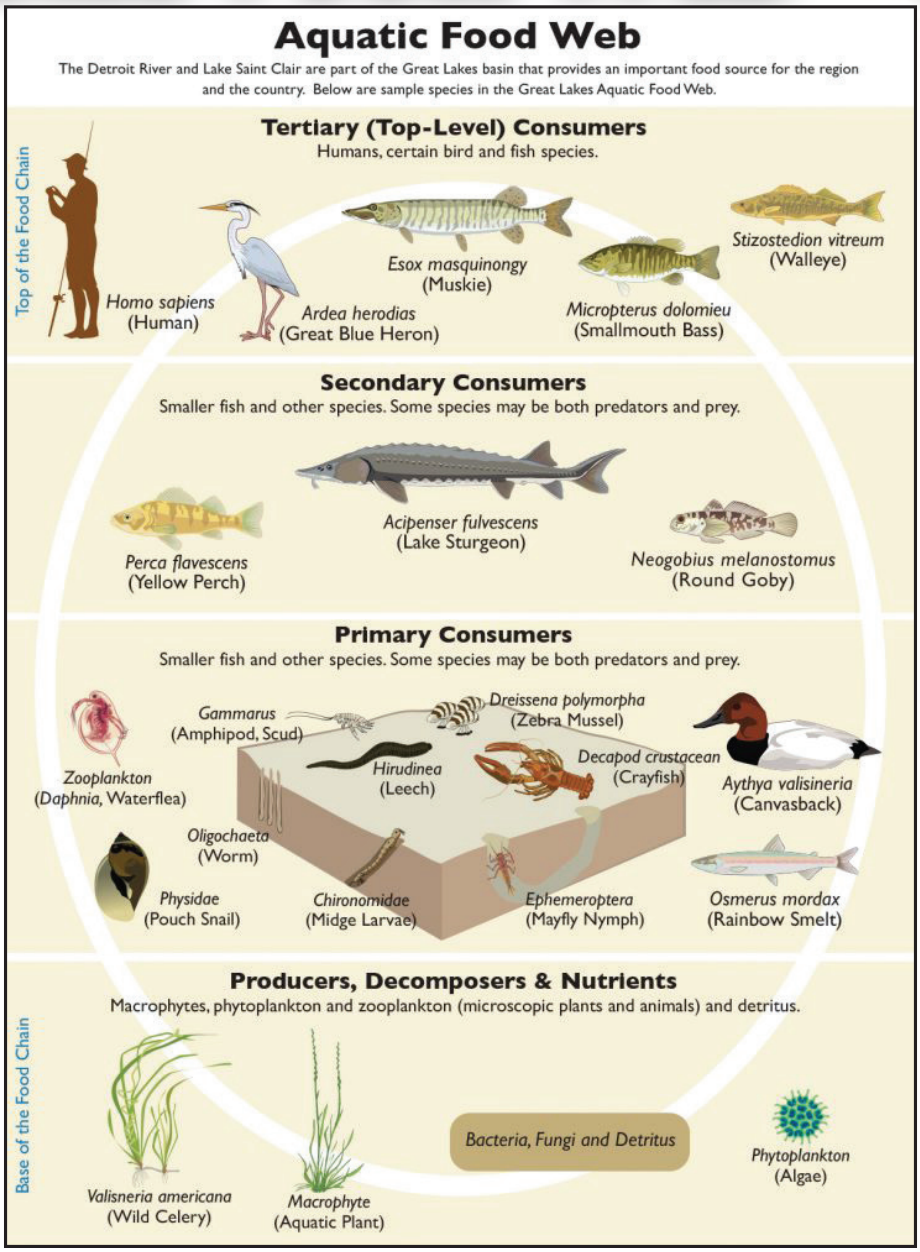
Great Lakes Food Web

The Great Lakes contain one-fifth of the world's freshwater. The lakes contain the largest supply of fresh surface water on the planet. The Great Lakes cover a total area of 94,000 square miles. There are 179 species of fish living in the Great Lakes basin right now.

All life in the Great Lakes and their surroundings make up an ecosystem. In an ecosystem, living and non-living parts of the environment interact. These interactions make up the different habitats for the living organisms. For an ecosystem to provide good habitat there must be food, water, shelter and space.

Like all ecosystems, the Great Lakes have many different food chains that are occurring in each habitat area. At the beginning of the food chain, many kinds of algae serve as producers. Zooplankton and other microscopic floating animals are first-level consumers. They feed on the producers.

Animals like snails, leeches and insect larvae serve as base level food for small fishes. We call these small fishes forage fishes. The forage fishes are second-level consumers and eat smaller consumers. Forge fishes include alewife, smelt and sculpins.



