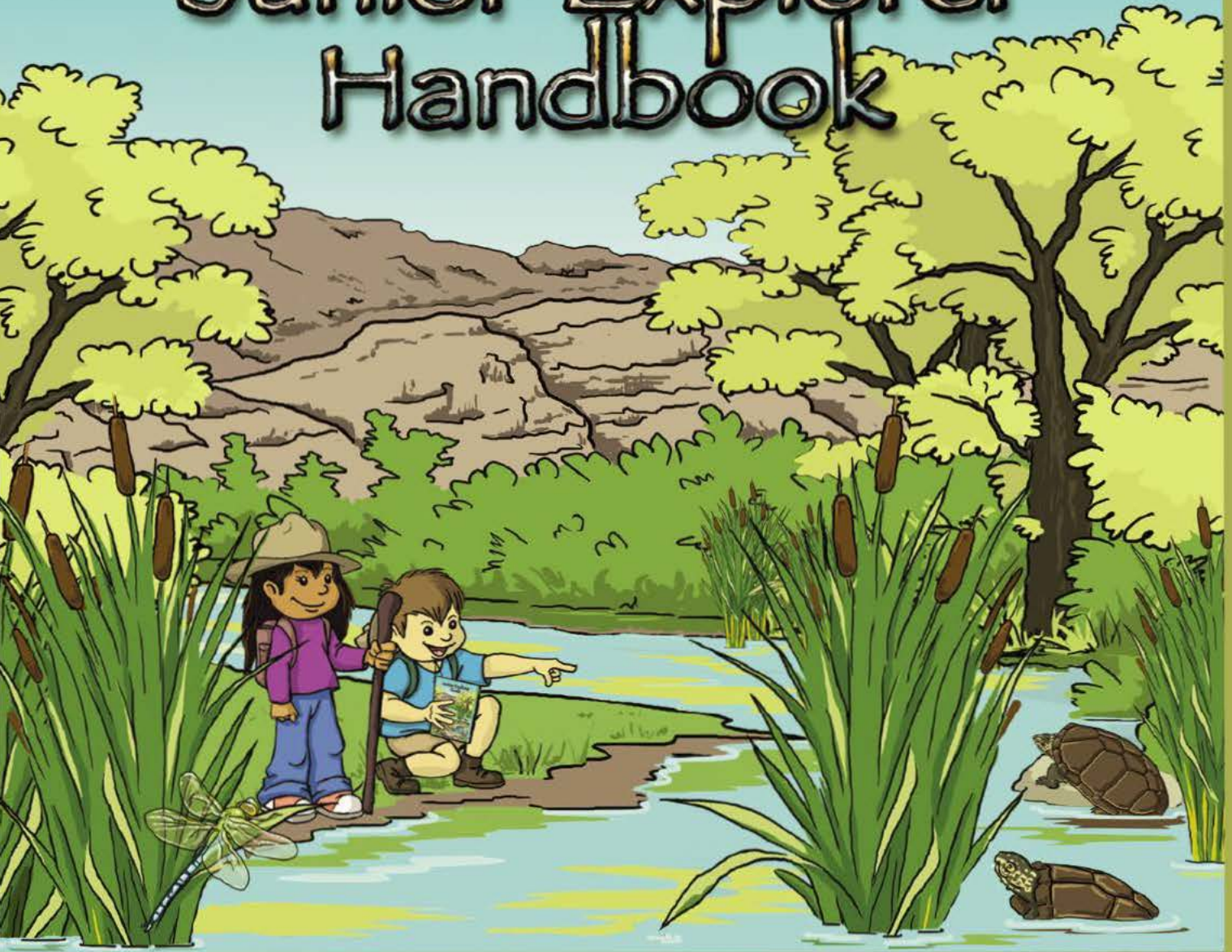


# Junior Explorer Handbook



Arizona • Gila District

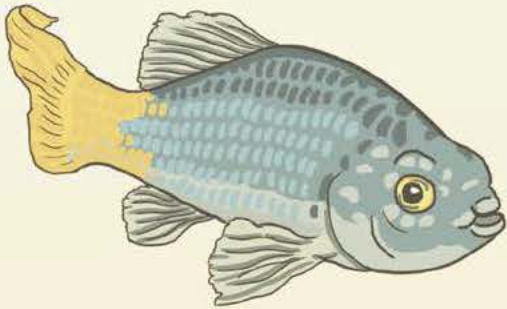


## Desert Fishes

### Activity Guide

# Hi Kids!

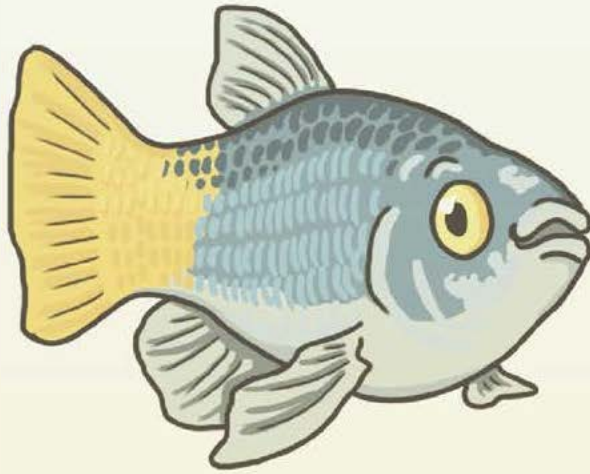
My name is Diego and I'm a desert pupfish



Desert pupfish like me are pretty small, only about 2 inches long and we can have different colors. When young, we are silvery with narrow, up-and-down dark bands on our sides. In the spring, when water temperatures warm, males like me become iridescent blue. Our tail fin and the narrow part just in front of the tail fin (I call these my caudal fin and caudal peduncle) become yellow! Come with me as we explore aquatic habitats and learn about desert fishes.

## Habitats and Fish

Where my friends and I live is called our habitat. A fish's habitat must contain water, food, shelter (cover), and space. Fish not only live in water, but we get oxygen from water as well. Fish breathe by taking water into their mouths and forcing it out through their gills. We eat different types of food depending on our age. Young fish eat greens like plankton and algae, while adult fish eat larger food items such as aquatic insects or even small fish. Fish also require cover to hide from predators and to reproduce. Native fish use undercut banks, rocks, woody debris, and aquatic plants as cover.



Hey kids,  
did you know  
public lands  
belong to you?

### *Public Lands Belong to You*

The aquatic habitats that we will explore are managed by the Bureau of Land Management (BLM). The BLM is a federal government agency that takes care of more than 245 million acres of public lands. That's HUGE! Most of these lands are in the western part of the United States. Public lands are managed for multiple uses. Did you know that one of the principle uses of public lands is the management of habitats to provide food and shelter for me and my friends? Some public lands have been identified for special management. These lands fall within the BLM National Landscape Conservation System (NLCS) and are called National Conservation Lands. National Conservation Lands are managed to conserve, protect, and enhance these nationally significant landscapes that are recognized for their outstanding cultural, ecological, and scientific values. All public lands are managed for the American public.

