Fish On!

using art as a springboard into the fascinating world of fish

The Wildlife Forever®
State-Fish Art™ Project Lesson Plan

Open to Grades 4-12

THE ART OF CONSERVATION®

INTERDISCIPLINARY ~ MULTIMEDIA ENVIRONMENTAL EDUCATION

- Bringing aquatic conservation into classrooms
- Learn about fish species, their habitat and conservation needs
- Draw, paint, and sketch your way to free prizes, fishing gear, and national recognition!

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The Wildlife Forever® State-Fish Art™ Project

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"It takes the outdoors into the class room, teaches life skills and conservation … what's not to love about the State Fish Art Contest!"
~ Steve Pennaz, Executive Director, North American Fishing Club

Foreword:

The ART of Conservation®

by Douglas H. Grann

Wildlife Forever's State-Fish Art™ (SFA) Contest started out as a homework assignment and became an annual nationwide art competition teaching aquatic conservation through the arts. Back in 1998, Sal DiLeo and his young daughter, Katie, had a big idea, a state fish art idea. Sal sought out the advice of Bud Grant, Minnesota Viking Coach & NFL Hall of Famer and came to Wildlife Forever with their vision. The rest of the story is history.

Over the years sports and fishing legions like Bud Grant, Bill Dance, Steve Pennaz, Ron Schara and Babe Winkelman have served as National Spokesmen and ambassadors for the State-Fish Art® Contest.

The contest is open to all students in Grades 4 through 12. Three categories of winners, from each state, are invited to attend the annual State-Fish Art Expo. We have received thousands of entries from all 50 states plus art from Russia. The best part is always the children's artwork. It is absolutely amazing! Our staff and the panel of judges marvel at the creativity of these young artists.

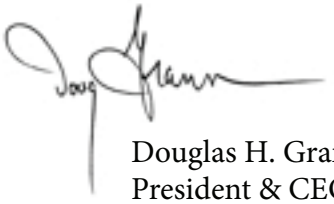
Throughout the many years of the SFA Contest & Expo we have come to know that the measure of success is more than in the number of students involved and the conservation lessons learned. We have seen communities rally to support winners by giving them airline tickets to attend the Expo. We have seen lives enriched and lives changed.

A few years ago, a grandmother from New Jersey called and told me her grandson was headed to college. Great, but somehow I knew there had to be more to the story. She said he had fallen into the "wrong crowd" and was in a failing pattern. Winning the State-Fish Art contest in his home state lifted his confidence and his self worth. Today he is pursuing a Graphic Art degree in college. Now, that is success!

At Wildlife Forever, we believe conservation education is the key that will ultimately determine the very future of our country's fish and wildlife heritage. When you start on your journey and enter the State-Fish Art contest you will put paint and color to paper. You will have decided to not do something else but to learn, study and create with your skills and imagination a state fish. In doing so, you will join the ranks of one of America's great movements. You will become a conservationist and a steward of our fish, lakes and streams.

Your efforts, talents and decisions may well lead you to the winner's circle. Remember the deadline for entry is March 31st. Join us in the Art of Conservation!

Good luck!



Douglas H. Grann
President & CEO

About

Wildlife Forever®

Wildlife Forever is America's leading multi-species nonprofit conservation organization. Working with state game and fish departments, federal agencies, and private conservation groups, our projects benefit habitat, fish and wildlife management, research, and conservation education nationwide.

Wildlife Forever has a long history of getting the job done. Thanks to our members and donors, America has . . .

- over 130,000 new trees planted
- 34,000,000 fish raised and stocked
- more than 1,000,000 kids involved in conservation education
- 9,000 waterfowl nesting structures placed
- 230 miles of improved and repaired streams
- and many hundreds of thousands of habitat acres protected or restored

Developing elementary and secondary school programs that foster knowledgeable, responsible and thoughtful stewardship, Wildlife Forever works to produce innovative, high-quality, inexpensive materials for use in traditional and non-traditional settings alike.

The Wildlife Forever State-Fish Art™ Project is an exciting multimedia education program designed to increase awareness of and respect for aquatic resources using art as an extension tool into the fascinating world of fish.

In addition, *Sport Fish of North America,* in Wildlife Forever's handy *Critters Pocket Field Guide Series*, is a perfect compliment to the State-Fish Art Project. High quality photographs of fifty fish with in-depth details and fun facts provide a tool enjoyed by both young and old!

Wildlife Forever's educational *Threat Campaign* targets non-native invasive species that have recently entered our lakes, rivers, and streams forcing out native fish and wildlife thereby greatly altering our natural resources. Visit Invasive Species Central to learn more.

The good news is you can help stop their spread by doing a few simple things each time you go fishing or boating. Additional resources are now available in this lesson plan to help students learn about these unwanted visitors and their part in halting the invasion.

" We strongly believe education will ultimately determine the future of our wildlife heritage. As the driving force behind our most successful conservation projects, our education mission is to teach future generations stewardship of America's fish, wildlife and habitats."

~Douglas H. Grann, President & CEO, Wildlife Forever

About the

Wildlife Forever® State-Fish Art™ Project

The Wildlife Forever State-Fish Art Project is an exciting, multimedia education program designed to increase awareness of and respect for aquatic resources. Interdisciplinary in nature, the program uses art as a springboard into the fascinating world of fish. The project has two primary components:

THE LESSON PLAN: Fish On!

Fish On! has been written for educators teaching grades four through twelve. The lesson plan includes extensive background information, procedure and assessment options, extension activities, student worksheets, quiz questions, sample compositions, and a thorough glossary. It has been designed for use as a stand-alone unit or as a supplement to the Wildlife Forever CD-ROM Curriculum for Elementary Grades.

A unique species identification section includes a profile of each state-fish, containing a beautifully illustrated physical description, reproductive and feeding behaviors, and habitat requirements.

> ***"Thank you for providing such a wonderful opportunity for my science and art students to learn about their state fish!"***
> ~ Kathleen Chapman, Toltec Elementary School, Eloy, Arizona

THE STATE-FISH ART CONTEST

The Wildlife Forever State-Fish Art Project culminates in a national art contest for children who have actively participated in the **Fish On!** lesson. Students use their newly acquired knowledge to create a learning portfolio, which includes an original state-fish art illustration and a related composition/essay about their chosen state-fish. The deadline for entry is always MARCH 31st.

> ***"Several big success stories involve the arts with conservation. As a past judge of the State-Fish Art Contest, the students learn about fish and fishing and the best part is the art is amazing!"***
> ~Joseph Hautman, Wildlife Artist
> Federal Duck Stamp winner 1992, 2002, 2008

On Earth Day, a committee composed of wildlife artists, outdoor writers, fisheries specialists, and national celebrities, selects three winners from each state to be honored at the annual State-Fish Art Expo each summer.

The State-Fish Art Expo is hosted annually in states that organize and promote the competition at the state level. Current participating states include Arkansas, Minnesota, and Texas. Please follow the links above to these individual states' contest information.

If you are interested in organizing and promoting the Wildlife Forever State-Fish Art Contest in your state, please let us know and we'll get you started! Contact State-Fish Art Contest

Fish On!

Subjects
- Language Arts
- Art

Skills
- Identify
- Research
- Write
- Illustrate

Time
- 2 to 4 class periods

Objectives

Students will:

1) Label the parts of a fish and describe their function.
2) Outline a simple aquatic food chain.
3) Explain several characteristics associated with fish adaptation including gills, fins, and scales.
4) Describe specific examples of fish behavior including feeding and spawning.
5) Identify their state-fish, its physical appearance, and its habitat requirements.

Vocabulary

Anadromous	Lateral line	Prey
Camouflage	Milt	Redd
Carnivore	Omnivore	Salt water
Cold-blooded	Plankton	Vertebrate
Fresh water	Predatory	

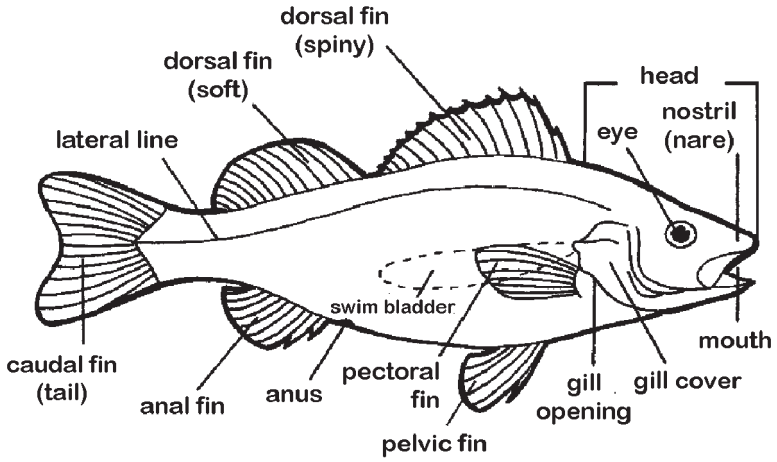
Background

How many different species of fish are there? How are fish adapted to life under water? How do fish reproduce? How can you determine the age of a fish? What do fish eat? What kind of defense mechanisms do fish have? What is a group of fish called?

(Note: the answers to these questions are found throughout the text. However, for quick reference turn to the procedure section.)

There are over 25,000 different species of fish in the world and roughly 2,000 in North America. In fact, fish represent more

Apache trout
Illustration by Joseph Tomelleri



than half of all **vertebrate** animals. There are flat fish, skinny fish, and fish that crawl on land. There are flying fish, electric fish, and fish that live in schools.

Fish vary greatly in size and color. Some are tiny, measuring only two inches in length like the Naked Goby. Others are giants. The Whale Shark measures some 50 feet. That's longer than a school bus! Some fish are drab and mottled. Some are patterned with stripes, bars, and spots. While others are aglow with brilliant color: red, yellow, orange, green, pink, silver, and blue. The tremendous diversity among fish is a result of 400 million years of evolution and unique environmental conditions associated with life in the water.

Adapting to life in the water: Gills, fins, scales

The oldest group of vertebrates, fish can be found wherever there's water. Three quarters of the Earth's surface is covered by water, including **salt water** (oceans, tidal pools, and coral reefs) and **fresh water** (lakes, cold mountain streams, and slow-moving rivers). Fish are specially adapted to life in the water, they have permanent gills, and most have fins and scales.

Gills

Gills are thin, feathery-like membranes located inside slit-shaped openings behind the head. Fish get oxygen from the water by passing it through their mouths and over their gills. Oxygen is absorbed through the gill membranes and carbon dioxide is removed.

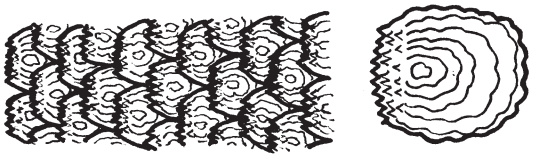
Fins

Fins aid in maneuverability. Each fin has a particular function.

- The pectoral fin is found at the side behind the gills. It helps with diving, swimming to the surface, and remaining stationary.
- The dorsal fin is vertical from the back. It helps keep the fish from rolling.
- The pelvic fin is a stabilizer. It helps with balance.
- The caudal fin or tail helps to propel and steer. A forked tail allows for increased speed, whereas a broad tail allows for increased maneuverability.
- The anal fin is located near the rear of the belly. It helps with balance.

Placoid scale (shark)

Ganoid scale (gar)



Ctenoid scale (perch)

Cycloid scale (salmon)

Scales

Most fish have a flexible armor of protective scales covering their bodies. There are four kinds of scales: placoid, ganoid, ctenoid, and cycloid. Placoid are tooth-like. Ganoid are diamond shaped. Ctenoid are comb-like, and cycloid have a rounded appearance. Ctenoid and cycloid are the two most common scale types.

Scales vary in size from one species to another and may be as large as a silver dollar. Scales do not increase in number but grow as an animal grows. Scales grow faster during the summer months when food is abundant. Each year, an "annual ring" is laid down within each scale. Counting the consecutive annual rings will provide an estimate of the age of the animal. The scales are coated with a slimy layer of mucous that has antiseptic properties, which protect the animal against disease and parasites.

Gas Bladder or Swim Bladder

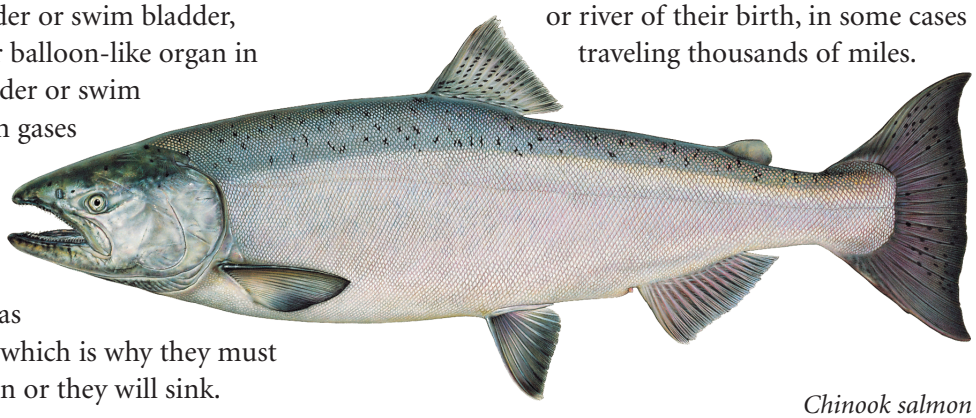
Most fish have a gas bladder or swim bladder, which is an airtight sac or balloon-like organ in the gut area. The gas bladder or swim bladder selectively takes in gases from the bloodstream to regulate floatation and buoyancy. Some fish, including the shark and tuna, do not have a gas bladder or swim bladder, which is why they must remain in constant motion or they will sink.

Sights, Smells, and Sounds

The underwater world is often murky or cloudy, which limits visibility to about 100 feet or less. Although fish have good peripheral vision due to the position of their eyes and many scientists believe that they can see color, they rely predominantly on their senses of smell and sound. In fact, most fish use smell to find food, locate a spawning site, and avoid danger. Nostrils, called "nares," are prominently located on the snout.

Many fish are carnivores and use smell to locate their prey. They feed on other fish, marine invertebrates such as squid, amphibians such as frogs, and zooplankton, which are tiny, microscopic animals.

Some fish use smell to locate a preferred spawning site. **Anadromous** species such as salmon begin their lives in fresh water but migrate to salt water where they live until they reach maturity. At spawning time, they use their sense of smell to guide them back to the freshwater stream or river of their birth, in some cases traveling thousands of miles.



Chinook salmon
Illustration by Joseph Tomelleri

Channel catfish
Illustration by Joseph Tomelleri

Fish also use smell to communicate, secreting chemical scents called "pheromones," which serve as a means of communication between members of the same species. For example, some species, such as tuna, live together in a large protective group called a "school." When a member of the school is attacked by a predator, it secretes a pheromone to warn the others of danger.

Fish have ear-like openings on either side of their head, which provide for excellent hearing. And some fish, such as catfish, have whisker-like appendages with taste buds called "barbels," which provide added sensory capability as they probe the bottom for food.

Lateral Line: "A Sixth Sense"

Fish have a unique system of sensory nerves located in the skin called the **lateral line**, which in many ways serves as their sense of touch. The lateral line extends from just behind the head along to the tail on either side of the fish. The lateral line detects the slightest movement of water, which helps a fish to avoid danger or to capture food in otherwise dark or cloudy water.

Camouflage: Protective Coloring

Most fish have some kind of protective coloring called **camouflage**. Camouflage is an adaptation that enables fish to disguise themselves or to blend-in with their surroundings. Camouflage can take many forms. It can be a color that allows an animal to blend in with its environment or an appearance that allows an animal's shape to mimic its environment. Muskellunge and northern pike are mottled and greenish in color, allowing them to blend in with their weedy environment. Sole are flatfish with coloration that resembles pebbles or sand allowing them to virtually mimic their environment. Further, most fish are patterned with bars, stripes, or spots, which provide additional camouflage by breaking up an otherwise distinctive silhouette.

Some fish can actually change color during the spawning season (breeding season) or as they age. Color can also vary according to water temperature, sex, and even location. Generally, brightly colored fish are found in the tropics, fish that live near the surface are bluish-green, and fish that live near the bottom are brownish.

Counter shading, also called "obliterative camouflage," is a very common type of protective coloring. Counter shading refers to fish that have darker-colored backs and lighter-colored undersides such as sharks, rays, billfish, trout, and cod. Counter shading provides a certain amount of protection and concealment from predators above such as bald eagles and osprey and predators below such as other fish and otters.