The third level consumers are larger animals that feed on small fish. These include fish like salmon, lake trout, walleye and bass. They also include birds, humans and other mammals such as otters and bears.

Other animals work to help keep energy cycling through the food web. Bacteria, and macroinvertebrates (aquatic insects) and crayfish feed on dead organic matter. They recycle nutrients for the producers and they may become food for many consumers.

The Great Lakes ecosystem supports many different kinds of life. Can you guess where the sturgeon fits in the food web?

GRAPHIC COURTESY OF SEAGRANT MICHIGAN

Fish Shape

A fish's shape helps it find food and shelter. The torpedo shape of trout, salmon and tuna helps them move fast to catch prey. The vertical disk shape of the sunfish helps them feed above or below the water. It also helps them change direction quickly while moving around weeds and logs in shallow water.

The hump-backed shape of the sockeye salmon and creek chub helps them stay stable in fast-moving water. The flat bellies of catfish and suckers help them feed on the bottom of the riverbed or lake.

The lake sturgeon also have flat bellies to help them feed along the bottom. Sturgeon also have four barbels or whiskers in the front of their mouth. They use the barbels to find food like crayfish, clams, small fish, insect larvae, snails, algae and plant matter. As soon as the barbels pass over food, their mouth drops down and sucks it in like a vacuum. The shape of a fish's mouth also helps them eat. Sturgeon's have an elongated upper jaw. This is helpful because sturgeons feed on prey that is beneath them.

Largemouth and smallmouth bass have very large jaws. This helps them surround their prey and capture them. Suckers and carp have sucker shaped mouths. This helps them suck very small plants and animals from river and lake bottoms.

A STURGEON'S MOUTH ACTS LIKE A VACUUM. WHEN A STURGEON PASSES OVER FOOD, ITS BARBELS HELP DETECT THE FOOD AND THE MOUTH SUCKS IT UP.

TRACKS FACT!
Lake sturgeon have taste buds on the outside of their mouth.

Muskellunge and pike have jaws shaped like a duckbill. This helps them grasp their prey.

A fish's shape helps it adapt to its surroundings.

TRACKS

MICHIGAN UNITED CONSERVATION CLUBS

LAKE STURGEON

LIVING FOSSILS

Fossil records help scientists understand natural selection. Natural selection is a theory. Natural selection occurs when nature "chooses" the animals that are the fittest to survive. This happens because all animals are different.

THIS FOSSIL IS A WHITE STURGEON THAT WAS FOUND IN LIAONING, CHINA AND HAD AGED MILLIONS OF YEARS BEFORE BEING DISCOVERED.

All living things have genes. Genes are the recipe for how every living thing appears and acts. All plants and animals inherit their genes from their parents. Every offspring gets a copy of their parent's genes. This can cause mutations and mutations cause variation and differences.

When we get our genes from our parents, they are shuffled or recombined. When this happens, we also get variation in our genes. This is why we do not look exactly like our parents. Think of your genes as a recipe for a cake. If someone changed, the letters in the recipe's words (like mutation) or shuffled the words around then your cake would taste funny. Variation in genes can cause new species to develop just as changing your recipe would make a new or different cake.

Sturgeon have lived for a long time. Most scientists think the first sturgeons lived in the Upper Cretaceous period. This is about 136 million years ago. Sharks are an even older species. Sharks lived long before the dinosaurs, about 400 million years ago. Those original shark species have gone extinct. Modern-day sharks only date back to the Jurassic period. Sharks from that period have evolved into 368 different species.

There are only 25 species of sturgeon. Most sturgeons are about the same size and shape, but sharks range from the size of a person's hand to the size of a bus. The first sturgeons did not have the bony plates and sucking mouth they do today. Sturgeons survived the dinosaurs that became extinct 65 million years ago. Sturgeons today still look like fossils we find from 54-40 million years ago.