### *Junior Explorers*

The BLM's Junior Explorer program helps young explorers like you learn about the lands and resources managed by the BLM. This handbook will introduce you to desert fishes and their aquatic habitats located on BLM-managed lands in southeastern Arizona.

### *How to earn your badge*

You can complete the activities on your own or invite a parent or an adult you know to join you. When you are finished, you can check your answers online at [http://web.blm.gov/wo-170/wo-172/wo172\\_interp/resources/junior\\_explorer.html](http://web.blm.gov/wo-170/wo-172/wo172_interp/resources/junior_explorer.html). After you know that your answers are correct, read the Junior Explorer Pledge on page 28, and sign and date your certificate. Badges can be obtained by emailing SFOWEB\_AZ@blm.gov or by contacting the following office by mail or in person:

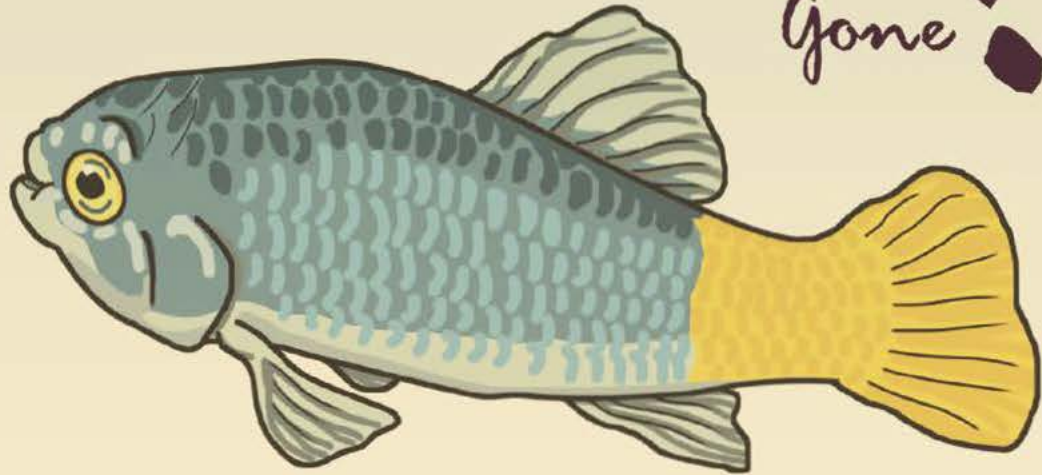
BLM Safford Field Office  
711 South 14th Avenue  
Safford, AZ 85546

Have fun learning and exploring!

Where Have All My

# Native Friends?

Gone!



All my desert fish friends in the Southwest are in trouble and need your help. There was a time when 36 different types of native fishes lived in Arizona. Today there are only 35. One fish, the Monkey Spring pupfish, is already gone forever (a word for that is “extinct”) and many of my other friends are threatened or endangered. An animal listed as threatened, might become endangered. Desert pupfish, like me, and many other desert fishes in Arizona are endangered. Endangered animals or plants are so rare they are in danger of becoming extinct.

Native desert fishes are decreasing throughout the Southwest. This is because fish not from around here (nonnatives) eat us, compete with us for food and habitat, or our aquatic habitats get changed or taken away.

Throughout this book, you will learn how the BLM and its partners are working together to ensure our survival. The BLM conserves native desert fish by protecting, restoring, and enhancing their habitats in cooperation with other federal resource agencies, state and tribal fish and wildlife agencies, engaged individuals, and groups like the Desert Fishes Council and Desert Fish Habitat Partnership. You will also learn how you can help protect me, my desert fish friends, and our habitats. So please come with me as we travel across southeastern Arizona to explore aquatic habitats and learn about desert fishes so that you can become an official Junior Explorer.

# Let's **Explore** Some Special Places!

## **Gila Box Riparian National Conservation Area**

This unique area supports rare and valuable riparian habitats. Did you know that a “box” canyon is a small ravine or canyon with steep walls on three sides? The Gila Box includes four perennial waterways – the Gila and San Francisco rivers and Eagle and Bonita creeks - that provide a ribbon of green flowing through the desert. Of the four waterways, Bonita Creek still supports an intact native fish community. My friends living here include the Gila chub, longfin dace, speckled dace, Sonora sucker, desert sucker, Gila topminnow, and desert pupfish.

## **Aravaipa Canyon Wilderness**

Aravaipa Creek flows year-round through the Aravaipa Canyon Wilderness, a deep canyon with walls sometimes rising over 1,000 feet. I call it the “crown jewel” of desert streams in Arizona due to its incredible and irreplaceable value to native fish.

## **Muleshoe Ranch Cooperative Management Area**

Seven permanently flowing streams and the Redfield Canyon Wilderness are located within the Muleshoe Ranch Cooperative Management Area (CMA). Redfield Canyon is a narrow, red-walled canyon strewn with boulders and pools. Nine of my native fish friends can be found here and include Gila chub, speckled dace, longfin dace, spikedace, loach minnow, Sonora sucker, desert sucker, Gila topminnow, and desert pupfish.

## **Cold Spring Seep Ponds**

The BLM created Cold Spring Seep Ponds to provide aquatic habitat for Gila topminnow and desert pupfish. The creation of new aquatic habitat for desert fishes is necessary as the majority of our habitat has been lost or modified. The ponds also provide habitat for a tiny snail called the Bylas springsnail.

## **Las Cienegas National Conservation Area**

Las Cienegas contains five of the rarest habitat types in the American Southwest: ciénega, cottonwood-willow riparian forests, sacaton grasslands, mesquite bosques, and semi-desert grasslands. The ciénega is home to Gila topminnow, Gila chub, and longfin dace.

## **San Pedro Riparian National Conservation Area**

The San Pedro Riparian National Conservation Area includes the upper 40 miles of San Pedro River. This is the last free-flowing river, meaning it is not dammed, in the American Southwest. It is home to birds, mammals, reptiles and amphibians. Historically, the San Pedro River was home to 14 species of native fish. Today, most have been replaced by nonnative species such as the common carp, black bullhead, and mosquito fish. Only the longfin dace and desert sucker remain from the original San Pedro populations.

Keep reading to learn more about each of these unique and interesting aquatic habitats and the fish that call these places home.



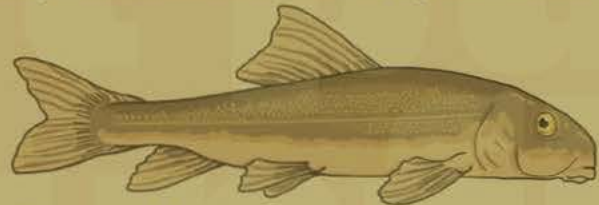
# Desert pupfish, like me, are native to Arizona.

Our natural home is in a variety of different habitats like ciénegas, springs, creeks, streams, and rivers. Ciénegas are wet marshy areas at the edge of grasslands where groundwater bubbles to the surface. Springs are places where groundwater sprays or seeps out naturally on the Earth's surface because of gravity or pressure. Creeks, streams, and rivers are areas where water flows in a natural channel. Creeks are the smallest of the three and rivers are usually the largest.