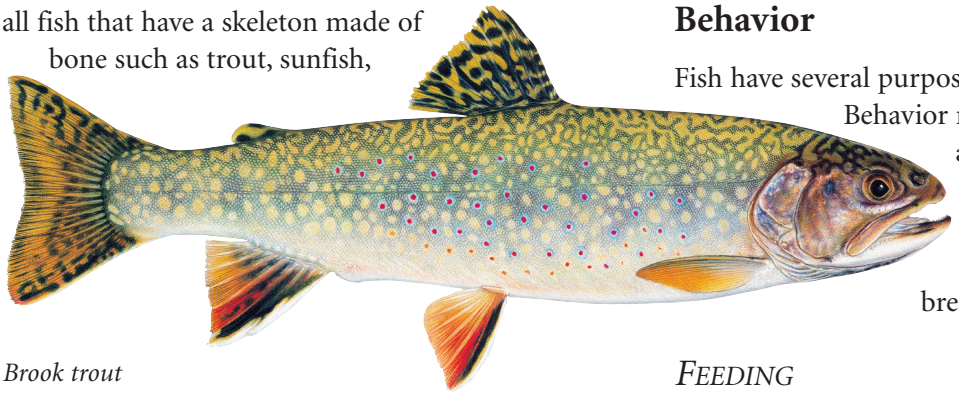
Cold-Blooded

Fish are cold-blooded or ectothermic animals, which means their body temperature depends on their environment. As such, water temperature greatly affects distribution. Most fish are found in temperate areas. Amphibians and reptiles are also cold-blooded animals. In contrast, warm-blooded or endothermic animals such as mammals and birds are able to maintain a constant body temperature even when the temperature around them changes.

Paddlefish
Illustration by Joseph Tomelleri

Types of fish

There are paddlefish, porcupine fish, sunfish, parrot fish, dogfish, goat fish, and even butterfly fish. Generally, fish are divided into two groups: those that have a skeleton made of cartilage *(Chondrichthyes)* and those that have a skeleton made of bone *(Osteichthyes)*. *Chondrichthyes* consist primarily of marine species and include sharks, skates, and rays. *Chondrichthyes* have a skeleton made of cartilage rather than bone, and their mouths and gill openings are on the underside of their bodies. *Osteichthyes* include all fish that have a skeleton made of bone such as trout, sunfish, perch, salmon, tuna, cod, walleye, bass, flounder, halibut, and sole. By far the most dominant group, *Osteichthyes* are characterized by two sets of paired fins, a set of vertical fins, and a swim bladder. Scientists recognize another group of fish called "*Agnatha*" to classify a few primitive species including the lamprey. *Agnatha* have poorly developed skeletons. They lack jawbones and paired fins.



Brook trout
Illustration by Joseph Tomelleri

The name game

Although fish have many distinguishing characteristics such as shape, size, and color, species identification can be tricky, especially since species identification can vary from region to region. For example, "largemouth bass," "bigmouth bass," "black bass," "green bass," and "bayou bass" are all names used to identify one species of fish, the *Micropterus salmoides*. As such, all fish have one scientific name, which is always italicized.

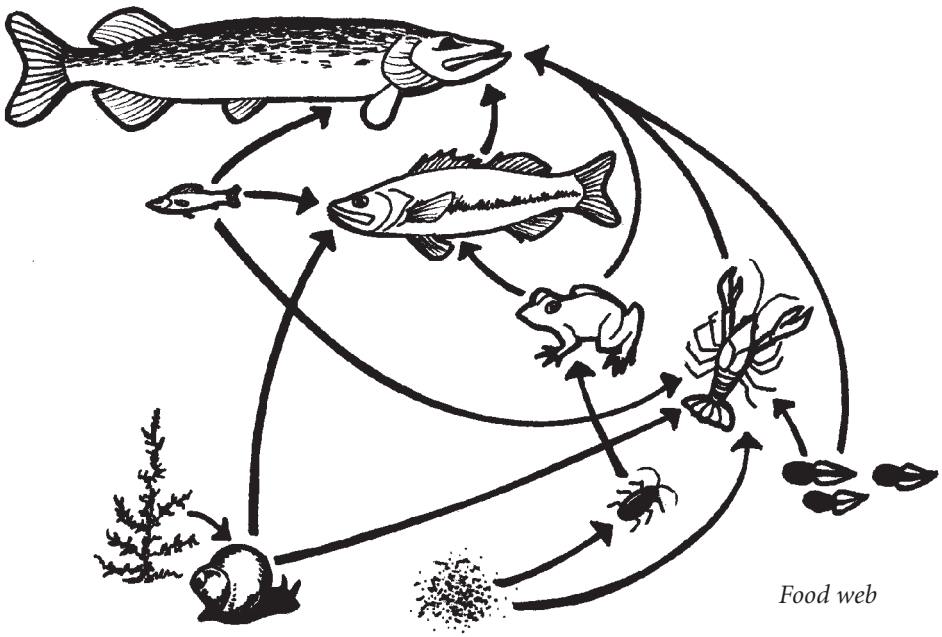
Behavior

Fish have several purposeful patterns of behavior. Behavior refers to the way in which an animal responds to its environment. Behavior takes many forms including feeding and breeding.

Feeding

Fish spend much of their time feeding. They are most active at dawn and dusk. Many fish are meat eaters, called **carnivores**. Others, called **omnivores**, eat both plants and animals.

Predatory fish such as trout feed on insects, crayfish, fish eggs, and small fish. Northern pike eat mostly fish, but also eat frogs, crayfish, mice, muskrats, and ducklings. Predators usually swallow their **prey** whole. Humuhumunukunukuapua'a feed on seaweed and insects, and bluegill feed on aquatic plants, insects, and small fish. Fish equipped with sieve-like gill rakers feed on



Food web

plankton, which is the generic term used for microscopic plants and animals.

All fish are members of a food chain, which is a group of plants and animals linked together as sources and consumers of food. Food chains linked together form a larger, more complex food web.

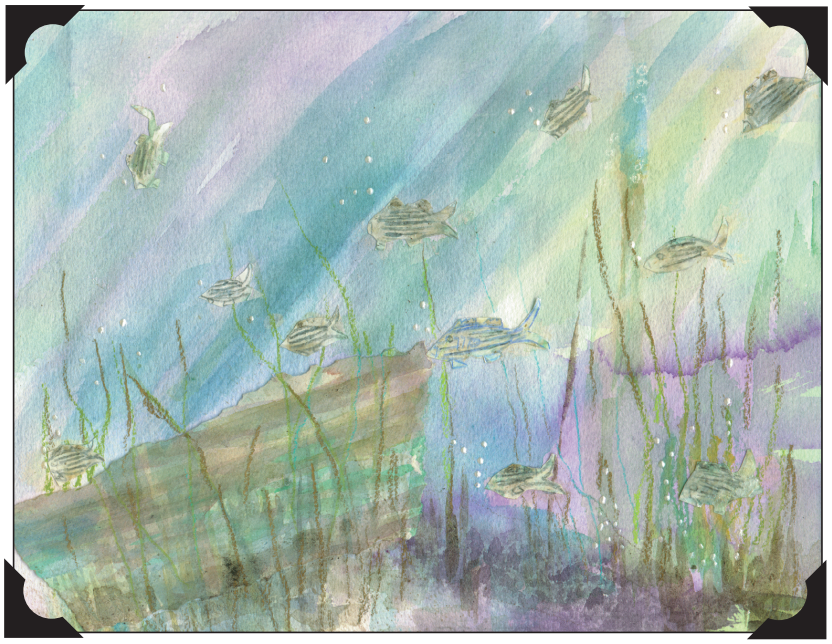
Fish distribution, health, and population size is largely due to the quality and quantity of available food. Increased variety in available food leads to increased diversification among species of fish in a given area.

Spawning

In most fish, fertilization is external. The female produces an amazing number of eggs that usually appear as a long, jelly-like strand or blob. Eggs vary in size depending on species from one-fifth of an inch to seven-eighths of an inch. Some eggs attach to rocks or plants, others free-float. Several species of fish, including the largemouth bass, construct a nest-like depression called a **redd** where the eggs are deposited. The male's **milt** later fertilizes the eggs. In most cases the fertilized eggs are left unprotected, and the majority do not survive as fry (young fish).

As previously mentioned, some species migrate to distant spawning grounds. Anadromous species including salmon begin their lives in fresh water but migrate to salt water where they live until they reach maturity. At spawning time, they use their sense of smell to guide them back to the freshwater stream or river of their birth, in some cases traveling thousands of miles. The Pacific salmon, Atlantic salmon, king salmon, and sockeye salmon die after spawning.

Species	Number of eggs	Hatching time
Largemouth Bass	2,000 to 7,000	8 to 10 days
Bluegill	12,000 to 15,000	2 to 5 days
Salmon	2,000 to 10,000	3 months



Striped Bass

The Striped Bass is South Carolina's state fish. The Striped Bass is silvery blue with seven horizontal black stripes. You mostly find the Striped Bass in fresh water like Lake Murray. The Striped Bass swims in schools of 20 fish to a school. The Striped Bass spawns in spring. The Striped Bass lays up to 25,000 eggs at each spawn. Only 50% of the fry lives. The average weight of the adult Striped Bass is 15 to 35 pounds.

Originally the Striped Bass was only found in the Santee Cooper Lakes. The South Carolina Wildlife and Marine Resources Department has stocked every public reservoir and lake with Striped Bass. In Lake Murray, the SCWMRD has made fish attractors out of red cedars and discarded Christmas trees. Most of the sports fishermen that have fished these spots have reported good fishing.

Striped Bass like to live in shallow water near vegetation. They prefer lakes better than fast moving rivers. Striped Bass are found in fast moving water and also found in deep holes or near the edge of the water.

Example from Grades 4–6
South Carolina winner

Procedure Options

1) Anticipatory setting questions or pre-test

Approximate time: 15 minutes

1) How many different species of fish are there?
2) How are fish adapted to life under water?
3) How do fish reproduce?
4) How can you determine the age of a fish?
5) What do fish eat?
6) What kind of defense mechanisms do fish have?
7) What is a group of fish called?

Answers

1. How many different species of fish are there?
There are approximately 25,000 different species of fish in the world and roughly 2,000 in North America.

2. How are fish adapted to life under water?
Fish are well adapted to life under water. They have gills, fins, scales, and a gas bladder.

3. How do fish reproduce?
In most fish, fertilization is external. The female deposits the eggs, and the male fertilizes them later with its milt.

4. How can you determine the age of a fish?
One way to determine the age of a fish is by counting the annual rings on its scales.

5. What do fish eat?
Different species of fish eat different things. Many fish are carnivorous, meaning that they eat meat including other fish and insects. Others eat plant material as well.

6. What kind of defense mechanisms do fish have?
Different species of fish have different defense mechanisms. Some live in large groups called schools. Some have protective coloring called camouflage, which allows them to blend in with their surroundings.

7. What is a group of fish called?
A group of fish is called a "school."

2) Composition

Approximate time: 2 to 3 class periods

Assign a composition or theme paper as part of ***The Wildlife Forever State-Fish Art Contest.*** Compositions should not to exceed one page in length. Students should research their state fish including its physical description, habitat, behavior, and anything else they find interesting. For more information on contest rules and regulations, see page 62.

3) Illustration

Approximate time: 1 to 2 class periods

Assign an art project as part of ***The Wildlife Forever State-Fish Art Contest.*** Art techniques may include scratchboard, pointillism, chalk, charcoal, dry brush, watercolor, crosshatch, lead, collage, linoleum printing, or crayon. All entries must be horizontal, on an 8½" x 11" standard piece of paper without a mat, frame, cover sheet, or
border. Photographs and computer-generated artwork will not be accepted. (Please note: if the students use chalk or lead they will have to seal it with an adhesive.) For more information on contest rules and regulations, see page 62.

Reflection opportunity or post-test

- Revisit anticipatory setting questions.
- Identify several examples of how fish are adapted to life under water.
- Ask students what they will remember most from the procedure-related activity.

Extension Activities

Share and Share Alike
Ask students to share their artwork with their classmates in the form of a brief presentation. Students could also be encouraged to share one or two nuggets of information about their state fish that they found especially interesting.

Word Web
Write the word "fish" on the chalkboard or whiteboard. Ask students to brainstorm all the words they can think of related to fish. Record their responses. Then draw lines to connect related words and ideas.

Aging
Divide students up into small groups. Provide each of them with a microscope and a scale from a fish. Ask students to determine the age of the fish by counting the number of annual rings in the scale.

Guest Speaker
Invite a fisheries biologist in for the day.

Poetry
Ask students to write a poem about fish. They could use diamanti or picture poetry.

Diamanti poetry

Noun

Adjective, adjective

Participle, participle, participle

Noun, noun, noun, noun

Participle, participle, participle

Adjective, adjective

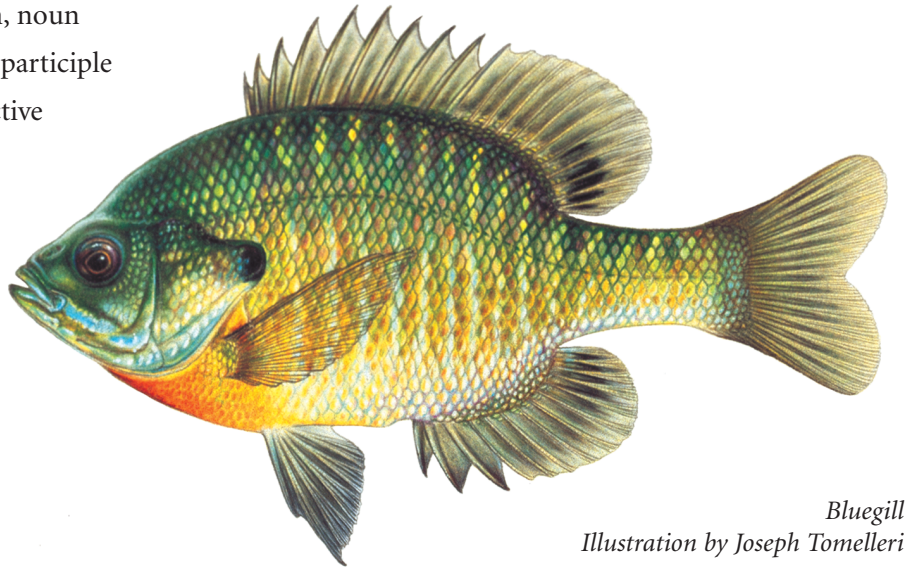
Noun

Field Trip
Visit an aquarium or fish hatchery in your area.

Get Involved
Organize a lakeshore or stream-bank clean-up effort.

Assessment Options

- Assign student workbook pages.
- Observe and assess student participation in procedure(s).
- Observe and assess student participation in selected extension activities.
- Select appropriate questions from quiz provided.



Bluegill
Illustration by Joseph Tomelleri

À la Carte Quiz

NAME _____

Select the appropriate questions for grade levels 4-12.

True or False

1) There are approximately 2,000 different species of fish in North America. T or F

2) Fish represent more than ½ of all vertebrates. T or F

3) Most fertilized fish eggs do not live to maturity. T or F

Fill in the blank

1) _____ fin serves as a propeller and helps to steer.

2) _____ fin is vertical or upright from the back and helps fish to avoid rolling.

3) _____ fins are found on either side of the fish just behind the head.

4) _____ is an internal balloon-like organ that helps to regulate floatation.

5) _____ serve as a flexible, protective armor.

6) _____ is a unique system of sensory nerves located in the skin that senses movement.

7) _____ is an adaptation that enables fish to disguise themselves.

8) _____ are chemical scents used to communicate.

Short answer

1) Define vertebrate.

2) Define plankton.