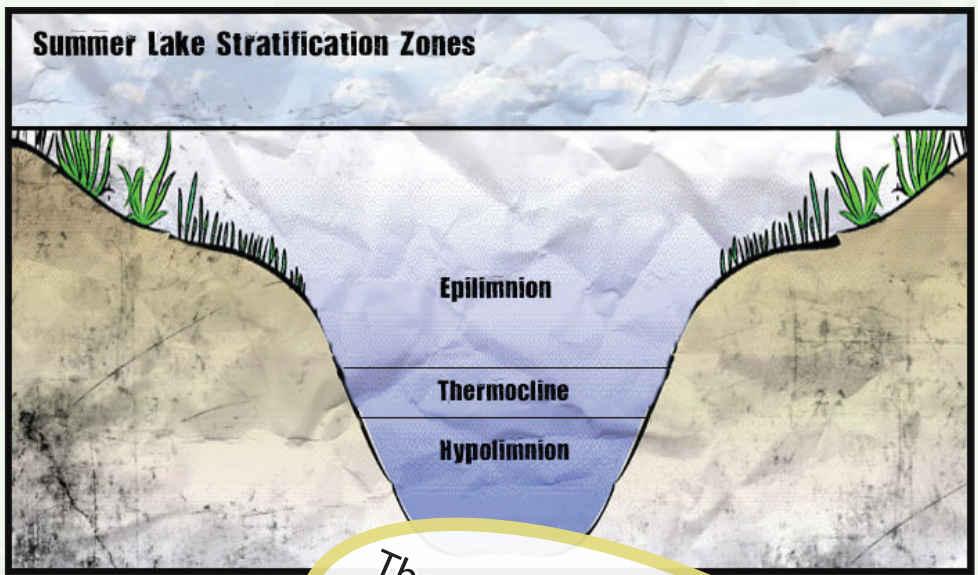
Natural selection did not change the sturgeon much over time. They are truly living fossils.

TRACKS FACT!
Lake sturgeon can lay 4,000 to 7,000 eggs per pound of body weight.

WATER ZONES

Water in the Great Lakes and large inland lakes changes a lot throughout the year. Let us look at a deep lake, like Mullett Lake in Cheboygan County, Michigan. We are taking a glance at the lake water during the summer. We can divide the water from top to bottom into three layers or zones.

The summer sun warms the upper layer of water to between 75-80 degrees. This forms a warm water (epilimnion) zone. Deeper water remains colder, at about 45 degrees. This colder water is heavier, sinking to form a bottom layer called a cold-water (hypolimnion) zone. Sandwiched in between these two layers is the thermocline. The thermocline is a cool water zone where water temperature changes quickly. This zone prevents mixing or heat exchange between the upper warm zone and the deeper cold-water zone.



Some fish, such as bass or sunfish prefer warmer water areas. Other fish like trout and salmon prefer colder water areas. More sunlight and runoff reaches the top two zones. Therefore, many plants grow here. In deeper offshore areas, you might find different types of algae. However, in the shallow, nearshore area where sunlight reaches the bottom you might find large rooted plants.

The algae and rooted plants are part of separate food chains. The deep offshore area and the shallow nearshore area are both water zones as well. Fish are adapted to live in specific water zones and anglers use their knowledge of the water zones to find and catch fish.

TRACKS FACT!

The record for largest sturgeon caught in the state of Michigan is 193 pounds and was 87 inches long. It was caught in Mullet Lake.

Fisheries Technician

Fisheries technicians study fish and their environment and can work with both wild populations and hatchery-raised stock. Working with a variety of fish species and habitats, fisheries technicians are often responsible for sampling and gathering data and supporting research and fisheries management. They play a key role in the conservation and protection of fisheries resources.

Duties change from job to job, but the following list includes typical job duties a fisheries technician may do while working:

- Assist in the breeding and rearing of fish species in hatcheries, including taking inventories of fish eggs, and cleaning and maintaining hatchery equipment.
- Collect data from various fish species, for example, length, weight, sex and age.
- Collect and analyze stomach contents for diet and nutrition studies and tissues for contaminants.
- Diagnose and administer appropriate treatments for sick fish, including identifying common parasites.
- Select fish suitable for release to specific lakes and rivers.
- Survey lakes, rivers, ponds and marshes to identify fish species, insects and plants using a variety of sampling techniques and equipment.
- Monitor fish populations using a variety of equipment, for example, nets and electrofishers.
- Operate and maintain equipment such as boats, nets and trailers.
- Maintain records of production, breeding and treatment programs.

DNR BIOLOGISTS AND TECHNICIANS RELEASE A STURGEON THEY CAUGHT FOR RESEARCH PURPOSES

Fisheries technicians work in a variety of locations, including, in the office, in the field and some positions even work in a laboratory. State and local governments employ fisheries techs. They may work doing research at universities and colleges. There are also fisheries technician jobs available for private companies that raise and supply fish.

In most cases, the minimum education requirement to work as a fisheries technician is a college degree. The following programs are highly recommended for a fisheries job, fisheries and wildlife, aquatic ecology, ichthyology (the study of fish). Certification is not mandatory in order to work as a fisheries technician.

Adapted from https://www.eco.ca/career-profiles/fisheries-technician/

GUARDING A LEGEND

Each spring, adult lake sturgeon, are at-risk to poaching as they briefly leave Black Lake in Cheboygan County for spawning sites upstream in the Black River.