Help me and my friends find habitat where we can live. Look at the descriptions below and try to match the fish to its preferred habitat on the opposite page.

## 1. Some fish prefer deep, quiet pools with shade and cover.

My friend, the Sonora sucker, prefers pool habitats over sandy, gravelly bottoms. When feeding, they swim along the bottom and use their mouths to dislodge food materials such as aquatic insects, algae, and plant debris. This matches habitat \_\_\_\_.



## 2. Some fish prefer shallow, swift flowing water with gravel bottoms.

Speckled dace and loach minnow prefer areas of the stream that are shallow, with flowing water and gravel and cobble bottoms. This matches habitat \_\_\_\_.



## 3. Some fish are secretive and like places where they can hide.

Aquatic plants, rocks, fallen logs, and undercut banks provide places for me and my friends to hide from predators and places to rest. Many desert fishes, including Gila chub and desert pupfish, like to stay hidden to avoid other animals that would like to eat them. This matches habitat \_\_\_\_.



## 4. Some aquatic animals prefer shallow, slow flowing water with gravel and pebble bottoms.

A really small aquatic friend is the Bylas springsnails. Due to their size they can live in really small habitats with or without flowing water. This matches habitat \_\_\_\_.





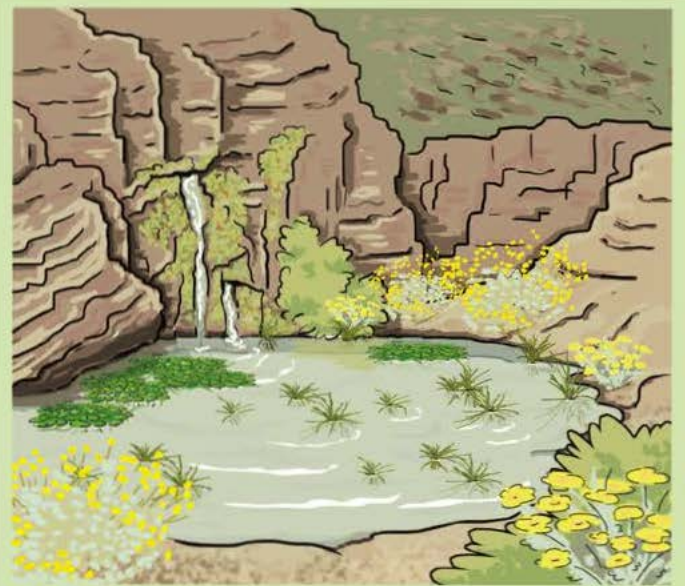
1. Some fish are secretive and like places where they can hide.



2. Some fish prefer shallow, swift-flowing water with gravel bottoms.



3. Some fish prefer deep, quiet pools with shade and cover.



4. Some aquatic animals prefer shallow, slow flowing water with gravel and pebble bottoms.

# Diego had to navigate many threats to reach Cold Spring Seep Ponds, a safe aquatic habitat for desert pupfish and Gila topminnow. Let's learn why these things threaten desert fish survival.



## *Water Removal*

Water is a limited resource in Arizona and throughout our southwestern deserts. Water is frequently pumped out of streams, rivers, and lakes to provide water for crops, livestock, and people. If too much water is pumped out, the water source can dry up and leave me and other aquatic wildlife without enough water to live in.



## *Trash/Pollution*

Discarded trash and other forms of pollution, like chemical waste, that get into aquatic habitats can be harmful because it can kill fish or the foods we eat. Plastic is extremely dangerous as fish can accidentally eat it or get tangled up in it.



## *Irresponsible Recreation*

Some of my friends use rocks for cover and often lay their eggs on the underside of rocks. Driving vehicles through streams can be very harmful as eggs and fish can be crushed and aquatic habitat destroyed.



## *Livestock*

Livestock trampling and grazing in riparian or aquatic habitats is another threat to me and my friends. Grazing along the stream can remove vegetation that protects the banks and provides cover.



## *Nonnative Species*

Every animal and plant species has a native habitat where it naturally lives and grows. When species are moved to a new area, either by accident or on purpose, they can harm the native species and their habitat. Nonnative fish not only eat the same type of food as the natives, they also eat us!

## *Fishing*

Many states have laws that protect native fish. It's important to understand the laws in your state. Help protect me and my friends by reporting violations. Also, remember to fish responsibly, and leave no trace. Properly dispose of all fishing supplies, including nets, hooks, or fishing line. Fishing line can cause harm to me and my friends and other wildlife if we get tangled in it.