Essay

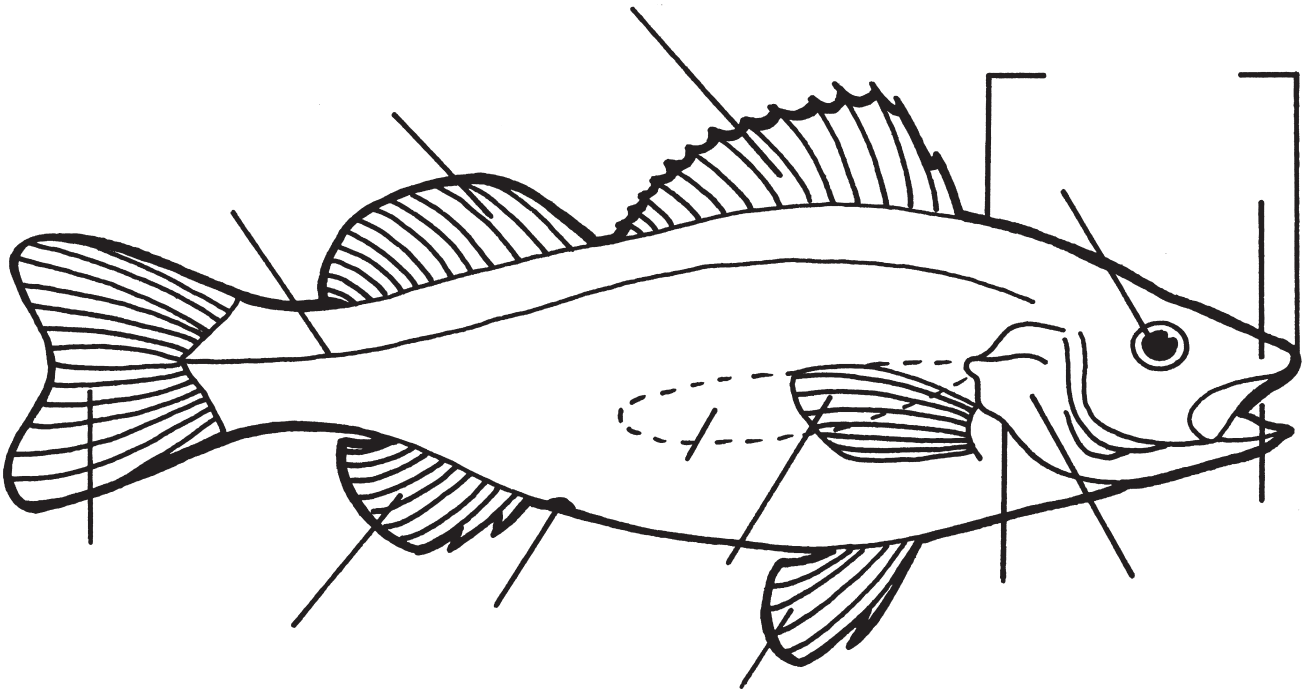
Draw an aquatic food chain.

Briefly describe how gills function.

Fill in the Blanks

NAME _____

Directions: Label the parts of the fish and briefly describe their function.



Word Search

NAME _____

N X C H A N N E L C A T F I S H P R T P D D I W E
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A S A G I K L X J S M E P G E M A G O E G M O V P
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S J C R I S E I C K E U R W D U B I T B L E P F I
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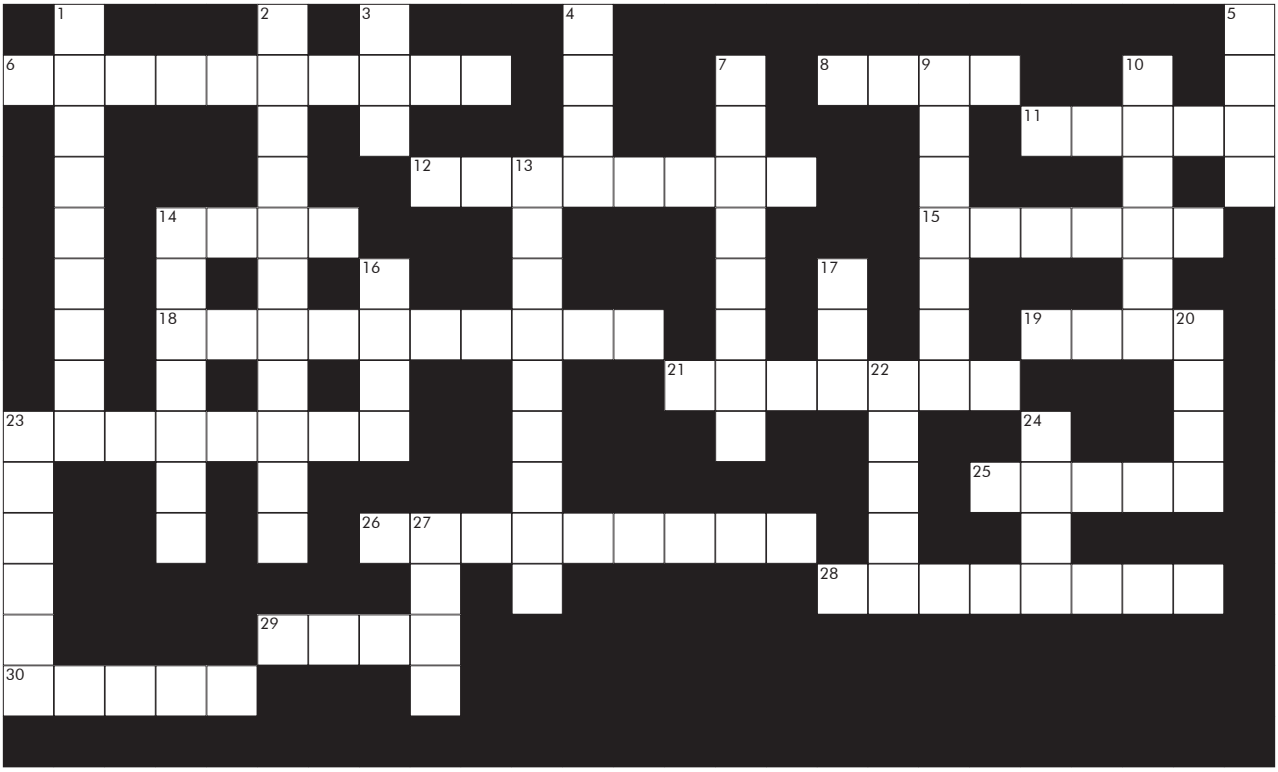
U S V P A G K B M X E N O L F G H U A Z L Q H U X

Apache Trout
Atlantic Cod
Atlantic Sailfish
Bluegill
Brook Trout
Channel Bass
Channel Catfish
Chinook Salmon
Cutthroat Trout
Garibaldi
Golden Trout
King Salmon
Largemouth Bass
Muskellunge
Northern Pike
Rainbow Darter
Spotted Bass
Steelhead Trout
Striped Bass
Tarpon
Walleye
Weakfish
White Bass
White Crappie

Crossword

NAME _____



Across

6. Name for an immature fish
8. Fish and reptiles are _____-blooded
11. Thin plate on fish
12. Fins on side of a fish
14. Fish deposit these into a redd
15. A foreign species introduced to an area from another region
18. Fish species whose population is in great decline
19. Walleyes are named for their milky _____
21. A brook trout that migrates up to the Great Lakes
23. The way a fish or animal responds to its environment
25. The number of fish legally allowed to be taken
26. Area a fish will defend during breeding season
28. Nickname for steelhead trout
29. Nest-like depression made by fish to contain eggs
30. Cutthroat trout do not successfully spawn in _____

Down

1. Southernmost species of cutthroat trout
2. Another name for humuhumunukunukuapua'a
3. Dorsal _____
4. A redd is a _____-like depression where fish deposit eggs
5. A fish hunted by other fish for food
7. Miscroscopic plants and animals eaten by fish
9. State permit that allows a person to fish
10. Naturally occurring species of fish
13. Fish that eats other animals
14. Area where fresh water and salt water meet
16. Name for dark oval marks on fish
17. A _____ bladder affects flotation of fish
20. Oceans have a high concentration of it
22. Cutthroat _____
23. Whisker-like appendage
24. Breathing organ of fish
27 Place where two streams come together

Mystery Math

NAME _____

Directions: Solve these math problems and then use the code to get a message about conservation.

Code
1 = B
2 = V
3 = P
4 = E
5 = I
6 = K
7 = R
8 = C
9 = A
10 = S
11 = M
12 = G
13 = Y
14 = F
15 = L
16 = J
17 = D
18 = Q
19 = W
20 = T
21 = N
22 = Z
23 = H
24 = O
25 = U
26 = X

57 ÷ 3	92 ÷ 23			121 ÷ 11	500 ÷ 20	91 ÷ 7 − 3	246 ÷ 82 + 17
192 ÷ 24	7 x 4 − 4	147 ÷ 7	85 ÷ 5 − 7	42 ÷ 7 − 2	126 ÷ 18	96 ÷ 6 − 14	76 ÷ 19
288 ÷ 12	1025 ÷ 41	98 ÷ 14					
115 ÷ 5 − 14	324 ÷ 18	216 ÷ 8 − 2	54 ÷ 6	133 ÷ 7 + 1	465 ÷ 93	728 ÷ 91	
427 ÷ 61	126 ÷ 42 + 1	182 ÷ 14 − 3	9 x 8 − 48	203 ÷ 7 − 4	255 ÷ 15 − 10	648 ÷ 81	819 ÷ 91 − 5	209 ÷ 11 − 9

Answer: ____ ____ ____ ____ ____ ____

____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

____ ____ ____ ____ ____ ____ ____

____ ____ ____ ____ ____ ____ ____ ____ ____

¿ la Carte Quiz

True or False

1) There are approximately 2,000 different species of fish in North America. T or F

2) Fish represent more than ½ of all vertebrates. T or F

3) Most fertilized fish eggs do not live to maturity. T or F

Fill in the blank

1) Caudal or tail fin serves as a propeller and helps to steer.
2) Dorsal fin is vertical or upright from the back and helps fish to avoid rolling.
3) Pectoral fins are found on either side of the fish just behind the head.
4) Gas bladder or swim bladder is an internal balloon-like organ that helps to regulate floatation.
5) Scales serve as a flexible, protective armor.
6) Lateral line is a unique system of sensory nerves located in the skin that senses movement.
7) Camouflage is an adaptation that enables fish to disguise themselves.
8) Pheremones are chemical scents used to communicate.

Short answer

1) Define vertebrate.
An animal with a backbone.

2) Define plankton.
Microscopic plants and animals.

Essay

Draw an aquatic food chain.
See illustration on page 12.

Briefly describe how gills function.
Gills are thin, feathery-like membranes located inside slit-shaped openings behind the head. Fish get oxygen from the water by passing it through their mouths and over their gills. Oxygen is absorbed through the gill membranes and carbon dioxide is removed.

Fill In the Blanks

Answers can be found on page 8.

Word Search

See page 22 for answers.

Crossword

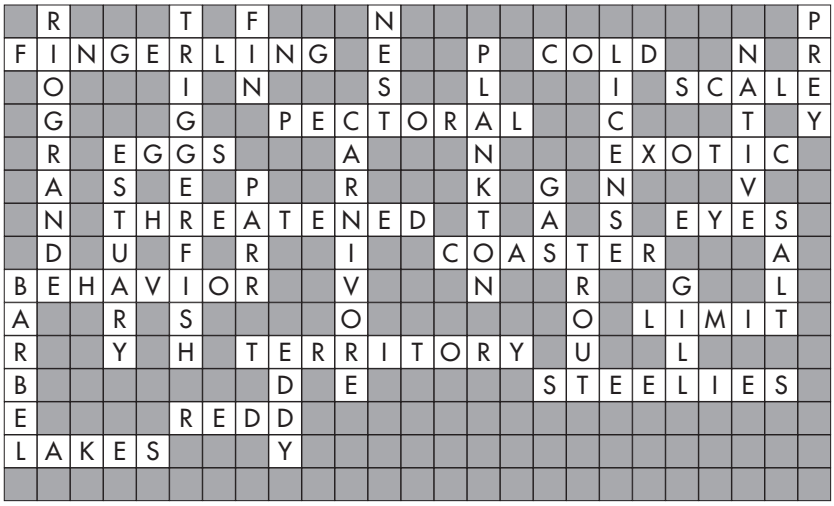
See page 22 for answers.

Mystery Math

19-4 11-25-10-20
8-24-21-10-4-7-2-4 24-25-7
9-18-25-9-20-5-8 7-4-10-24-25-7-8-4-10
We must conserve our aquatic resources.

Word Search

Crossword



Glossary of Terms

A

Adaptation: a particular characteristic of a plant or animal that makes it better suited to its environment.
Amphibians: cold-blooded, smooth skinned, vertebrate wildlife species including frogs, toads, newts, and salamanders. Amphibians spend part of their life on land and part of in water.
Amphidromous: migrating between freshwater and saltwater for reasons other than spawning (breeding).
Anadromous: migrating from an ocean into a freshwater river to spawn.
Arthropod: an animal without an internal backbone, including insects and crayfish.

B

Barbels: whisker-like appendages with sensory capabilities.
Behavior: the way an animal responds to its environment.

C

Camouflage: a protective adaptation that enables a fish to disguise itself or blend with its surroundings.
Carnivore: a fish that eats other animals, a meat eater.
Carrion: the body of a dead animal in the natural state of decay, which serves as a food source for some animals.
Cold-blooded (ectothermic): an animal whose body temperature is dependent upon and varies with the temperature of its environment, i.e. fish, amphibians, and reptiles.
Communication: any sound, scent, or behavior recognized by members of the same species.
Competition: the result of different species of animals that use the same source for food or shelter.
Conservation: the care, wise-use, and management of a resource.
Consumer: a fish that gets its food from producers (plants).
Courtship: behavior that attracts a mate in the state of reproductive readiness.
Cover: naturally occurring sheltered areas, which provide concealment shelter, i.e. a submerged tree, log, or rock outcroppings.

E

Ecosystem: an interacting system of plants, animals, soil, and climactic conditions in a self- contained environment, i.e. pond, marsh, swamp, lake, or stream.
Endangered: a species in danger of becoming extinct due to declining population numbers.
Environment: the entire surroundings of an organism (plant or animal) or group of organisms.
Estuary: area where fresh water and salt water meet.
Extinct: a species that no longer exists or has died out.

F

Fingerling: an immature fish.
Food chain: a group of plants and animals linked together as sources and consumers of food.
Food web: the many possible feeding relationships found within a given ecosystem.
Fresh water: a body of water that contains little salt in it, i.e. pond, lake, or stream.
Fry: an immature fish.

G

Gas bladder or swim bladder: an internal balloon-like organ, which affects floatation by selectively taking in gases from the blood stream.

H

Habitat: the local environment in which an animal lives. Components of habitat include an arrangement of food, water, cover (shelter), and space.
Herbivore: a fish that eats only plant material.

I

Invertebrates: animals without backbones, including insects *(Arthropoda)*, earthworms *(Annelida)*, and jellyfish *(Coelenterata)*.

L

Lateral line: a system of sensory nerves in the skin, which detects the movement of water and other fish. The lateral line extends from head to tail on either side of the fish.

M

Migration: the seasonal movements of fish and wildlife from one area to another; usually triggered by the length of daylight hours.
Milt: the semen of a male fish.

O

Obliterative camouflage: a protective color pattern of dark on top and light underneath.
Omnivore: an animal that eats both plants and animals (meat).

P

Pheromone: a chemical scent secreted as a means of communication between members of the same species.
Photosynthesis: a series of chemical changes in which plants combine sunlight, gasses, and water to form sugar or food.
Plankton: microscopic plants and animals that are eaten by fish and other aquatic life.
Predator: an animal that hunts and feeds on other animals.
Prey: an animal hunted or killed for food by other animals (predators).
Producer: plant that obtains energy from the sun and produces food through the process of photosynthesis.

R

Redd: a nest-like depression made by a male or female fish to contain eggs.

S

Salt water: a body of water with a high concentration of salt in it, i.e. oceans and seas.
School: a group of fish.

T

Territory: the area a fish will defend, usually during breeding season, against intruders of its own species.
Threatened: a classification used to describe a species whose population is in great decline and approaching the "endangered" classification.

V

Vertebrate: an animal with a backbone; includes fish, birds, mammals, and reptiles.

W

Warm-blooded (endothermic): an animal whose body temperature is unrelated to its environment, i.e. mammals and birds.

Montana's Pride

On February 10, 1977, Governor Thomas Judge signed the law designating the Black Spotted Cutthroat Trout as Montana's state fish. The cutthroat trout has a scientific name, salmo clarkii, also known as oncorhynchus clarkii. It bears the name because it was first identified by William Clark, of the Lewis and Clark expedition, at the Great Falls of the Missouri in 1805.

The State Fish bill was introduced in the 45th Montana Legislature and passed by wide margins in both houses. The other main competitor for the honor was the Montana Grayling. Both of these fish were on the Threatened Species List. It was hoped that by this increased attention both fish would benefit.

The people in favor of designating a state fish set six criteria. These were: 1) native to Montana, 2) not already adopted by another state, 3) well accepted by the people, 4) a game fish, 5) distinctive in appearance, and 6) found in more than one area of the state. The cutthroat met these criteria and was also claimed to be a "fighting, good-eating, and beautiful fish." Montana has taken steps to preserve this special fish and its residents are proud to have the cutthroat represent our state.