Hundreds of volunteers join forces to stand guard along the Black River during the spawning season, from mid-April through early June. They work together to report any suspicious activity and deter people from poaching these fish.

BOY SCOUTS PARTICIPATE IN THE STURGEON GUARDING PROGRAM ON THE BLACK RIVER.

For over 20 years, the annual Sturgeon Guarding Program has proven that people watching over the river have virtually eliminated poaching. These guards have helped to ensure the protection and reproductive success of the fish. To be a volunteer is a unique and rewarding experience.

When spawning begins, sturgeon guards are assigned in shifts to sites along the river. The volunteers stand watch and, if suspicious activity occurs, use cell phones provided by Sturgeon for Tomorrow to contact DNR conservation officers.

"The experience of watching researchers capture, tag and release these amazing fish is, in itself, worth the effort of becoming involved," said Brenda Archambo, coordinator of the Sturgeon Recovery effort in the Black River watershed.

Lake sturgeon are an iconic, ancient fish species. Many opportunities over the approximately six-week-long spawning season are available for those who wish to help. Coordinators will be on-site at the river to assist and answer questions. In addition to guarding the sturgeon, volunteers can also play a key role by recording the number and activity of fish they see. This has become a popular activity for families, scouting and church groups, as well as students interested in natural resource management.

Lake sturgeon rehabilitation in the Cheboygan River watershed is a cooperative effort involving the Black Lake Chapter of Sturgeon for Tomorrow, the Michigan Department of Natural Resources, Michigan State University and Tower-Kleber Limited Partnership.

Information taken from https://www.sturgeonfortomorrow.org/guarding-program.php

Pour a Pond

Sturgeon often find themselves eating aquatic insects. Having your students catch and observe some "water bugs" is a great way to learn about the food web and see what may be living in a water body near your classroom.

Objective: Participants will be able to describe aquatic insects and become familiar with organisms in ponds and lakes.

Materials:

- 2 five gallon buckets filled with pond water
- Fine mesh collecting nets
- One hula hoop for every 5 participants
- Large white garbage bag, table cloth or shower curtain for each hula-hoop
- Plastic spoons or tweezers
- Magnifying lens
- Field guides or printable aquatic insects ID sheets https://stroudcenter.org/macros/key/

Procedure:

Prior to this activity, you will need to apply for a scientific collector permit from the Michigan DNR. Once you receive the permit, go to a lake a stream or river and collect a bucket full of aquatic insects to bring into your classroom.

Lay out the hula-hoops with the white bag over them. The hula-hoop will provide a rim to keep water from spilling out.

Have the students pour some of the water onto the bag, this will carry some of the insects onto the sheet for observation by the students. Arrange your students so that each small group is around a hula-hoop that contains water and tiny organisms.

Provide each student with tweezers or a small spoon. This will allow them to sort and investigate the organisms that are in their pond water.

Encourage the students to use the identification charts to sort the bugs by species type. The identification charts can also be used to teach the students about taxonomy and how to use a key.

Have the students rotate between ponds every 10 minutes. This will allow the students to see the variety of organisms that can live in a water body.

At the end of the exercise, make a list of all of the organisms the students found. You can choose to discuss the natural history of each insect at the end of this activity.

This activity was adapted from Project FISH created by Mark Stephens, Michigan State University

-Wildlife Habitat-

Food:

Mollusks, crustaceans, shrimp, crayfish, snails, clams, mussels, insects, worms and fish eggs.

Water:

Found in freshwater.

Shelter:

Live near the bottom of lakes and rivers.

Space:

Large rivers and lake ecosystems of the Mississippi River, Hudson Bay, Pacific Northwest and Great Lakes regions.

LAUGHING TRACKS!

Q: Which fish can perform surgery?

A: A sturgeon!

Q: What did the fish say when he got out of jail?

A: I'm off the hook!

Q: Why don't fish play soccer?

A: They are afraid of the net!

Michigan United Conservation Clubs
P.O. Box 30235
Lansing, MI 48912

Quiz!

1. Can you describe what an adult sturgeon looks like?

2. How long do female sturgeons typically live?

3. Which organizations are working towards ensuring we have sturgeon for future generations?

4. What did people in the past use isinglass to make?

5. How many square miles do the Great Lakes cover?

6. Approximately how many eggs can a female lake sturgeon weighing 60 pounds lay?

7. How do the barbels near sturgeon and catfishes mouths help them feed?

8. What is the Michigan state record for largest lake sturgeon on record?

9. How many species of sturgeon are there around the world?

10. Name two tasks a fisheries technician may perform while going about their work day?