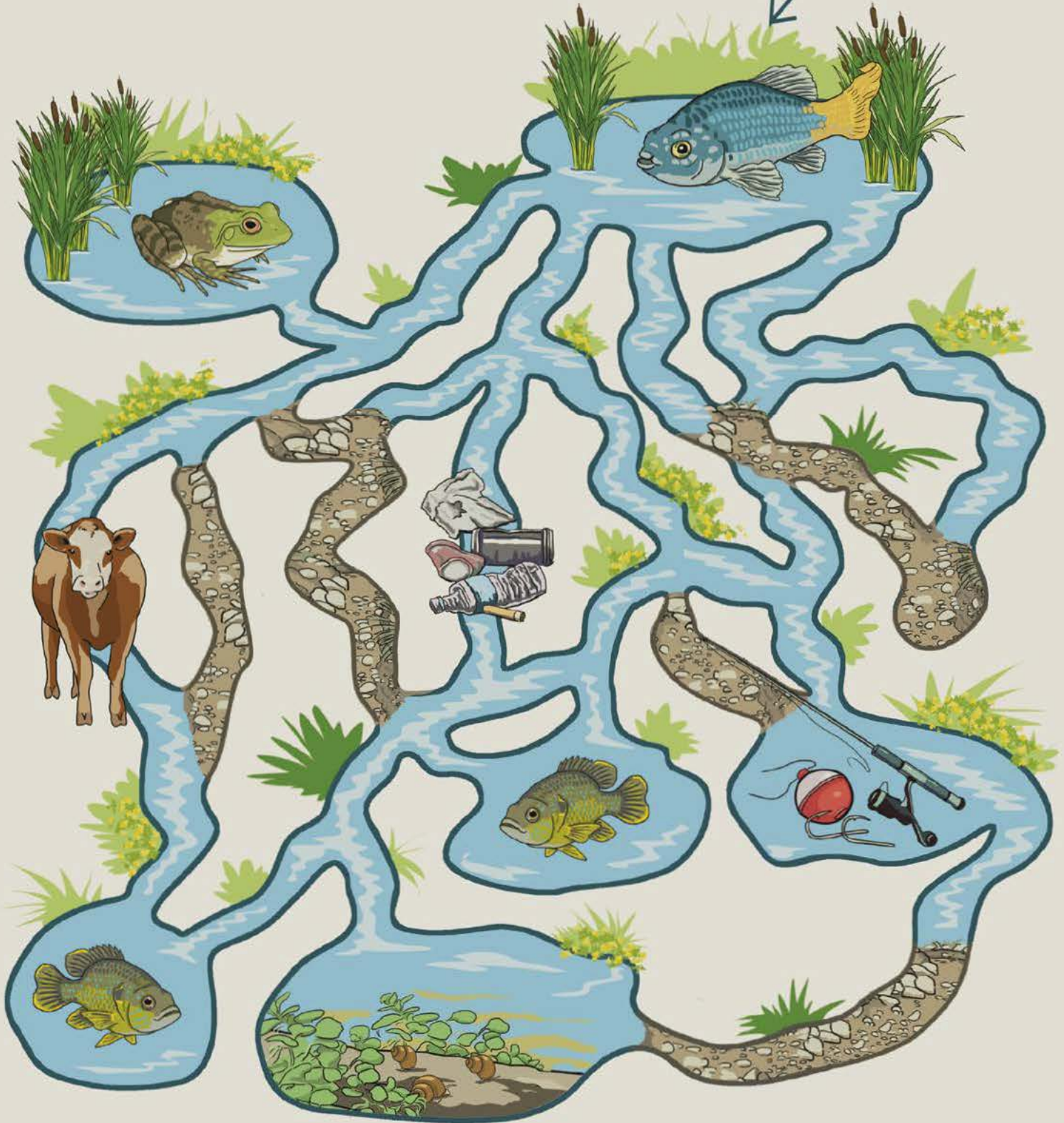




# Aquatic Habitat Threats

# MAZE

Let's go to Cold Spring Seep Ponds! As you are learning, nonnative species, livestock, and pollution threaten our survival. Please help me get through the maze to visit Cold Spring Seep Ponds without running into any of the threats that harm aquatic habitats.

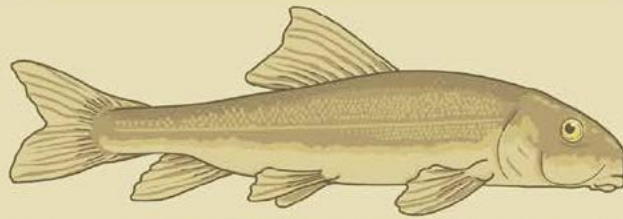


# WHAT DO I EAT?

Now let's visit the **GILA BOX RIPARIAN NATIONAL CONSERVATION AREA.**

The size, shape, and position of a fish's mouth determine what they eat and how they feed.

(1) Bottom-feeding fish, like the Sonora sucker, typically have what we call an "inferior" mouth. This doesn't mean it's not a good mouth! Inferior is just another word for being underneath. Fish with inferior mouths usually eat both plant materials and aquatic insects. Some bottom feeders like the Sonora sucker also have a fleshy mouth that acts like a vacuum to suck up food.



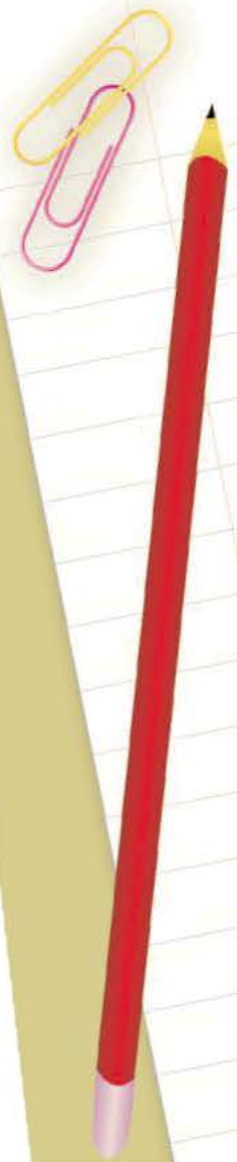
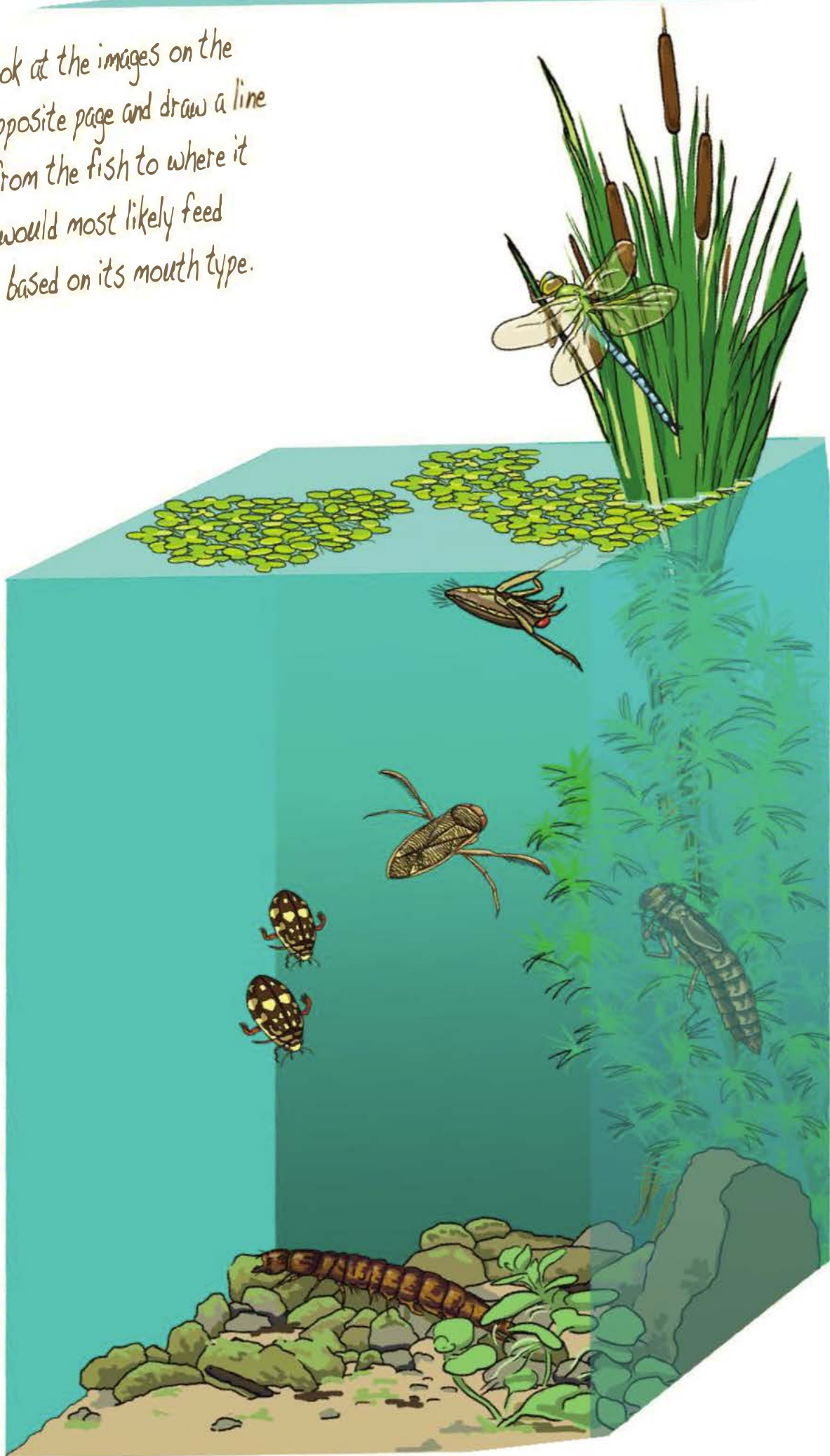
(2) Fish that feed in mid-water and eat other fish have what's called a "terminal" mouth. The Gila chub has a terminal mouth. Fish with terminal mouths usually eat insects or other smaller fish.