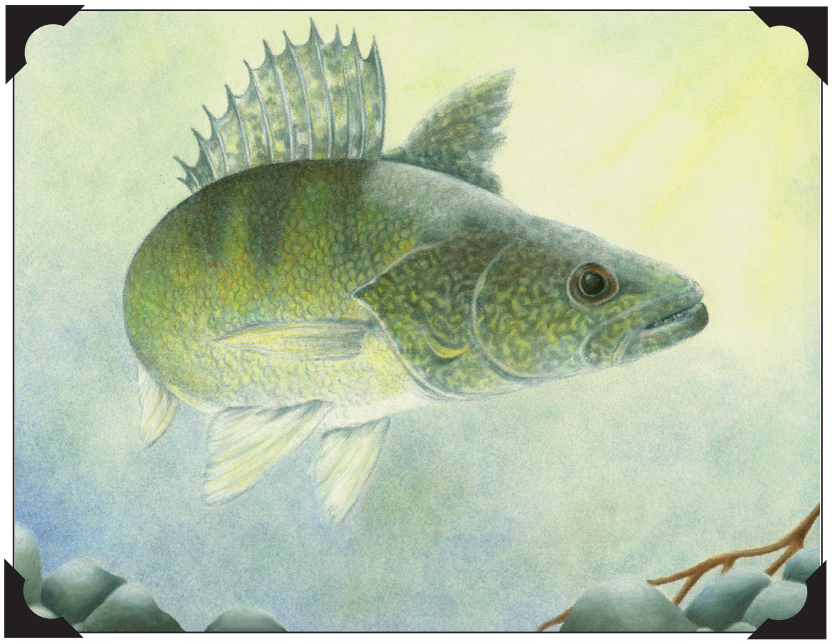
Example from Grades 7–9
Montana winner

Species Identification Section

State	Fish	Page
Alabama	Largemouth Bass	48
Alabama	Tarpon	57
Alaska	King Salmon	45
Arizona	Apache Trout	29
Arkansas	Longear Sunfish*	49
California	Garibaldi	40
California	Golden Trout	41
Colorado	Greenback Cutthroat Trout	42
Connecticut	Brook Trout*	34
Delaware	Weakfish	59
Florida	Atlantic Sailfish	31
Florida	Florida Largemouth Bass	39
Georgia	Largemouth Bass	48
Hawaii	Humuhumunukunukuapua'a*	44
Idaho	Cutthroat Trout	38
Illinois	Bluegill	32
Indiana	Largemouth Bass*	48
Iowa	Channel Catfish*	36
Kansas	Channel Catfish	36
Kentucky	Spotted Bass	54
Louisiana	White Crappie	61
Maine	Landlocked Salmon	47
Maryland	Striped Bass	56
Massachusetts	Atlantic Cod	30
Michigan	Brook Trout	34
Minnesota	Walleye	58
Mississippi	Largemouth Bass	48
Missouri	Channel Catfish	36
Missouri	Paddlefish	52
Montana	Cutthroat Trout	38
Nebraska	Channel Catfish	36
Nevada	Lahontan Cutthroat Trout	46
New Hampshire	Brook Trout	34
New Hampshire	Striped Bass	56
New Jersey	Brook Trout	34
New Mexico	Rio Grande Cutthroat Trout	53

New York	Brook Trout	34
North Carolina	Channel Bass	35
North Dakota	Northern Pike	51
Ohio	Walleye*	58
Oklahoma	White Bass	60
Oregon	Chinook Salmon	37
Pennsylvania	Brook Trout	34
Rhode Island	Brook Trout*	34
South Carolina	Striped Bass	56
South Dakota	Walleye	58
Tennessee	Channel Catfish	36
Tennessee	Largemouth Bass	48
Texas	Guadalupe Bass	43
Utah	Bonneville Cutthroat Trout	33
Vermont	Brook Trout	34
Vermont	Walleye	58
Virginia	Brook Trout	34
Washington	Steelhead Trout	55
West Virginia	Brook Trout	34
Wisconsin	Muskellunge	50
Wyoming	Cutthroat Trout	38

**This state does not have an official state fish, but its state department of natural resources chose this fish for the contest.*



Future Walleye Fishing

The fishing line was lying limp in the water. A little nibble occurs now and then that keeps you on the edge of your seat waiting and anticipating the big catch. All of a sudden you give a good jerk and you have a good-sized walleye fighting against you on the other end of the line. All fishermen and women love the thrill of a good-sized catch. The question is, can we keep the fish numbers up and the fish habitats clean for future fishing enjoyment?

South Dakota is one of the best walleye producing states in the nation. The milk-eyed walleye is the most popular and sought after fish by anglers in my area. The walleye is know to have a white tip on the bottom of the caudal fin and a black blotch on the end of the dorsal fin. It likes darker fresh water to live in and feeds on insects, invertebrates, and other small fish. The lake levels have risen in eastern South Dakota where I live, which improves the fish habitat and benefits the fish production.

We can preserve the future of fishing by choosing to conserve and protect the fish and their environment so later generations of children and families have as much fishing enjoyment as we do now.

Example from Grades 10–12
South Dakota winner

Apache Trout

Oncorhynchus apache

Illustration by Joseph Tomelleri

Common Name	Arizona trout
Identifying Features	Apache trout have rich, olive-green sides and a golden-yellow belly and darken to brass or copper on their head. They have orange-red "cutthroat" marks below their lower jaw.

TYPICAL ADULT

Length	Up to 18 inches in lakes and 6 inches in streams
Weight	Up to 3 pounds
Life span	Unknown
Habitat	Apache trout inhabit clear lakes and forested streams of the White Mountain area in east central Arizona.
Feeding Behavior	Apache trout feed on smaller fish and insects.
Reproductive Behavior	WHEN: Spring or early summer HOW: The female constructs a nest-like depression called a "redd" over loosely covered gravel and lays about 200-600 eggs while males swim by and fertilize them.

Did you know?

The Apache trout is one of only two trout native to Arizona. The White Mountain Apache Tribe is actively helping the U.S. Fish and Wildlife Service to improve the population numbers of the Apache trout, which is listed as a "threatened species" by the U.S. Fish and Wildlife Service.

Atlantic Cod

Gadus morhua

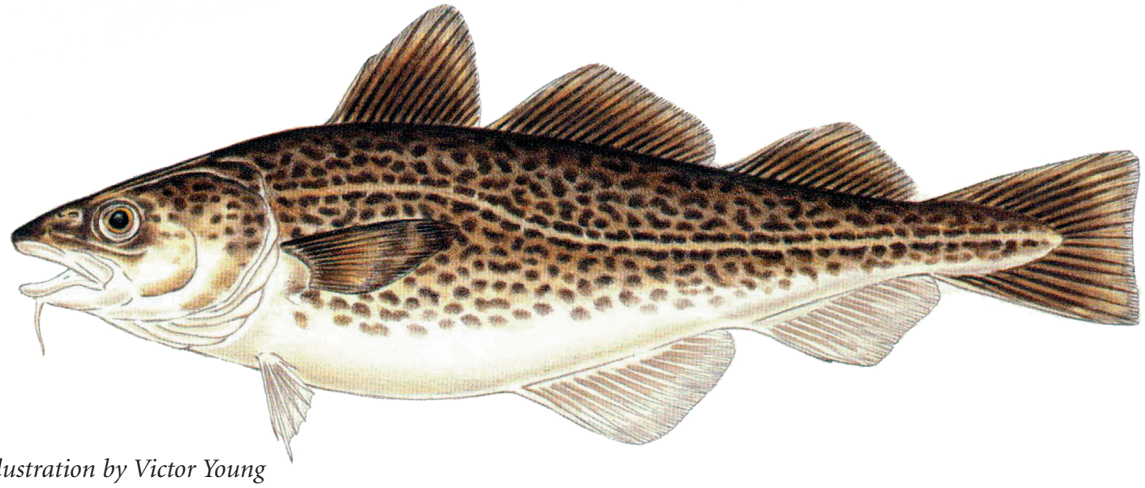


Illustration by Victor Young

Common Name	cod
Identifying Features	Atlantic cod have one barbel (whisker) on the chin. Their coloration is variable depending on their surroundings. The back may be brown or green, yellow or red, or a combination of these colors. Atlantic cod have a light-colored belly and a long, light, lateral band along their body.

TYPICAL ADULT

Length	Up to 72 inches
Weight	Up to 12 pounds
Life span	Up to 20 or more years
Habitat	Atlantic cod are found in coastal waters, usually on or near the bottom of the continental Atlantic shelf, from New England to the Mid-Atlantic states. The preferred water temperature is cold.
Feeding Behavior	Atlantic cod feed on crustaceans, mollusks, sea squirts, worms, and other fish.
Reproductive Behavior	WHEN: Winter or spring PREFERRED WATER TEMPERATURE: 28-34°F HOW: The female cod lays more than 9 million fertilized eggs into the sea, where the eggs will float and are vulnerable to wind and predators.

Did you know?

The Atlantic cod has two color phases: red and gray. It can survive at depths of 1,500 feet.

Atlantic Sailfish

Istiophorus platypterus

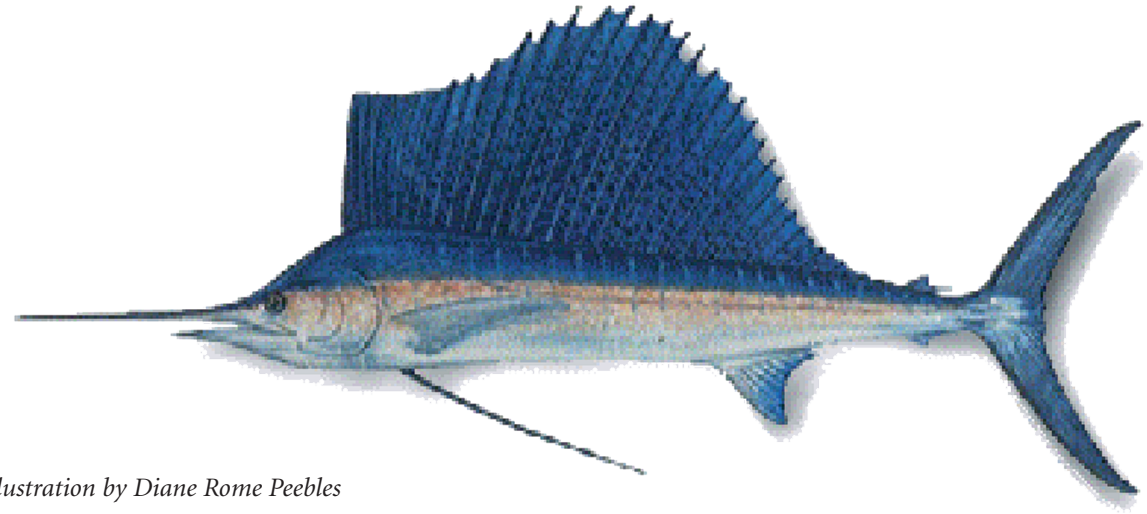


Illustration by Diane Rome Peebles

Common Names	sailfish, sail, spikefish, spindlebeak, spindlesnoot, mylmeen
Identifying Features	Atlantic sailfish have a long bill and a long, slender body of dark blue with silvery flanks and belly. Their blue dorsal fin has dark spots and is two times the height of the fish itself.

TYPICAL ADULT

Length	Up to 84 inches (may reach 100 inches)
Weight	Up to 37 pounds
Life span	Up to 10 years
Habitat	Sailfish inhabit warm (above 70°F) Atlantic and Pacific waters.
Feeding Behavior	Atlantic sailfish feed on smaller fish, squid, and crustaceans.
Reproductive Behavior	WHEN: Summer HOW: The female swims near the surface of the water with one or more males and releases over 4 million eggs each year. The male fertilizes them, and the eggs hatch within two days.

Did you know?

The Atlantic sailfish can swim up to 60 miles per hour over short distances. Also, Atlantic sailfish grow very quickly. In its first year, an Atlantic sailfish can grow up to five feet!

Bluegill

Lepomis macrochirus

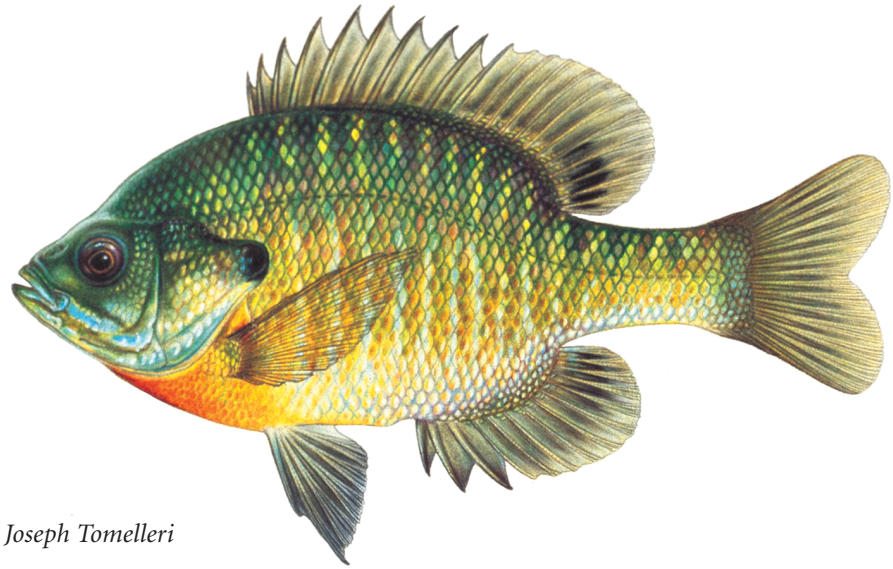


Illustration by Joseph Tomelleri

Common Names	sun perch, bream, brim, blue sunfish, copperbelly, roach
Identifying Features	Bluegills have an olive to bronze back, with blue and orange sides. Two to five bluish bars extend from the mouth.

TYPICAL ADULT

Length	Up to 10 inches (sometimes up to 15 inches)
Weight	Up to 1 pound (sometimes over 4 pounds)
Life span	Up to 11 years
Habitat	Bluegills inhabit quiet and moderately weedy lakes, ponds, bays, and slow-moving streams.
Feeding Behavior	Bluegills feed on larval and adult insects, plankton, snails, fish fry (young), and sometimes aquatic plants.
Reproductive Behavior	WHEN: Spring PREFERRED WATER TEMPERATURE: 68-70°F HOW: The male builds a nest on a sand or gravel bottom near other bluegill nests. The female lays eggs in the nest. The male guards the nest and the fry.

Did you know?

Larger bluegills are found in deeper waters than small ones. Also, male northern bluegills become darker and more orange in color during the spawning season.

Bonneville Cutthroat Trout

Oncorhynchus clarki utah

Illustration by Joseph Tomelleri

Common Names	native trout, Utah trout, blueheads
Identifying Features	Bonneville cutthroat trout have a yellowish body with uniform spotting. Larger spots are found on the back half of the fish. They also have orange fins and red-orange "slash" marks on their throat.

TYPICAL ADULT

Length	Up to 18 inches in streams and 30 inches in lakes
Weight	Up to 4 pounds in streams and 18 pounds in lakes
Life span	Up to 20 or more years
Habitat	Bonneville cutthroat trout inhabit mountain streams and lakes in the Bonneville Basin of Utah, Wyoming, Nevada, and Idaho.
Feeding Behavior	Bonneville cutthroat trout eat plankton (passively floating, minute animal and plant life), insects, and fish.
Reproductive Behavior	WHEN: Spring or summer, depending on elevation HOW: The female digs nest-like depressions called "redds" in gravelly riffles in streams. Adults do not guard the nest.

Did you know?

Legend has it that the early pioneers were saved from starvation many times by catching this native trout. Today, the Bonneville cutthroat is listed as a "sensitive species" by the U.S. Fish and Wildlife Service.

Brook Trout

Salvelinus fontinalis

Illustration by Joseph Tomelleri

Common Names	eastern brook trout, brookie, speckled trout, native trout, squaretail
Identifying Features	Brook trout have a dark olive body with a brownish to greenish back and light worm-like markings. The sides are pale with several small red spots with blue borders. The lower fins have dark and light edges.

TYPICAL ADULT

Length	Up to 18 inches (sometimes up to 34 inches)
Weight	Up to 3 pounds (may reach 14 pounds)
Life span	Up to 15 years
Habitat	Brook trout inhabit clear and cold streams, lakes, and ponds, often with access to sea, but are mostly found in the headwaters of spring-fed streams.
Feeding Behavior	Brook trout feed on tiny larval insects, small fish, and occasionally, field mice and snakes.
Reproductive Behavior	WHEN: Late summer and fall PREFERRED WATER TEMPERATURE: 40-49°F HOW: The female digs several redds (depressions) in a gravel bed in the headwaters of a small stream. Adults do not guard the nest.

Did you know?

A sea-run brook trout is known as a "salter" or "sea trout." A brook trout in the Great Lakes that migrates up its tributaries to spawn is known as a "coaster."

Channel Bass

Sciaenops ocellatus

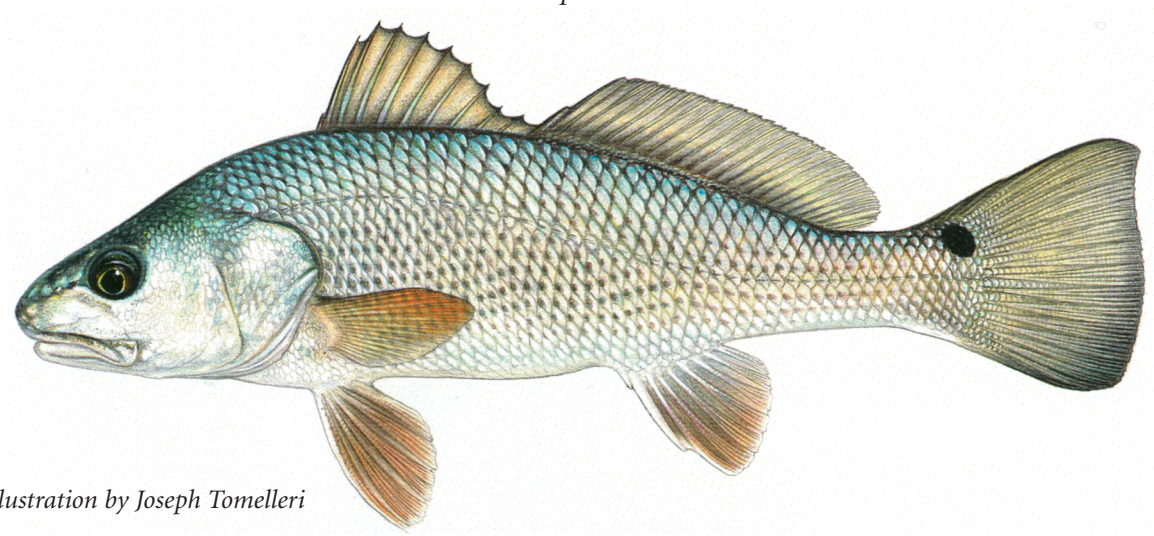


Illustration by Joseph Tomelleri

Common Names	red drum, redfish, spot-tail bass, red bass, red dorse, school drum, puppy drum
Identifying Features	Channel bass have a copper-red body with one or more black spots on the tail.

TYPICAL ADULT

Length	Up to 27 inches
Weight	Up to 40 pounds (sometimes as big as 95 pounds)
Life span	Up to 20 or more years
Habitat	Juvenile channel bass are found inshore, in bays and channels off the Atlantic and Gulf coasts. As the juvenile grows to adult, around age 4, it prefers colder temperatures and moves back to the oceans.
Feeding Behavior	Channel bass feed on crustaceans, fish, and mollusks.
Reproductive Behavior	WHEN: Summer or fall PREFERRED WATER TEMPERATURE: About 75°F HOW: The channel bass migrate out of estuaries (water where a river meets the sea) and lagoons into deeper water near the mouths of bays and inlets. The female broadcasts eggs randomly and the male fertilizes them.

Did you know?

Female channel bass can lay over a million eggs when they spawn.

Channel Catfish

Ictalurus punctatus

Illustration by Joseph Tomelleri

Common Names	spotted cat, blue channel cat, Great Lakes catfish, lady cat
Identifying Features	Channel catfish have eight barbels (whiskers), an olive-green to bluish body with dark spots, and a deeply forked tail.

TYPICAL ADULT

Length	Up to 24 inches
Weight	Up to 20 pounds
Life span	Up to 11 years
Habitat	Channel catfish inhabit deep streams, rivers, and lakes in eastern and central U.S., especially in deep stretches of sand, gravel, or rubble bottom. They also inhabit lakes, reservoirs, and ponds.
Feeding Behavior	Channel catfish feed on insect larvae, clams, snails, crayfish, crabs, and aquatic plants. They locate food by probing the bottom with their barbels.
Reproductive Behavior	WHEN: Late Spring-Summer PREFERRED WATER TEMPERATURE: 70-75° F HOW: The male builds the nest in dark secluded spots under logs, the shade of boulders, holes in riverbanks, or barrels. The female scatters the eggs in the nest. The male guards the nest.

Did you know?

Young channel catfish are called "fiddlers." During the 1950s, commercial fisherman harvested nearly 270,000 pounds of channel catfish each year from the Mississippi River.

Chinook Salmon

Oncorhynchus tshawytscha

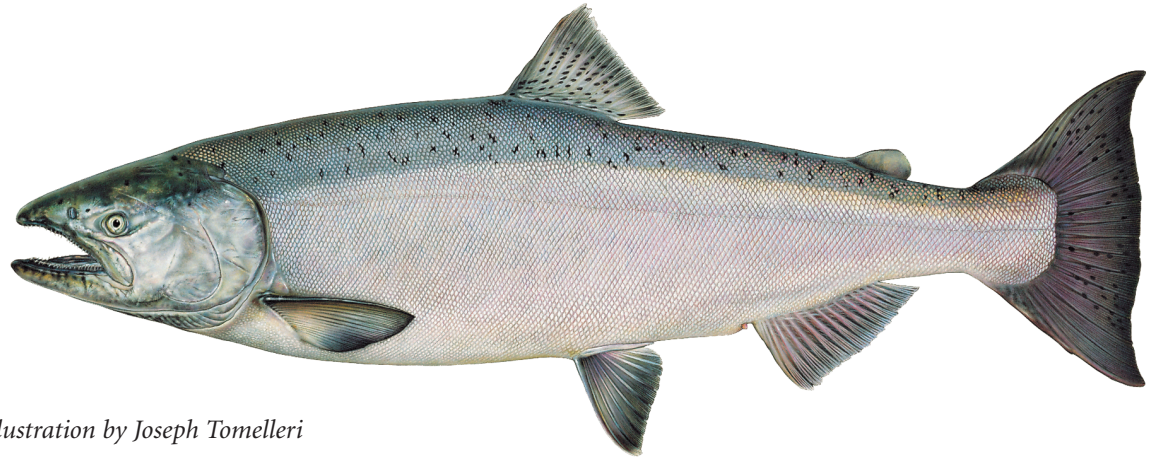


Illustration by Joseph Tomelleri

Common Names	king salmon, spring salmon, tyee, quinnat, blackmouth, blackjaw
Identifying Features	Chinook salmon have a silver body with dark spots on the back and tail. They also have black gums.

TYPICAL ADULT

Length	Up to 46 inches (sometimes up to 58 inches)
Weight	Up to 43 pounds (sometimes up to 125 pounds)
Life span	Up to 9 years
Habitat	An anadromous (entering a river from the sea to breed) fish, the Chinook salmon lives in the northern Pacific Ocean but enters large Pacific coastal streams to spawn.
Feeding Behavior	Chinook salmon feed on other fish, as well as squid, shrimp, crab larvae, and other crustaceans.
Reproductive Behavior	WHEN: Fall, but may have separate runs in the spring PREFERRED WATER TEMPERATURE: 40-55°F HOW: The female digs a large nest-like depression called a "redd" in a deep gravel riffle of main stream channels. She is accompanied by one dominant male and several smaller ones called "jacks." The female guards the nest.

Did you know?

After spawning, the female Chinook salmon guards the nest for up to two weeks and then dies. The redd is sometimes 12 feet long and 1 foot deep. Some Chinook salmon swim as far as 1,500 miles upstream to spawn.

Cutthroat Trout

Oncorhynchus clarki

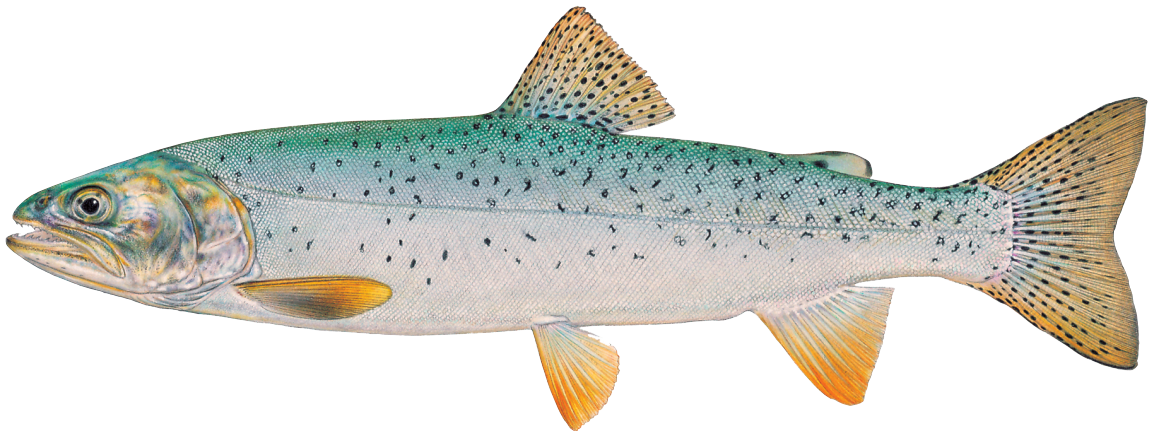


Illustration by Joseph Tomelleri

Common Name	native trout, cut, red throat, mountain trout, black-spotted trout
Identifying Features	Cutthroat trout have a greenish back with black spots. Their sides are olive to silver in color. They have a red "cut-throat" mark on their lower jaw.

TYPICAL ADULT

Length	Up to 19 inches
Weight	Up to 5 pounds (may reach 40 pounds)
Life span	Up to 7 years
Habitat	Cutthroat trout inhabit cold streams and mountain lakes in the western U.S.
Feeding Behavior	Cutthroat trout feed on insects, small fish, and occasionally trout eggs, crustaceans, frogs, and earthworms.
Reproductive Behavior	WHEN: Spring PREFERRED WATER TEMPERATURE: 55-62°F. HOW: The female constructs nest-like depressions called "redds" by brushing aside gravel in small streams. The adults do not guard the nest.

Did you know?

There are 14 different recognized subspecies of cutthroat trout. Cutthroat trout do not successfully spawn in lakes.

Florida Largemouth Bass

Micropterus salmoides floridanus

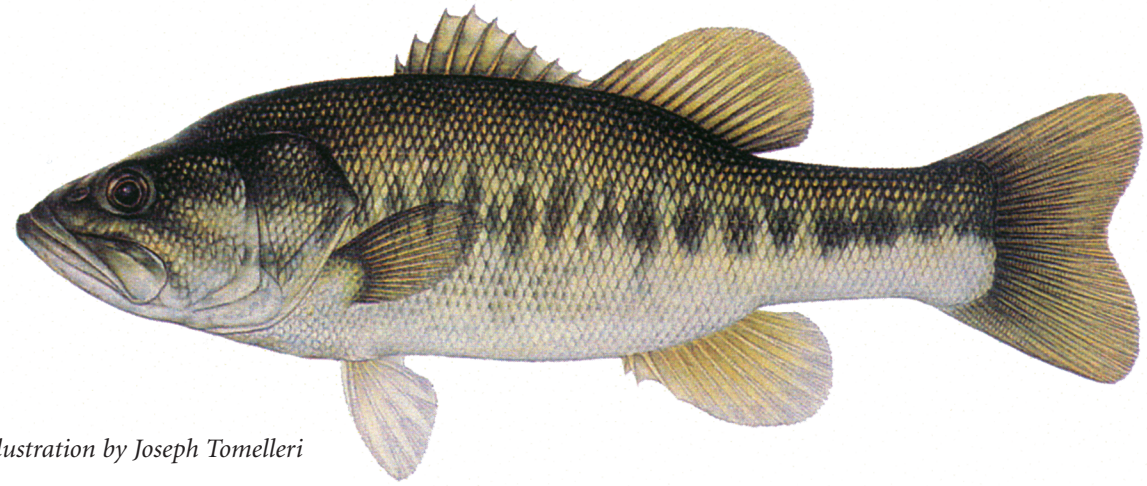


Illustration by Joseph Tomelleri

Common Name	Florida bass
Identifying Features	Florida largemouth bass have a greenish back and a cream-colored belly. They have diamond-shaped vertical bars on their sides and a fin along the back that has a notch almost down to the back.

TYPICAL ADULT

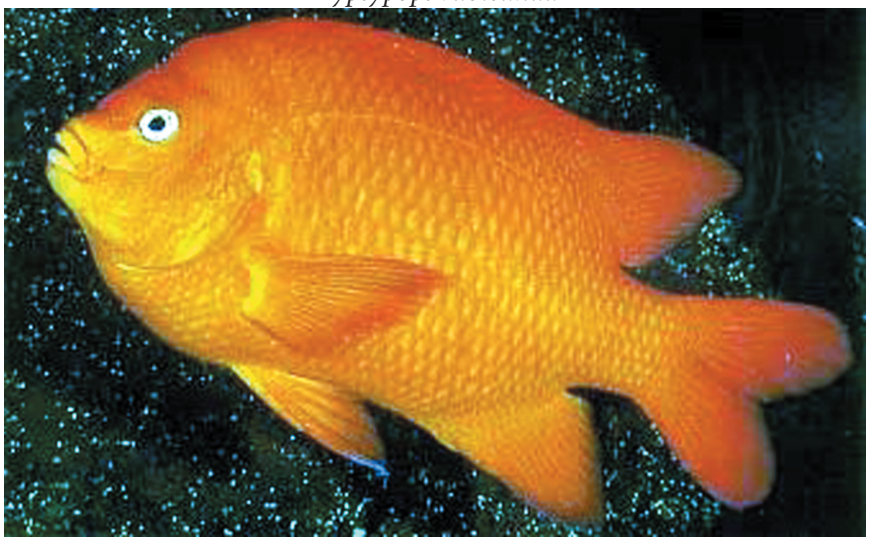
Length	Up to 25 inches
Weight	Up to 10 pounds
Life span	Up to 10 years
Habitat	The Florida largemouth bass inhabits weedy lakes and ponds with firm, sandy bottoms.
Feeding Behavior	Florida largemouth bass eat other fish, insects, and invertebrates. The young feed on zooplankton.
Reproductive Behavior	WHEN: Spring PREFERRED WATER TEMPERATURE: 63-68°F HOW: The male digs a circular-shaped nest with its tail. The female lays eggs and the male fertilizes them. The male primarily guards the nest and the fry (young), although the female may help.

Did you know?

Each Florida largemouth bass nest may contain as many as 43,000 eggs.

Garibaldi

Hypsypops rubicunda



Photograph by National Audubon Society

Common Name orange-colored sunfish

Identifying Features Garibaldi have a brilliant orange body with large body scales and a deeply forked tail fin. Juveniles have bright, iridescent blue spots on their body.

TYPICAL ADULT

Length Up to 14 inches

Weight Unknown

Life span Up to 17 or more years

Habitat Garibaldi inhabit swirling waters along rocky reefs in the Pacific Ocean, off the California coast from Monterey Bay to Baja.

Feeding Behavior Garibaldi eat sponges, small anemones, and occasionally worms and crabs.

Reproductive Behavior WHEN: Spring or summer
PREFERRED WATER TEMPERATURE: 59°F
HOW: The male builds a 1-1/2 foot nest on a reef, clearing away all the growth except for red algae. The male defends the nest against intruders, and when the female swims by, the male entices her through clicking sounds and dashing to and from the nest. After the female lays the eggs, she leaves while the male spends 2-3 weeks guarding the nest.

Did you know?

Garibaldi can live in ocean depths of up to 95 feet. Garibaldi are extremely territorial and defend their homes and nests through aggression rather than camouflage.

Golden Trout

Oncorhynchus aguabonita

Illustration by Joseph Tomelleri

Common Name	Kern River trout, mountain trout, goldie
Identifying Features	Golden trout have brilliant, gold sides with a red horizontal band and 10 dark oval marks called "parr marks." Their fins have white edges.

TYPICAL ADULT

Length	Up to 14 inches
Weight	Up to 1 pound in streams (up to 11 pounds in lakes)
Life span	Up to 7 years
Habitat	Golden trout inhabit cold mountain lakes and streams at altitudes above 6,000 feet. They have been stocked at lower elevations with moderate success.
Feeding Behavior	Golden trout feed on insects, especially caddis flies and midges, and also eat small crustaceans.
Reproductive Behavior	WHEN: Early to mid summer PREFERRED WATER TEMPERATURE: 48-52°F HOW: The female digs several redds (depressions) at the tail of a pool and deposits eggs. Adults abandon the nest.

Did you know?

The brilliant colors of the golden trout disappear if they are stocked at altitudes lower than 6,000 feet. Unlike other trout, the golden trout's parr marks persist throughout their adult life.

Greenback Cutthroat Trout

Oncorhynchus clarki stomias

Illustration by Joseph Tomelleri

Common Names	greenback trout, black-spotted trout
Identifying Features	Greenback cutthoat trout have a few large spots on their body called "parr marks." These are usually concentrated near the tail. They also have red "slash" markings on their gill covering.

TYPICAL ADULT

Length	Up to 18 inches
Weight	Unknown
Life span	Up to 7 years
Habitat	The greenback cutthroat trout inhabit the South Platte River, the Arkansas River, and the Colorado River.
Feeding Behavior	Greenback cutthroat trout feed on aquatic insects and other fish.
Reproductive Behavior	WHEN: Spring HOW: The adults display courtship-like behavior and then the female digs a large nest-like depression called a "redd" in gravelly riffles. The adults defend the egg for a period of time.