(3) Fish that feed on or near the surface usually have what's called a "superior" (upturned) mouth. The Gila topminnow has a superior mouth. Fish with superior mouths primarily feed on food that floats or is near the water surface like insects.



Look at the images on the opposite page and draw a line from the fish to where it would most likely feed based on its mouth type.



# Native Fish Gallery



*Desert pupfish* (*Cyprinodon macularius*)

Despite their tiny size, these hardy fish can survive in water over 100 degrees Fahrenheit and three times saltier than sea water.



*Gila topminnow* (*Poeciliopsis occidentalis*)

Give birth to live young. Gila topminnow is the only native fish in Arizona to bear live young.



*Desert sucker* (*Pantosteus clarkii*)

A specialized mouth allows this benthic (bottom-dwelling) omnivore to scrape algae and other food items from rocks.



*Sonora sucker* (*Catostomus insignis*)

Eats seeds from cottonwood trees that fall in the water. They lift their heads out of the water to "suck" at floating seeds that accumulate behind obstructions in the water.



*Roundtail chub* (*Gila robusta*)

Omnivore that eats whatever natural food is available to them, such as aquatic and terrestrial insects, fish, snails, and algae.



*Gila chub* (*Gila intermedia*)

Highly secretive and can be found in quiet deeper waters, especially pools.



*Speckled dace* (*Rhinichthys osculus*)

Inhabit riffling water over gravel-rubble substrate. It is oftentimes found with loach minnow and desert sucker.



*Spiked dace* (*Meda fulgida*)

Feed primarily on terrestrial and aquatic insects in stream drift. Breeding males show off a brightly golden or brassy color.



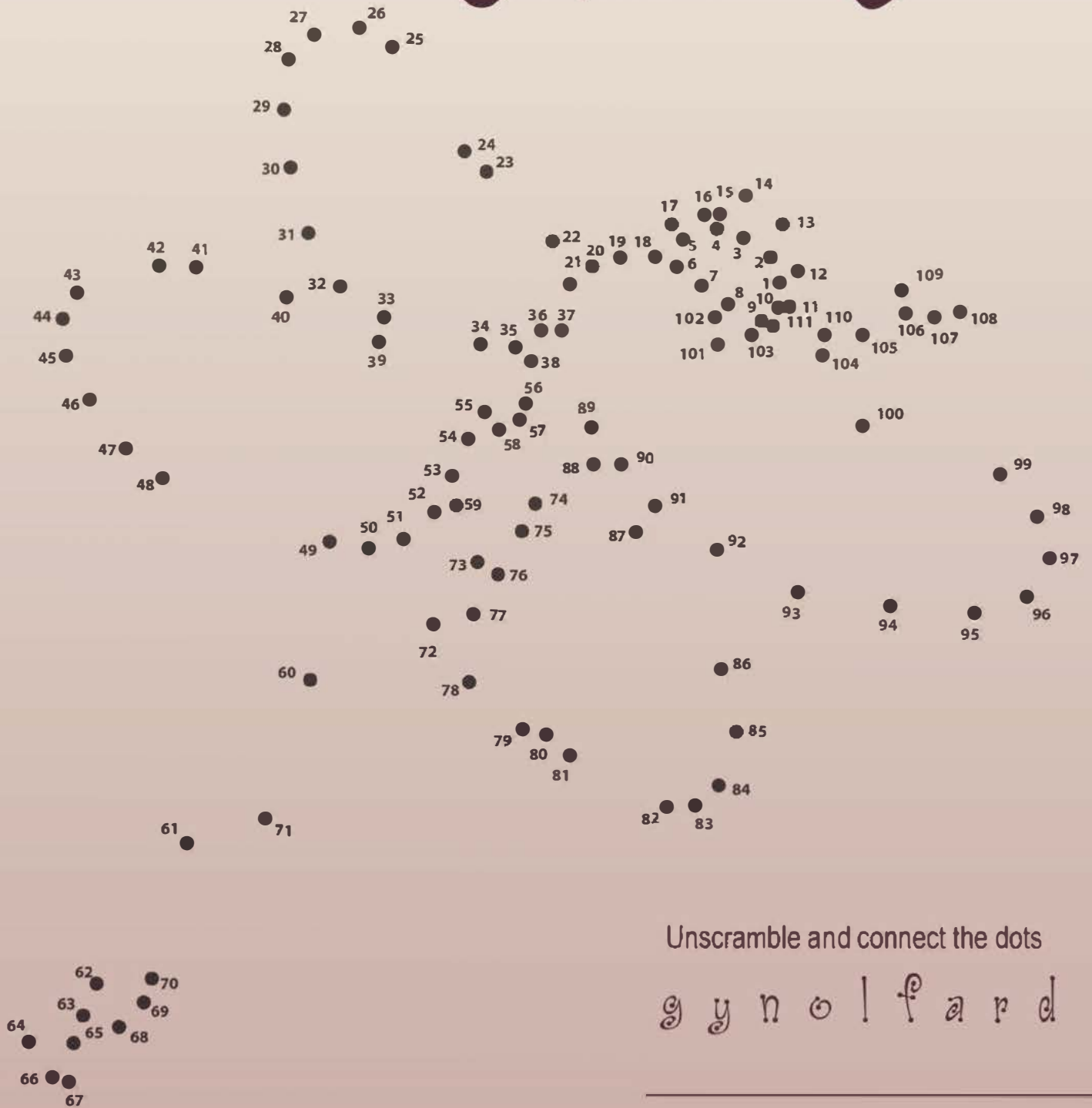
*Longfin dace* (*Agosia chrysogaster*)

Create saucer-shaped nests in the streambed where eggs are laid and newly hatched young grow.

Connect the



Dots



Unscramble and connect the dots

g y n o l f a r d

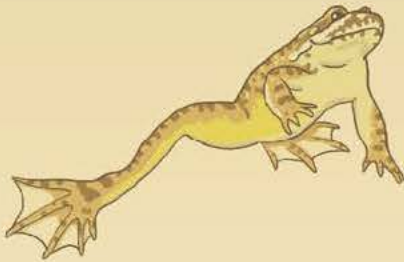


# Other • Native Aquatic Animals



## Sonora mud turtle (*Kinosternon sonoriense*)

The Sonora mud turtle is a small-sized aquatic turtle that is native to the Southwest. When it feels threatened, a mud turtle may emit a foul-smelling musk from glands on the sides of its body, hence the alternative name of "stinkpot." Threats to mud turtle survival include water removal and diversion, agricultural pesticide use, unmanaged livestock grazing, and nonnative bullfrogs and crayfish.