Did you know?

Habitat loss and the introductions of non-native trout, such as the rainbow, brook, and brown trout, led to the decline of greenback cutthroat numbers.

Guadalupe Bass

Micropterus treculi

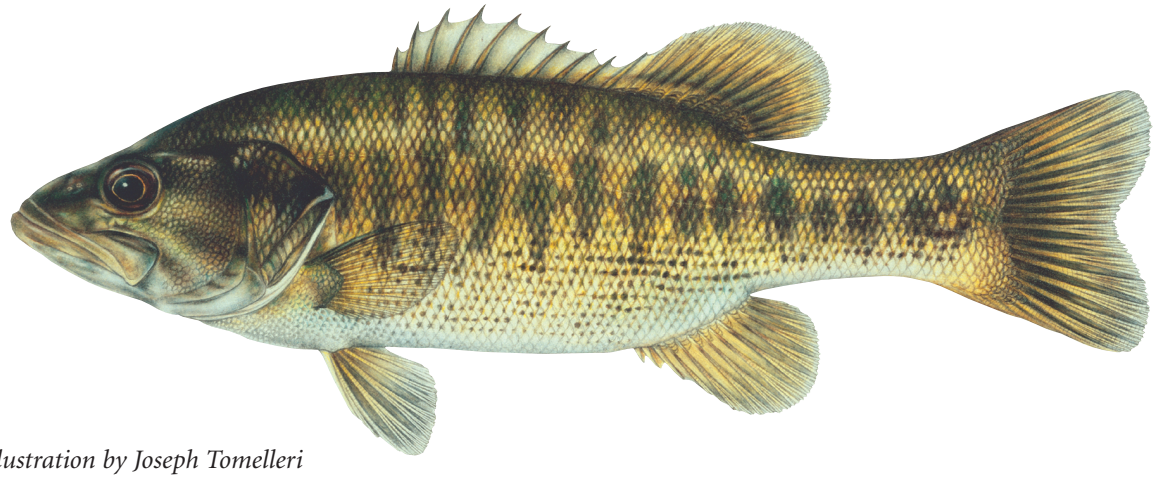


Illustration by Joseph Tomelleri

Common Names	black bass, Guadalupe spotted bass
Identifying Features	Guadalupe bass have a greenish body with 10-12 dark bars along the side (similar to a smallmouth bass).

TYPICAL ADULT

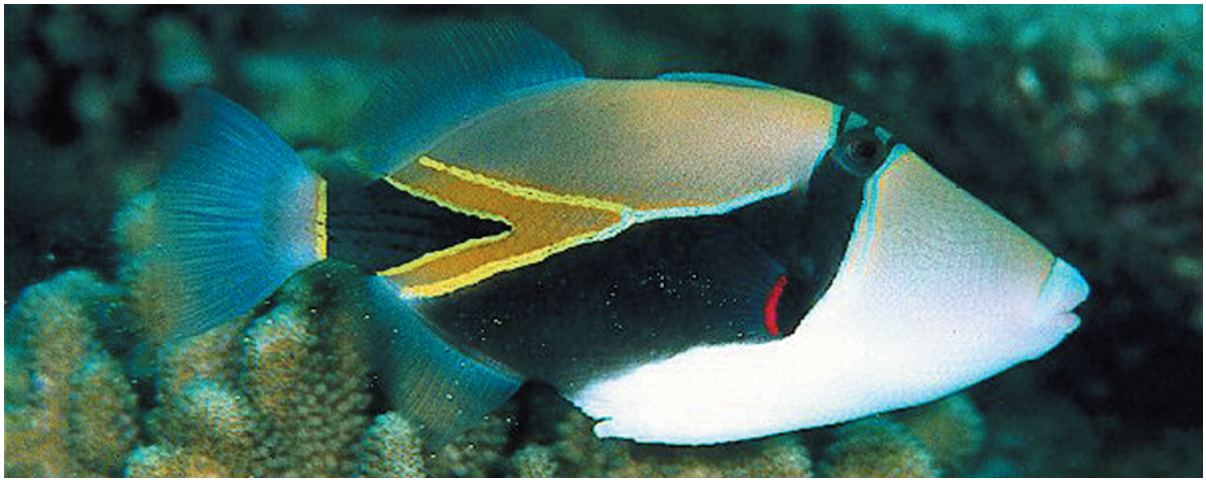
Length	Up to 12 inches
Weight	Up to 1 pound
Life span	Up to 7 years
Habitat	Guadalupe bass are found only in Texas. Guadalupe bass typically inhabit flowing water, including the headwaters of the San Antonio River, the Guadalupe River, the Colorado River, and portions of the Brazos River.
Feeding Behavior	Guadalupe bass feed on invertebrates and other fish.
Reproductive Behavior	WHEN: Spring or summer PREFERRED WATER TEMPERATURE: 60-65°F HOW: The male builds a gravel nest in flowing water. After the female lays up to 9,000 eggs, she is chased away and the male stands guard over the eggs until they are hatched.

Did you know?

Guadalupe bass may spawn a second time in the summer.

Humuhumunukunukuapua'a (Hawaiian Triggerfish)

Rhinecanthus rectanglus



Photograph by Keoki Stender

Common Names	Picasso triggerfish, reef triggerfish
Identifying Features	Humuhumunukunukuapua'a have a diamond-shaped body with armor-like scales. A dark stripe crosses their silver sides and belly. Their fins are pale blue. They are called a triggerfish because of their sharp, spike-like dorsal fin.

TYPICAL ADULT

Length	Up to 18 inches
Weight	Unknown
Life span	Unknown
Habitat	Humuhumunukunukuapua'a inhabit the tropical coral reefs of the Pacific Ocean.
Feeding Behavior	Humuhumunukunukuapua'a feed on bottom-dwelling invertebrates and seaweed.
Reproductive Behavior	HOW: The female builds a nest and the male fertilizes her eggs. The female defends the nest vigorously until the eggs are hatched.

Did you know?

Humuhumunukunukuapua'a means "fish with a pig's nose" in Hawaiian. The Humuhumukununukuapua'a sleeps on its side at night.

King Salmon

Oncorhynchus tshawytscha

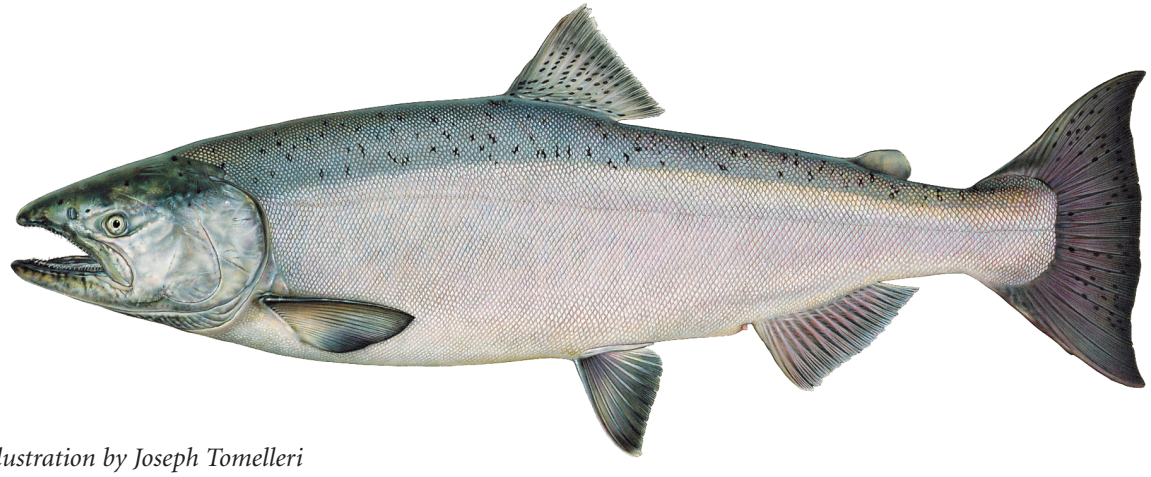


Illustration by Joseph Tomelleri

Common Name	Chinook salmon, spring salmon, tyee, quinnat, blackmouth, blackjaw
Identifying Features	King salmon have a silver body with dark spots on the back and tail. They also have black gums.

TYPICAL ADULT

Length	Up to 46 inches (sometimes up to 58 inches)
Weight	Up to 43 pounds (sometimes up to 125 pounds)
Life span	Up to 9 years
Habitat	An anadromous (entering a river from the sea to breed) fish, the king salmon lives in the Northern Pacific Ocean but enters large Pacific coastal streams to spawn.
Feeding Behavior	King salmon feed on other fish, as well as squid, shrimp, crab larvae, and other crustaceans.
Reproductive Behavior	WHEN: Fall, but may have separate runs in the spring PREFERRED WATER TEMPERATURE: 40-55°F HOW: The female digs a large nest-like depression called a "redd" in a deep gravel riffle of main stream channels. She is accompanied by one dominant male and several smaller ones called "jacks." The female guards the nest.

Did you know?

After spawning, the female king salmon guards the nest for up to two weeks and then dies. The redd is sometimes 12 feet long and 1 foot deep. Some king salmon swim as far as 1,500 miles upstream to spawn.

Lahontan Cutthroat Trout

Oncorhynchus clarki henshawi

Illustration by Joseph Tomelleri

Common Name	native trout
Identifying Features	Lahontan cutthroat trout have a golden-brown to olive back with black spots. They have red-orange slash marks around their throat.

TYPICAL ADULT

Length	Up to 25 inches
Weight	Up to 5 pounds
Life span	Unknown
Habitat	Lahontan cutthroat trout inhabit lakes, streams, and rivers in the Lahontan sub-basin of the American Great Basin in west-central Nevada.
Feeding Behavior	Unknown
Reproductive Behavior	WHEN: Spring or summer HOW: The adults display a courtship ritual, and then the female digs a large nest-like depression called a "redd" in gravelly riffles. The adults defend the egg for a period of time.

Did you know?

Previously unregulated fishing and the introduction of non-native species have reduced the Lahontan cutthroat populations to 11% of their original stream population and one-half of 1% of their original lake population. The U.S. Fish and Wildlife Service has placed the Lahontan cutthroat trout on its Threatened Species List.

Landlocked Salmon

Salmo salar

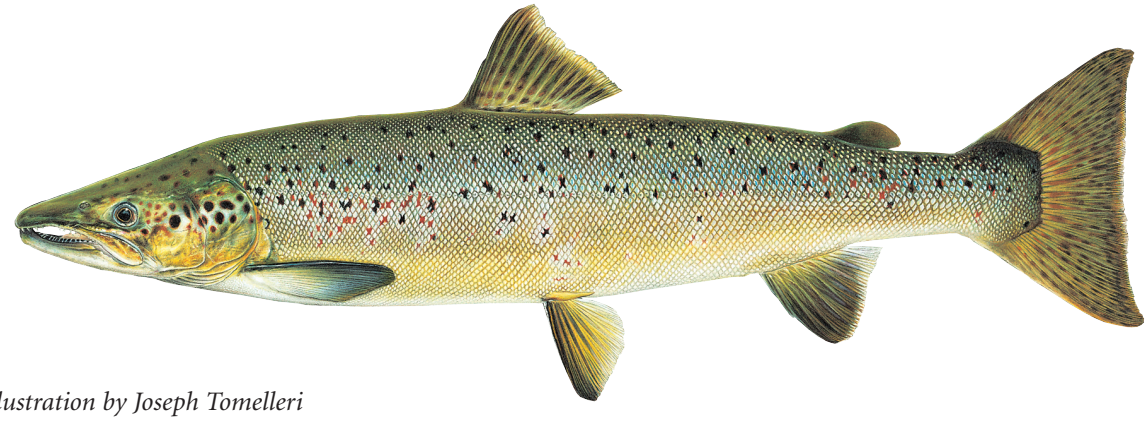


Illustration by Joseph Tomelleri

Common Names	Atlantic salmon, ounaniche, Sebago salmon
Identifying Features	Landlocked salmon have a gray-green back with a silver head and silver sides and a white belly. It has a series of black spots in a lateral line on its body.

TYPICAL ADULT

Length	Up to 36 inches (may reach 60 inches)
Weight	Up to 5 pounds
Life span	6 years
Habitat	Landlocked salmon inhabit clear, cold lakes (with gravelly inlets for spawning) on the Atlantic coast.
Feeding Behavior	Landlocked salmon eat crustaceans, insects, and small fish including herring and sardines.
Reproductive Behavior	WHEN: Fall PREFERRED WATER TEMPERATURE: 42-50°F HOW: The female digs a nest-like depression called a "redd" by brushing aside small gravel. The female deposits her eggs in the redd and then abandons the nest to return to the lakes.

Did you know?

When landlocked salmon spawn, they can swim far upstream, negotiating nearly impassable falls.

Largemouth Bass

Micropeterus salmoides

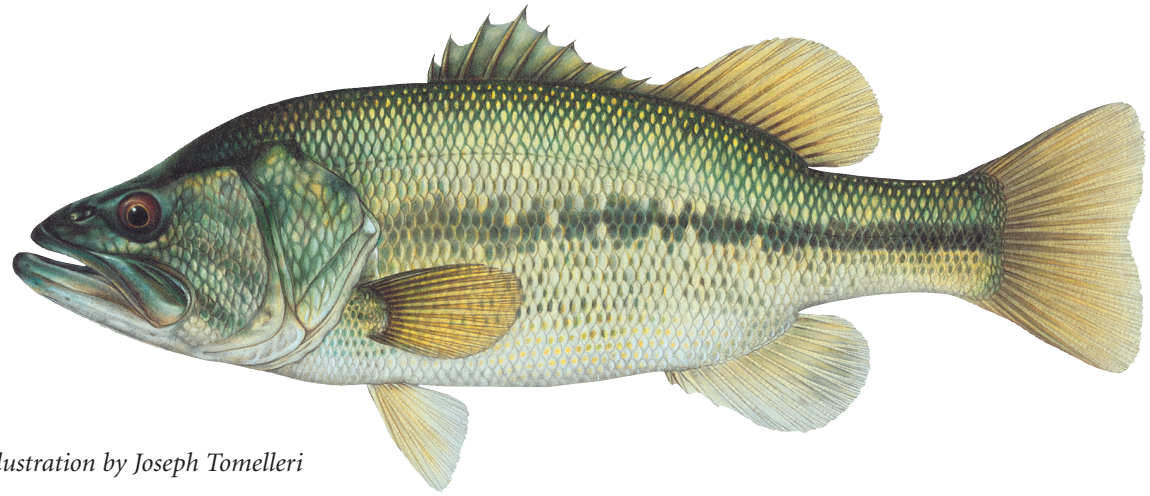


Illustration by Joseph Tomelleri

Common Names	black bass, green bass, bigmouth, linesides, bucketmouth
Identifying Features	Largemouth bass have a black to green back with lighter sides and a pale belly. They have a dark wavy band running the length of their sides. Their mouth extends beyond their eyes.

TYPICAL ADULT

Length	Up to 21 inches
Weight	Up to 10 pounds
Life span	Up to 15 years
Habitat	Largemouth bass inhabit weedy lakes and ponds and slow-moving rivers and streams throughout U.S. They prefer areas with lots of cover (brush, sunken logs, and rocks).
Feeding Behavior	Largemouth bass feed on whatever is available, including small fish, leeches, salamanders, frogs, snakes, and turtles. They also feed more heavily as the water temperature rises.
Reproductive Behavior	WHEN: Spring PREFERRED WATER TEMPERATURE: 63-68°F HOW: The male constructs a 2-3 foot nest by sweeping away debris with its head and tail. It will usually nest near heavy cover such as brush and logs. The male guards the eggs and fry for about a month.

Did you know?

Largemouth bass have a sensor along their lateral line that picks up underwater vibrations as subtle as small fish swimming nearby. The eyes of largemouth bass absorb more light than human eyes. In shallow waters, largemouth bass can detect colors, especially red.

Longear Sunfish

Lepomis megalotis

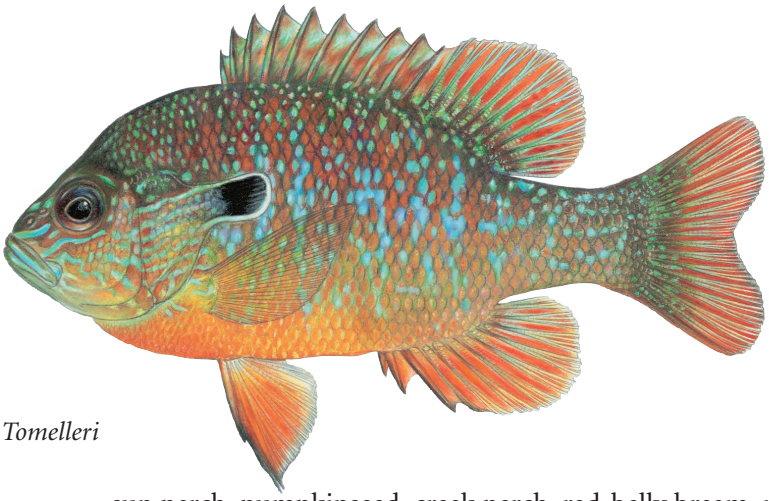


Illustration by Joseph Tomelleri

Common Names sun perch, pumpkinseed, creek perch, red-belly bream, red perch, blackear and red bream

Identifying Features Longear sunfish have a blue-green back and sides speckled with yellow and emerald with an orange and yellow belly. They are named for having a long earflap that is typically bordered with white. Emerald blue wavy lines run from the mouth to the earflap.