## Lowland leopard frog (*Lithobates yavapaiensis*)

Lowland leopard frogs are small (about 3-4 inches) and are disappearing from Arizona due to predation by nonnative fish and bullfrogs, habitat loss, and a nonnative fungal skin disease called chytrid.



## Beaver (*Castor canadensis*)

Beavers are a "keystone" species, meaning they play a crucial role by maintaining habitat necessary for many other species to survive. Beavers can swim up to five miles an hour and hold their breath underwater for 15 minutes!



## Chiricahua leopard frog (*Lithobates chiricahuensis*)

The Chiricahua leopard frog is federally listed as threatened due to habitat loss and predation by nonnative bullfrogs, fishes and crayfish. It prefers habitats like ciénegas, rocky streams with deep rock-bound pools, springs, and beaver ponds.

# Nonnative/Invasive Species



## American bullfrog (*Lithobates catesbeiana*)

The bullfrog is Arizona's largest frog. Bullfrogs will eat anything that moves and will fit into their mouths, including fish, birds, bats, snakes, and small mammals.



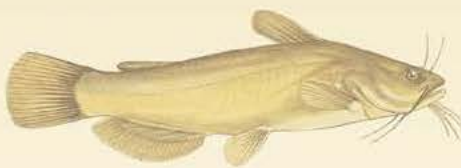
## Western mosquitofish (*Gambusia affinis*)

A small live-bearing fish, commonly used for mosquito control. Mosquitofish are known to eat or harm native fish eggs and small or young fish.



## Green sunfish (*Lepomis cyanellus*)

Nonnative and aggressive, green sunfish are found throughout Arizona. They are known to eat and compete with native fish for food and habitat.



## Yellow bullhead (*Ameiurus natalis*)

Also known as a polliwog, the yellow bullhead is scaleless and has barbels ("whiskers") around its mouth that are used to find food and to feel their way around. They feed at night and will eat almost anything, including native fish.

# HELP

*I'm lost!*

Help Diego find out where he is by solving this puzzle. What National Conservation Area is located 45 miles southeast of Tucson, Arizona, and supports a creek, ciénega, and lush riparian corridor? When you visit this area, you may see Gila chub, Gila topminnow, longfin dace, Chiricahua leopard frog, and Sonora mud turtle.