TYPICAL ADULT

Length Less than six inches

Weight Less than one pound

Life span Up to 4 years

Habitat Longear sunfish prefer shallow, weedy waters of lakes and ponds; also found in quiet streams. They are frequently found in the same streams as spotted bass.

Feeding Behavior Longear sunfish eat mainly aquatic insects, as well as mites, small crustaceans, fish eggs, mollusks, filamentous algae, and small fish.

Reproductive Behavior WHEN: Spring-to-summer
PREFERRED WATER TEMPERATURE: 75-80°F
HOW: The male prepares the nest, of pebbles, gravel and sand, in shallow waters along the shoreline using its fins to clear a circular depression and fan silt away. It then locates a female who lays sticky eggs in the nest. The male aggressively guards these eggs and within two weeks of hatching herds the larvae into dense schools to more safely search for food and mature.

Did you know?

Longear sunfish feed more extensively at the surface of the water than some other sunfish. They are well known to most young anglers as being the first "perch" they ever caught on a cane pole with a dangling worm for bait.

Muskellunge

Esox masquinogy

Illustration by Joseph Tomelleri

Common Names	muskie, lunge, maskinonge, great pike
Identifying Features	Musekllunge have a light green back and a pale belly. Their sides are marked with dark diamond-shapes.

TYPICAL ADULT

Length	Up to 52 inches (sometimes up to 60 inches)
Weight	Up to 46 pounds
Life span	30 or more years
Habitat	In the summer, muskellunge inhabit the deep water of ponds, lakes, streams, and slow-moving rivers. In the fall, they live in shallow weedy areas.
Feeding Behavior	Muskellunge are carnivores (meat eaters) and feed on fish, frogs, crayfish, and occasionally, young mice, muskrats, and ducklings.
Reproductive Behavior	WHEN: Mid to late spring PREFERRED WATER TEMPERATURE: 49-59°F HOW: Adults pair off at spawning. The female sometimes swims along shoreline with 1-2 smaller males nearby. The eggs are scattered at random over lake or river vegetation. Adults do not guard the nest.

Did you know?

Muskellunge have three distinct color phases: spotted, clear, and barred.

Northern Pike

Esox lucius

Illustration by Joseph Tomelleri

Common Names	great northern pike, jack, jackfish, pickerel, snake, gator
Identifying Features	Northern pike have light bars on an olive-green back. Their fins have dark spots with a reddish tinge.

TYPICAL ADULT

Length	Up to 39 inches
Weight	Up to 24 pounds (sometimes up to 40 pounds)
Life span	Up to 25 years
Habitat	Northern pike inhabit large, weedy bays of natural lakes in the northern U.S. and slow, meandering rivers with heavy weed growth. They can also be found in ponds, lakes, and streams. Northern pike live in shallow water in the summer and deep water in the winter. As the fish grow larger, they prefer colder water temperatures.
Feeding Behavior	Northern pike eat mostly fish, but also frogs, crayfish, mice, muskrats, and ducklings.
Reproductive Behavior	WHEN: Early spring, just after ice-out PREFERRED WATER TEMPERATURE: 40-70°F HOW: Eggs are scattered at random in small tributary streams, marshes adjacent to lakes, or shallow, weedy bays. Adults do not guard the eggs.

Did you know?

Female northern pike grow faster and live longer than males. The northern pike is one of two freshwater fish known to live on three continents: North America, Europe, and Asia.

Paddlefish

Polyodon spathula

Illustration by Joseph Tomelleri

Common Names	spoonbill, spoonbill cat, shovelnose cat, spadefish
Identifying features	Paddlefish are gray to dark blue with white sides and a white belly. They also have a long, paddle-shaped snout and a pointed gill cover that extends to the middle of the body.

TYPICAL ADULT

Length	Up to 68 inches
Weight	Up to 67 pounds (sometimes over 100 pounds)
Life span	Up to 30 years or more
Habitat	Paddlefish inhabit slow-moving stretches of large rivers and adjoining backwaters, especially where bottoms are muddy.
Feeding Behavior	Paddlefish swim with bills wide open, swaying slowly from side to side to feel for concentrations of plankton. They filter plankton with gill rakers (strainer-like teeth). Paddlefish also eat small crustaceans, algae, and mayflies.
Reproductive Behavior	WHEN: Spring PREFERRED WATER TEMPERATURE: 50-60°F HOW: As the water level rises, female paddlefish deposit eggs at random on silt-free gravel, either exposed to the air or barely submerged. Adults do not guard the eggs.

Did you know?

There are only two living species of paddlefish in the world—one in North America and the other in China. Paddlefish eggs are a delicacy and are often used to make caviar. They can grow to be 1 foot long in their first year.

Rio Grande Cutthroat Trout

Oncorhyncus clarki viginalis

Illustration by Joseph Tomelleri

Common Names	New Mexico cutthroat trout
Identifying Features	Rio Grande cutthroat trout have a yellowish-green to gray-brown body with scattered black spots. They have a densely spotted tail.

TYPICAL ADULT

Length	Up to 10 inches
Weight	Up to 1 pound
Life span	Up to 8 years
Habitat	Rio Grande cutthroat trout inhabit mountain streams and rivers.
Feeding Behavior	Rio Grande cutthroat trout feed on insects, zooplankton, and crustaceans.
Reproductive Behavior	WHEN: Spring or summer PREFERRED WATER TEMPERATURE: 48-52° F HOW: The female lays between 200 to 4,500 eggs on a gravel nest in flowing water where high levels of dissolved oxygen exist.

Did you know?

The Rio Grande cutthroat trout is the southernmost species of cutthroats. The introduction of the rainbow trout led a decline in the populations of Rio Grande cutthroat trout, combined with early logging, grazing, and hunting practices.

Spotted Bass

Micropterus punctulatus

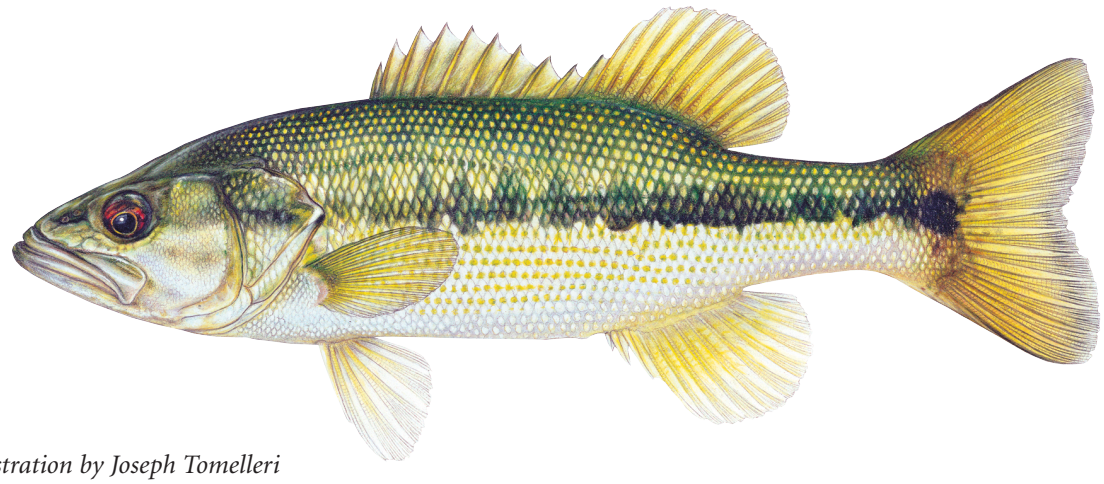


Illustration by Joseph Tomelleri

Common Names	Kentucky bass, spot, Alabama spotted bass
Identifying Features	Spotted bass have an olive green back with dark, diamond shaped blotches above a white belly

TYPICAL ADULT

Length	Up to 18 inches
Weight	Up to 3 pounds
Life span	Up to 7 years
Habitat	Spotted bass inhabit clear, slow-moving, small to medium-sized streams and deep reservoirs.
	Spotted bass feed on crayfish, small fish, and larval and adult insects.
Reproductive Behavior	WHEN: Spring REFERRED WATER TEMPERATURE: 63-68°F HOW: The male sweeps silt from the rock bottom near heavy cover, such as brush or logs, to make a nest. After the female lays eggs on the nest, the male fertilizes them and guards the eggs and the fry (young) for about a month.

Did you know?

Spotted bass become lighter in color when the water becomes murkier. They are seldom found in natural lakes. A spotted bass subspecies known as the "Wichita spotted bass" is thought to be extinct.

Steelhead Trout

Oncorhynchus mykiss irideus

Illustration by Joseph Tomelleri

Common Names	coastal rainbow trout, steelies
Identifying Features	Steelhead trout have a glowing steel-blue body with spots on the upper body. Their tail has radiating rows of black spots.

TYPICAL ADULT

Length	Up to 34 inches
Weight	Up to 8 pounds (may reach 24 pounds)
Life span	Up to 11 years
Habitat	Steelhead trout are anadromous fish, which means they inhabit the Pacific Ocean and Great Lakes area except during spawning season, when they move to rivers and streams.
Feeding Behavior	Steelhead trout feed on immature and adult insects, plankton, crustaceans, fish eggs, and small fish.
Reproductive Behavior	WHEN: Spring PREFERRED TEMPERATURE: 50-60°F WHERE: Steelhead trout spawn in large, swift, boulder-filled streams at the gravelly tail of a pool or a riffle at the head of a pool. HOW: The female digs several nest-like depressions called "redds" and deposits eggs in each one. The adults do not guard the eggs.

Did you know?

A steelhead tagged in the Aleutian Islands was caught six months later in Washington, 2,400 miles from the tagging site.

Striped Bass

Morone saxatilis

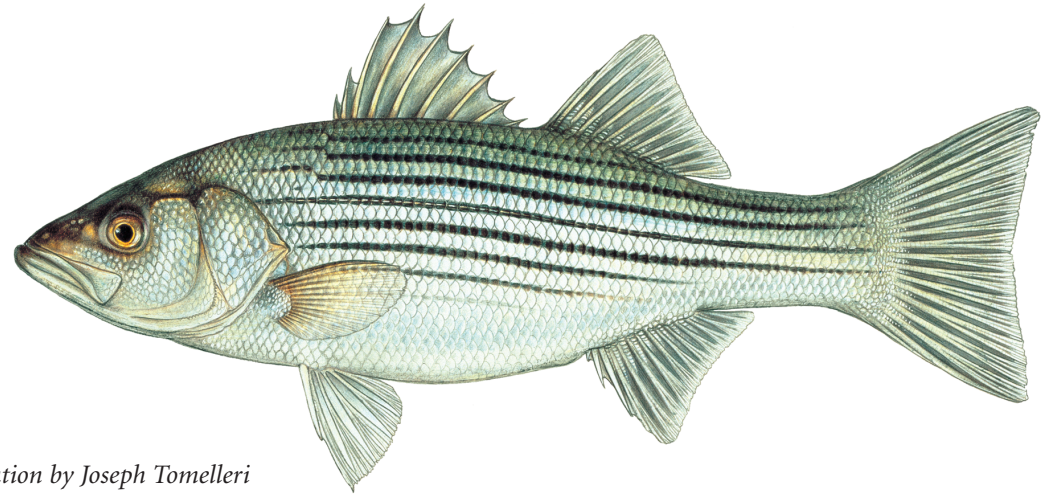


Illustration by Joseph Tomelleri

Common Names	striper, rockfish, linesides
Identifying Features	Striped bass have a dark, olive-green to bluish-black back and silvery-white sides and belly. There are 7 to 8 black, unbroken, horizontal stripes along the side.

TYPICAL ADULT

Length	Up to 35 inches (sometimes up to 48 inches)
Weight	Up to 37 pounds (sometimes up to 100 pounds)
Life span	Up to 9 years
Habitat	Striped bass are an anadromous species of fish, inhabiting both fresh water and salt water, depending on the time of year. Striped bass live in the Atlantic and Pacific coastal waters and the Gulf of Mexico but enter freshwater streams to spawn.
Feeding Behavior	Striped bass feed on threadfin, gizzard shad, crustaceans, insects, and bottom organisms. The heaviest feeding times are at dawn and dusk.
Reproductive Behavior	WHEN: Spring PREFERRED WATER TEMPERATURE: 55-60°F HOW: Adults swim up tributary streams and spawn below dams or natural obstructions such as rock formations. The female deposits eggs in light to moderate current. The moving water keeps the eggs afloat until they hatch. Adults do not guard the eggs.

Did you know?

Striped bass move in packs or schools to feed, with all the members tending to feed at the same time. Up to 50 striped bass may spawn together.

Tarpon

Megalops atlanticus

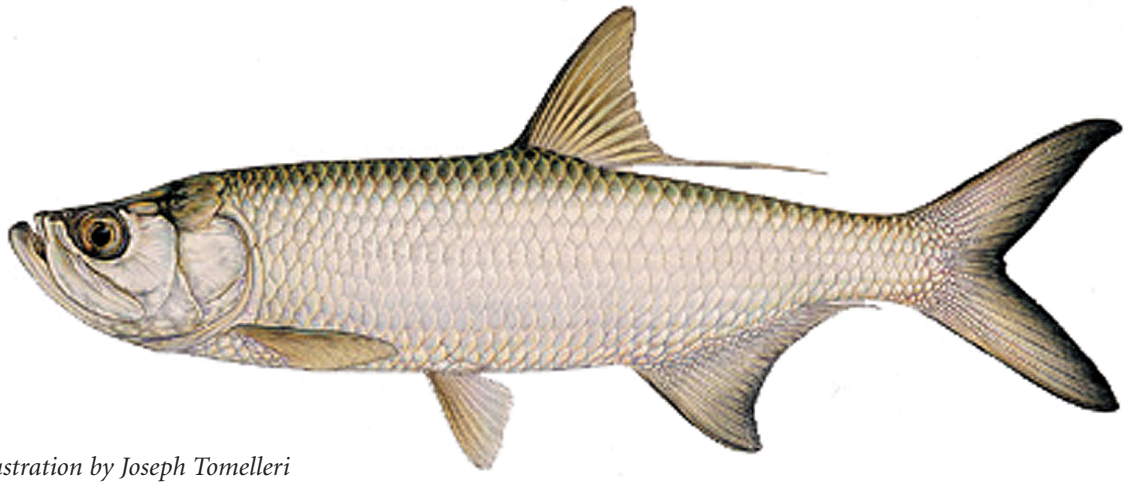


Illustration by Joseph Tomelleri

Common Names	silver king, silverfish, tarpum
Identifying Features	Tarpon have a narrow band of dark blue-green on their back and a single dorsal fin with an elongated ray. They also have a prominent upturned lower jaw and silver sides with large scales.

TYPICAL ADULT

Length	Up to 96 inches
Weight	Up to 80 pounds
Life span	Up to 16 years
Habitat	Tarpon inhabit shallow, warm Atlantic and Gulf coastal waters and estuaries (water where a river meets the sea), including lagoons, mangrove swamps, and rivers.
Feeding Behavior	Tarpon feed on sardines, anchovies, and crustaceans.
Reproductive Behavior	WHEN: Spring or summer PREFERRED WATER TEMPERATURE: 72-82°F HOW: Along the ocean floor, the female tarpon lays more than 12 million eggs.

Did you know?

Adult tarpon swallow their food whole. Tarpon need to swallow air and are often seen "rolling" on the surface gulping for air.