## SOLVE THE MATH PROBLEMS BELOW TO FIND THE ANSWER!

1.  $(200 - 196) \times 3 =$

2.  $25 - 20 - 4 =$

3.  $(3 \times 6) + 1 =$

4.  $(100 / 5) - 17 =$

5.  $(58 - 54) + 5 =$

6.  $(15 + 12) - (13 + 9) =$

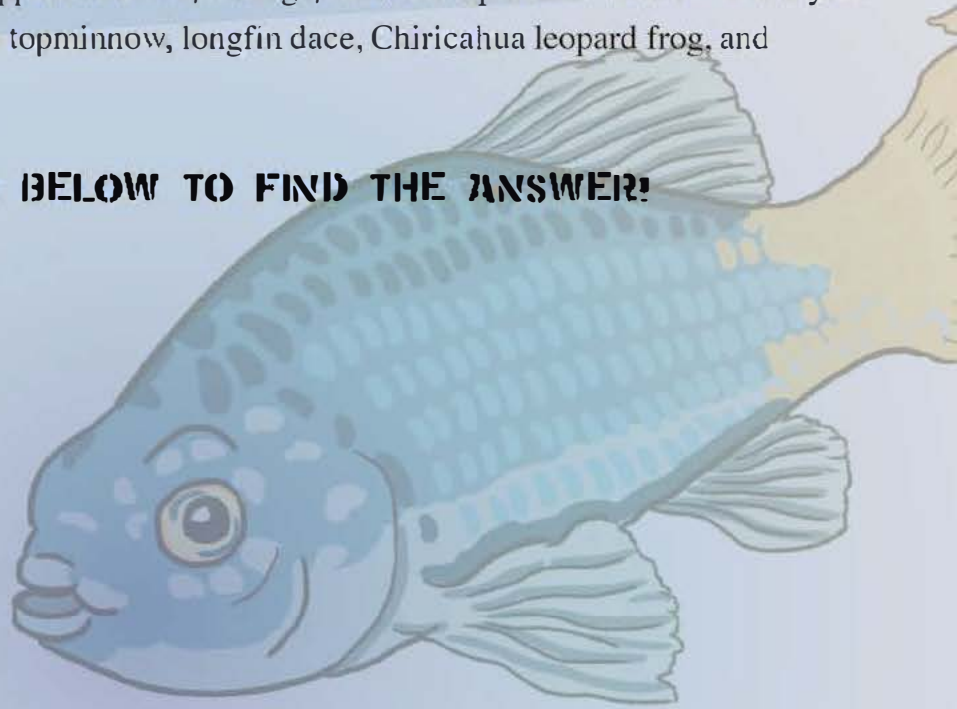
7.  $(3 \times 5) - 1 =$

8.  $(5 \times 2) / 2 =$

9.  $(7 + 7) - (8 - 1) =$

10.  $(3 + 2) - 4 =$

11.  $(10 + 20) - 11 =$



## USE THIS KEY TO CHANGE THE ANSWERS ABOVE INTO LETTERS:

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

## PUT THE DECODED LETTERS IN ORDER ON THESE SPACES:

\_\_\_\_\_



What you can do to provide a safe environment  
for fish & other wildlife

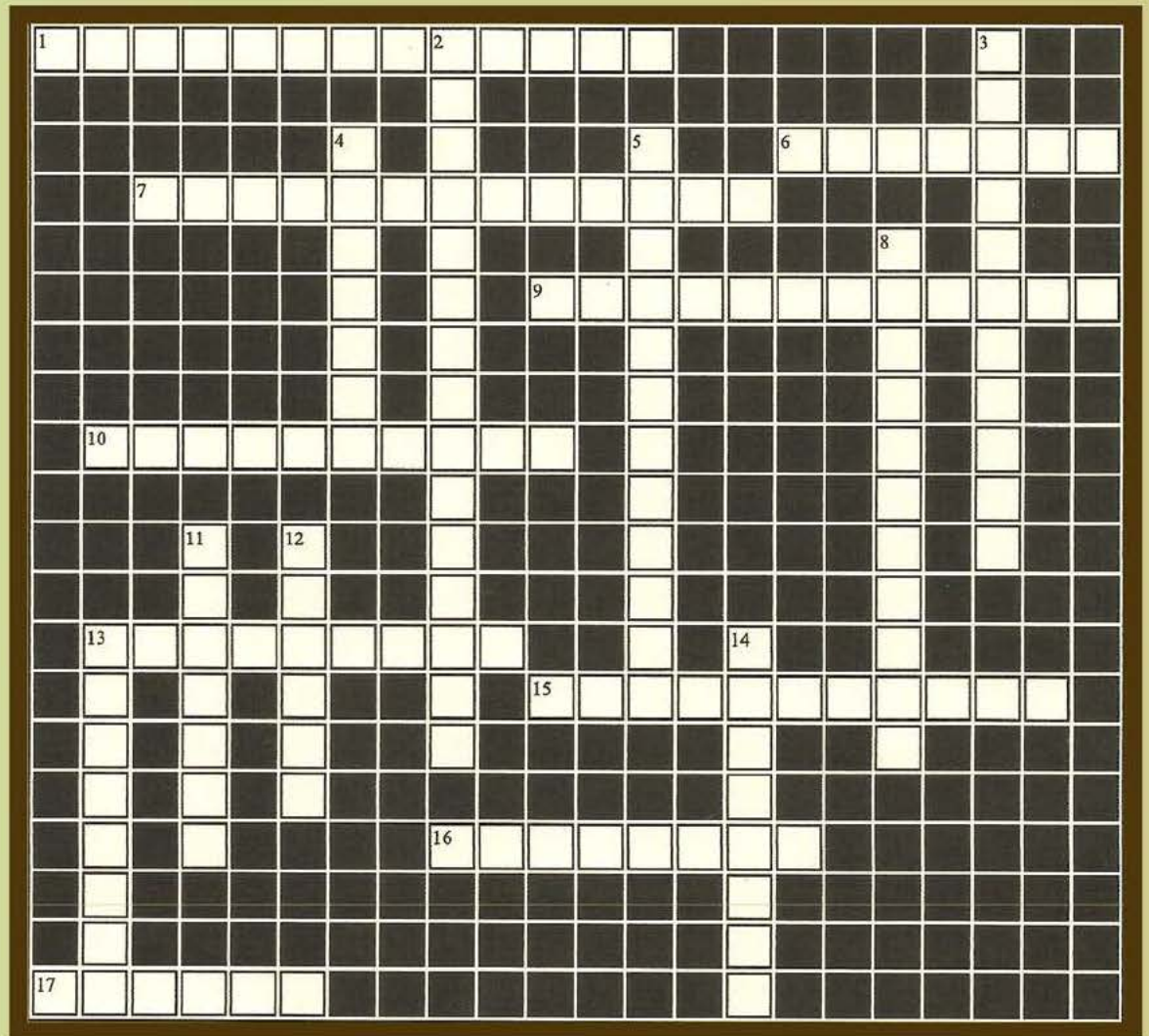


# Recycle!

- **Recycle!** Always dispose of your trash properly, especially plastics. If you see trash around your favorite spot, pick it up for recycling or place it in a trash can where it belongs. Carry a litterbag at all times.
- **Conserve water** so less needs to be pumped out. Turn off water when you are not using it - like when you are brushing your teeth - so enough can be left for the fish to use.
- If you see your friends littering, explain to them that they may be doing a lot more harm than they realize, especially if they sink cans, bottles or other trash. Even though it goes out of their sight temporarily, it ends up in native fishes' homes and can cause long-term problems.
- **Safely cut up large tangles of fishing line** into short sections and throw it in a trash can, or recycle it. Some places collect fishing line for recycling. Whenever you see six-pack plastic rings, safely cut all the rings open, and then recycle them. This little extra effort will help save fish, birds and other aquatic animals.
- **Learn how to identify native fish and where they live.** If you follow the fishing laws, you can prevent accidental fishing of an endangered species.
- **Don't release fish that you brought from any other place into the wild.**
- **Don't release fish or aquatic plants from an aquarium into the wild.**

# W AQUATIC CROSS PUZZLE R D

Answer the questions below to fill in the blanks in the crossword puzzle. If you get stuck on one, fill in the blanks around it to reveal some of the missing letters. You might have to review parts of your Junior Explorer Handbook, if you can't remember the answers to some of the questions. Good luck!



## Across

1. Last free-flowing river in the American Southwest.
6. Gone forever.
7. Known as the "Crown Jewel."
9. I am a nonnative fish that is a threat to native fish. I display aggressive behavior and will defend my nest.
10. Fish that live in arid environments.
13. The tail fin is also known as the?
15. Tiny creature found in springs or seeps.
16. What is the word for a fish that eats both plants and animals?
17. This is a region that receives less than 10-inches of rain a year.

## Down

2. It is important when you are enjoying public lands to follow this Leave No Trace Principle and watch animals from a distance.
3. I am one of the hardiest native fish you have learned about. I create saucer-shaped nests.
4. Water, food, shelter, and space are called?
5. I have a modified mouth that allows me to scrape food off of rocks and other hard surfaces.
8. What do Junior Explorers explore?
11. Related to water.
12. Keystone species.
13. What word means "to protect animals, plants, and their habitats for the future?"
14. Bottom-feeding fish have this type of mouth.

# SONORA MUD TURTLE!

Its carapace (shell) is olive to brown in color and is often covered with algae, which helps disguise it from predators.



How can you be a responsible Junior Explorer when you visit aquatic environments?

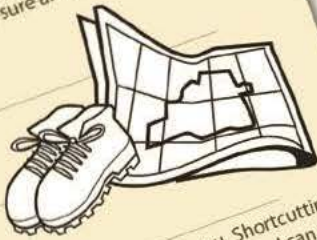
# Leave No Trace!

Here's how to do it:

1.

**Know before you go!**

The animals and plants that live in the wild have everything they need to survive...fur coats, sharp eyes, fast feet, etc. When you visit wild places, make sure you do, too. Bring clothes and footwear to protect you from cold, heat or rain. Learn how to use maps, and bring one for the place you are visiting. Read about the forests and deserts and how to prepare for a visit. Make sure an adult knows your plans, or is with you.



2.

**Choose the right path!**

Deer and other wildlife use trails, and so should you. Shortcutting or stepping off the trail can hurt plants and young trees, and can also cause the soil to wash away. Use campsites that are already there, and that are at least a half a football field away from water.



3.

**Trash your trash!**

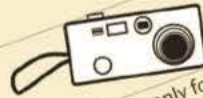
Never toss litter on the ground. Potato chip bags take up to 20 years to rot away. Soda cans take 500 years, and plastic soda bottles and styrofoam NEVER will go away!



4.

**Leave what you find!**

Take only photographs and memories, and leave only footprints. Make sure that the next person to visit the area can also enjoy the pretty flowers, rocks, and interesting artifacts.



5.

**Be careful with fire!**

Fire can both save and destroy lives, so use it wisely. Camping stoves are much better for cooking food, so ask adults to use them when possible. If you need to build a fire, build it where stone or steel rings have already been established. Never break branches, or chop live trees to get wood for your fire. Never try to burn glass, metal, or plastic litter in your fire.



6.

**Respect wildlife!**

It is never a good idea to feed human food to wildlife. Although you think you are helping them, you are actually hurting them. Never approach wildlife no matter how friendly they may appear. Take photos from a safe distance. Never allow your pets to chase wildlife.