Walleye

Stizostedion vitreum vitreum

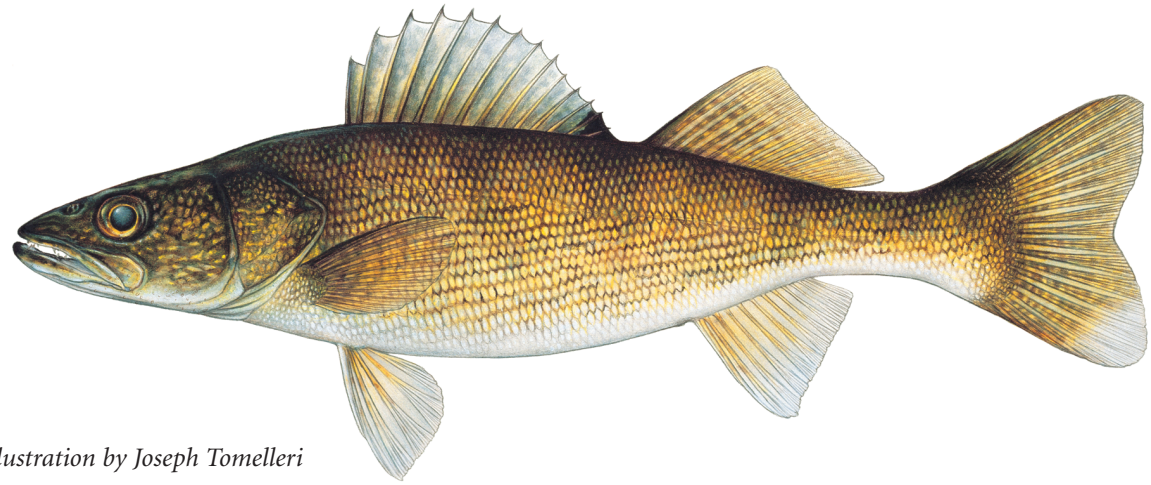


Illustration by Joseph Tomelleri

Common Names	walleyed pike, pickerel, jackfish, dorè
Identifying Features	Walleye have a milky cast to their eyes. They have a long, round, olive body that has gold flecks on the sides with a white tip to the lower fork of the tail. There is a distinct black blotch on the rear end of the first dorsal fin.

TYPICAL ADULT

Length	Up to 30 inches
Weight	Up to 10 pounds
Life span	Up to 26 years
Habitat	Walleye are most numerous in large, cool, windswept lakes with low to moderate clarity. They also live in large rivers.
Feeding Behavior	Walleye most prefer other fish, but also eat aquatic insects, leeches, crayfish, snails, and larval salamanders. They normally feed in dim light.
Reproductive Behavior	WHEN: Spring PREFERRED WATER TEMPERATURE: 45-50° F HOW: No nests are built. The female scatters eggs randomly along a shallow, windswept shoreline with rubble bottom. Adults do not guard the eggs or fry (young).

Did you know?

Walleye are named for their prominent, milky eyes. Blue walleye were once common in Lake Erie and Lake Ontario but are now thought to be extinct.

Weakfish

Cynoscion regalis

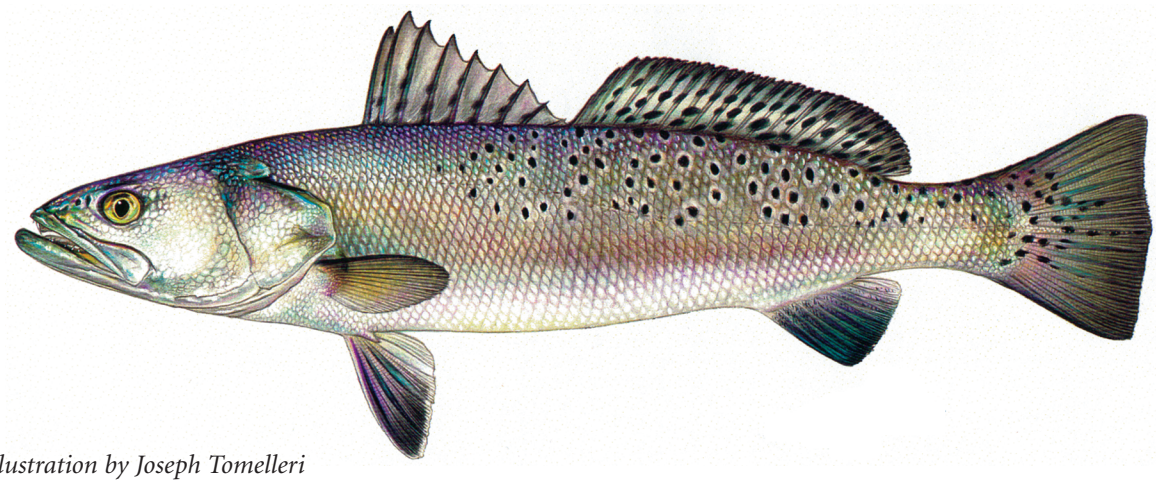


Illustration by Joseph Tomelleri

Common Names	tide runner, sea trout, yellow fin trout, yellow mouth, squeteague, gray trout, gray weakfish
Identifying Features	Weakfish have a projecting lower jaw with a soft mouth. They have an olive-green back with dark spots above copper sides. Their fins have a yellow tinge.

TYPICAL ADULT

Length	Up to 36 inches
Weight	Up to 18 pounds
Life span	Up to 12 years
Habitat	While not spawning, weakfish live in sandy, shallow waters of the temperate seas off the North Atlantic coast, especially around the mid-Atlantic states.
Feeding Behavior	Weakfish eat other fish and crustaceans, especially crab and shrimp.
Reproductive Behavior	WHEN: Spring or summer PREFERRED WATER TEMPERATURE: 56-68° F HOW: During spawning season, weakfish migrate north and inshore, entering sounds, bays, and estuaries (water where a river meets the sea). The male makes a croaking or drumming sound to attract females. The female broadcasts eggs randomly. The eggs hatch within 48 hours.

Did you know?

Weakfish have a delicate mouth structure. Often, hooks from fishing poles will pull out their jaws. This is how weakfish got their name.

White Bass

Morone chrysops

Illustration by Joseph Tomelleri

Common Names	silver bass, striper, sand bass, whitey, dwarf striper
Identifying Features	White bass have a blue-gray back with silver sides that have about 5 to 7 bold, horizontal stripes above the lateral line. White bass have separated dorsal fins and a protruding lower jaw.

TYPICAL ADULT

Length	Up to 15 inches
Weight	Up to 3 pounds
Life span	Up to 6 years
Habitat	White bass inhabit large lakes connected to major river systems or big rivers with moderate current and are found throughout the Midwest, including the Great Lakes and St. Lawrence River, as well as some southern and southwestern states down to the Gulf of Mexico. The preferred water temperature is 65-75°F.
Feeding Behavior	White bass prefer shad and emerald shiners but will eat any fish available, as well as insect larvae and crayfish. Their heaviest feeding times are at dawn and dusk.
Reproductive Behavior	WHEN: Spring PREFERRED WATER TEMPERATURE: 58-64°F HOW: The white bass swim upstream in rivers or shoal lakes to a barrier, such as a dam, and drop eggs in light current, over weeds, debris, and rock. The adults abandon the eggs. Up to a million eggs are spawned.

Did you know?

The white bass is one of only three members of the bass family found in Oklahoma.

White Crappie

Pomoxis annularis

Illustration by Joseph Tomelleri

Common Names	papermouth, speckled perch, bachelor perch, silver bass, calico bass
Identifying Features	White crappies have an iridescent, olive-green back with spots arranged in 7-9 vertical bars. Their sides are silvery with emerald and purple reflections.

TYPICAL ADULT

Length	Up to 15 inches
Weight	Up to 2 pounds (sometimes up to 5 pounds)
Life span	Up to 8 years
Habitat	White crappies inhabit natural and man-made lakes and slow-moving, silt-laden rivers, as well as weedy ponds and lakes.
Feeding Behavior	White crappies feed on suspended plankton (passively floating, minute animal and plant life), small fish, fish eggs, and larval aquatic insects.
Reproductive Behavior	WHEN: Spring PREFERRED WATER TEMPERATURE: 62-65°F HOW: White crappies nest in colonies. The male guards the nest and fry (young).

Did you know?

White crappies can survive in very warm water temperatures, sometimes approaching 85°F.

Wildlife Forever®
State-Fish Art™ Contest
RULES & REGULATIONS

The Wildlife Forever State-Fish Art Contest is open to children in grades four through twelve attending public, private, or home-schools worldwide.

International students are encouraged to participate. Choose an official U.S.A. state fish and you will be entered in that state's contest. (visit www.statefishart.com/states for the authorized list)

Only one entry per child per year will be accepted.

Completed portfolios include both artwork and a composition/essay as follows:

ARTWORK ~

- The artwork must call attention to any officially designated state-fish. Information on each state-fish is available at Your State Fish.
- The fish must be depicted in its natural habitat.
- Portfolios will be judged on the quality of the artwork.
- The artwork must be the contestant's original, hand-done creation. Photographs and computer-generated artwork will not be accepted.
- The artwork must be HORIZONTAL, 8.5" x 11" without a mat, frame, cover sheet, or border.
- The artwork must not exceed 1/4 inch in total thickness.
- Art techniques may include scratch-board, pointillism, chalk, charcoal, dry brush, watercolor, crosshatch, lead, collage, linoleum printing, or crayon. (Please note: if contestants use chalk or lead they should seal it with an adhesive).
- No lettering, signatures, or initials may appear on the front of the design. Any artwork with such identifying characteristics will be disqualified and eliminated from the competition.

COMPOSITION/ESSAY ~

- The composition or theme paper is not to exceed one page in length.
- The composition should be related specifically to the characteristics of the state fish, its habitat, behavior, or efforts to conserve it.
- The composition **must** include the student's name and address.

THE ART OF CONSERVATION® STAMP AWARD

Each year Wildlife Forever will select one design from all the entries for an interesting, colorful and attractive national fish stamp.

Criteria for selection of the award follows:

- All rules, regulations and deadlines of the State-Fish Art Contest apply.
- The state fish should be the dominant feature of the design.
- The habitat must be appropriate to your chosen state and species.
- Designs may include fishing related items.
- Keep the design simple. The image will be reduced to create a stamp.
- Color will be given priority over black and white.
- Do not make the design look like a stamp. No numbers or design elements are allowed.

THE ART OF CONSERVATION®

GENERAL ~

Entries must be postmarked no later than March 31st

Three winners from each state will be selected on May 1, one winner per grade group (4-6th, 7-9th, 10-12th) for a total of 150 winners (50 states x 3 winners = 150).

All contestants will receive a certificate of participation.

All winning designs will be displayed at the State-Fish Art Expo during the following summer..

All winning designs will be presented online at http://www.statefishart.com/

Visit Prizes to catch the latest information about prizes for the Wildlife Forever State-Fish Art Contest!

Wildlife Forever has developed, **Fish On!**, a comprehensive, interdisciplinary lesson plan to enhance the State-Fish Art Contest. Learn more by visiting the Educators' Corner.

Educators should assume responsibility for making ethics part of the overall contest. There is no room for plagiarism in artwork or composition content. Copyright laws apply.

Teachers, please complete the "Teacher/School" information **before photocopying and distributing** the entry form to your students.

Please type or print clearly as you complete the entry form.

ENTRY FORM ON CD
& STATE-FISH ART WEBSITE

THE FINE PRINT ~

The State-Fish Art Contest is not open to the immediate relatives of Wildlife Forever employees or participating sponsors.

It is the students responsibility to inform Wildlife Forever of any change of address.

Wildlife Forever:

- has the right to use the name of any State-Fish Art contestant without compensation.
- retains ownership of all artwork entered in the contest.
- will keep the winning entries one year for promotional and display purposes.
- upon request, will return all non-winning entries after August 31 (if the student provides a self-addressed, post paid, 10"x13" envelope).
- reserves the right to destroy unclaimed entries after one year.
- will not insure entries it receives or be responsible for loss or damage of the entries.

The winning artists must provide autographs without charge to Wildlife Forever.

In order to promote the Wildlife Forever State-Fish Art Contest, products such as posters, prints, T-shirts, etc. may be produced from winning artwork.

Any monies realized from the sale or licensing of the artwork will be used to support the contest, wildlife conservation, and education initiatives.

For Wildlife Forever Use Only

Wildlife Forever®
State-Fish Art™ Contest
ENTRY FORM

ENTRY DEADLINE ~ postmarked by **MARCH 31** annually

Address to ~ WIldlife Forever
2700 Freeway Blvd. - # 1000
Brooklyn Center, MN 55430

TEACHERS: If this is part of a classroom project, please fill out your teacher and school information before duplicating and distributing to students.

GRADE *(check one)*

- ☐ 4th
- ☐ 5th — GROUP 1
- ☐ 6th
- ☐ 7th
- ☐ 8th — GROUP 2
- ☐ 9th
- ☐ 10th
- ☐ 11th — GROUP 3
- ☐ 12th

PLEASE PRINT OR TYPE

Portfolio Check List:

- ☐ Artwork must be HORIZONTAL, 8.5"x11" and no more than ¼" thick.
- ☐ Do not mat, frame or have lettering or borders on the front
- ☐ Glue this entry form to back of artwork . . . DO NOT STAPLE!
- ☐ Composition/essay no more than one page in length

ART ENTRY TITLE _____

COMPOSITION TITLE _____

FISH SPECIES _____

OFFICIAL STATE-FISH OF WHICH STATE? _____

MEDIUM USED _____

Contestant _____
Last Name First Name Date of Birth

Home Address _____
Street or PO Box

_____
City State Zip

Telephone ( ) _____ ( ) _____
Home Parent Daytime

Email _____

Contestant's Teacher _____ ( )
Last Name First Name School Phone

Teacher Email _____

School Address _____
School Name (Full)

_____
Street or PO Box

_____
City State Zip

I hereby certify that this is my original work and is not a copy of published photographs, magazines, book illustrations, or any other materials protected by copyright laws. I understand that Wildlife Forever and other sponsors are not responsible for loss or damage to my artwork and/or composition. I grant exclusive right to Wildlife Forever and its designees to utilize my artwork and/or composition for reproduction and promotional purposes and to display my art; also, I agree that my artwork and/or composition may be used, altered, or published as they see fit without compensation to me.

Signature of Student _____ **DATE** _____

Signature of Parent Guardian or Teacher _____ **DATE** _____

ENTRY QUESTIONS? email info@wildlifeforever.org or call 1.763.253.0222

Visit www.statefishart.com for contest updates and changes.

THE ART OF CONSERVATION®

What People are Saying...

Several big success stories involve the arts with conservation. As a past judge of the State-Fish Art Contest, the students learn about fish and fishing and the best part is the art is amazing!

~ Joseph Hautman, Wildlife Artist, Federal Duck Stamp winner 1992, 2002, 2008

I just can't thank you enough for all you've done to encourage and inspire me. This year is one that I'm sure to never forget!

~ Brie Jenkins, Grade 10-12 Missouri 2009 Art of Conservation Award & People's Choice Award winner

I always look forward to seeing the families at the Expo!! It is especially rewarding to see how proud the artists are when they come up to accept their award! It shows me we are making a difference and inspiring future stewards!!

~ Scott M. Grieve, Chairman of the Board, Wildlife Forever

Thank you for providing such a wonderful opportunity for my science and art students to learn about their state fish! ~ Kathleen Chapman, Toltec Elementary School, Eloy, AZ

Contest Aims To Inspire Creativity and Conservation

~ *BASS Master Magazine*

As always, I'll be looking forward to seeing the kid's excellent work again next year. Please tell every one of them to 'draw one for me'.

~ Bill Dance, Television Personality, *Bill Dance Outdoors*

It was such a pleasure for me to be one of the judges … the Art Institutes International will be very proud to offer scholarships to the winners. They seem to be very young but so talented.

~ Jelena Tosovic, Academic Director Graphic Design, Ai Minnesota

Wow!

A great way to merge art with ichthyology and teach students to have fun while learning about their state fish's behavior and habitat requirements.

~ R. Max Peterson, Chief U.S. Forest Service (Retired)

It takes the outdoors into the class room, teaches life skills and conservation…what's not to love about the State Fish Art Contest!

~ Steve Pennaz, Executive Director, North American Fishing Club

Special Thank You to our ...

Advisors ~

Leah Anderson - USDA Forest Service, Eastern Region
Dawn D. Cook - Arkansas Game and Fish Commission
Francine MacDonald - Ontario Federation of Anglers and Hunters
Daryl Pridgen - USDA Forest Service, Eastern Region
Nick Schmal PhD - U.S. Forest Service, Eastern Regional Office
Zoe Ann Stinchcomb - Texas Freshwater Fisheries Center

Fish Illustrator ~

Joseph Tomelleri

Cover Artists ~ *(from Left to Right)*

2009 Alaska winner - Grades 4-6 (chinook salmon)
2009 New Jersey winner - Grades 7-9 (brook trout)
2001 California winner - Grades 4-6 (golden trout)

National Spokesmen & Honorary Chairmen~

Bill Dance - *Bill Dance Outdoors*
Bud Grant - NFL Hall of Fame Coach (retired), Minnesota Vikings
Steve Pennaz -North American Fishing Club
Ron Schara - *Backroads with Ron and Raven, Call of the Wild, Minnesota Bound*
Babe Winkelman - *Babe WInkelman's Outdoor Secrets*

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North American Fishing Club
Pemmican
Rapala
Texas Freshwater Fisheries Center
The Art Institutes International
U.S. Fish & Wildlife Service
U.S. Forest Service

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