7.

**Respect other visitors!**

Visiting a natural place is much different than visiting a ballpark or playground. People visit natural places to hear the wind blowing through the trees, the birds singing, or other natural sounds. Some just like to enjoy the quiet. Try hard not to shout or make loud noises, walk quietly instead of running, and be sure to keep noisy pets at home.

The "LEAVE NO TRACE" principles are designed to assist those who enjoy the outdoors with decisions on how to reduce their IMPACTS when they are enjoying nature.

# Muleshoe

# Ranch

## WORDS

## SEARCH

Can you help Diego find the 23 words listed below? Words appear straight across, down, and may over-lap other words.

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

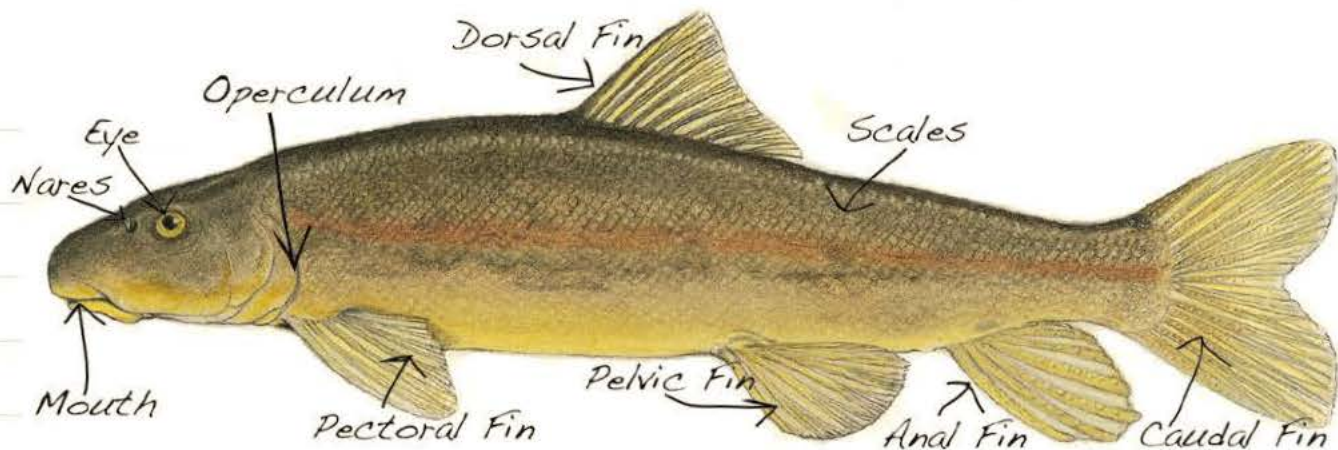
The Nature Conservancy  
Redfield Canyon  
Aquatic Habitat  
Pool  
Riparian  
Riffle  
Conservation  
Gravel

Desert Fishes Council  
Algae  
Desert Pupfish  
Endangered  
Prey  
Gila Chub  
Loach Minnow  
Junior Explorer

Leopard Frog  
Litter  
Parasites  
Protection  
Seep  
Sonora Mud Turtle  
Partners



# Fish Anatomy



Anal Fin - Single fin mounted vertically below the fish. Fin is used to stabilize the fish while swimming.

Pelvic Fin - Paired fin that is located below and behind the pectoral fins. The pelvic fins assist the fish in going up or down through the water, turning sharply, and stopping quickly.

Caudal Fin - The tail fin, located at the end of the caudal peduncle. It is used for propulsion.

Dorsal Fin - Located on the back of the fish. A dorsal fin helps the fish maintain balance.

Eye - Used for sight. They use their vision to escape predators and find food.

Operculum (gill cover) - The operculum is the bony flap that protects the gills. It opens and closes to allow water to pass over the gills.

Gills - A breathing organ that filters oxygen from the surrounding water. Gills are located under the operculum.

Mouth - Opening in the front of the head for feeding.

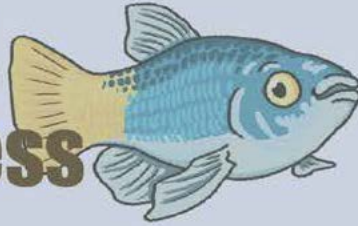
Pectoral Fin - Paired fin, one on each side of the body behind the gills. This fin allows for quick changes in side-to-side direction and speed. It also acts as a brake to decrease speed.

Nare - Similar to nostrils, except nares are used for smelling only (nostrils are used for both smelling and breathing).

Scales - Scales protect the fish from injury.

# Aravaipa

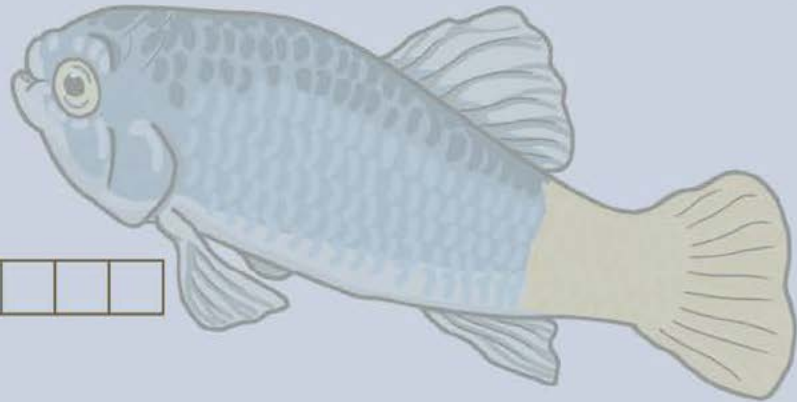
## Canyon Wilderness



A desert stream and majestic cliffs make Aravaipa Canyon one of Arizona's natural wonders. Aravaipa Creek is perennial, meaning there is water year-round providing habitat for seven of my fishy friends, two of which are endangered. The water also supports a riparian forest of cottonwood, willow, and sycamore trees. If you visit Aravaipa you will find Sonora suckers and roundtail chubs swimming in deep pools of clear and cool water. If they detect your movement, they will dart under cover and hide. In areas of the creek with slow-flowing water and sandy bottoms, you may see longfin dace and their nests.

Help Diego unscramble each of the clue words to find out why Aravaipa Creek is such a great place for desert fish. Take the letters that appear in boxes and unscramble them for the final message.

neevs



fficl

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lopo

attbhia

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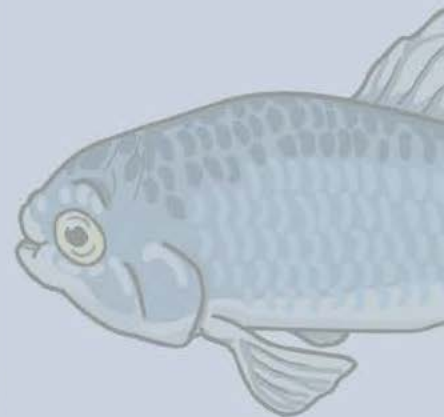
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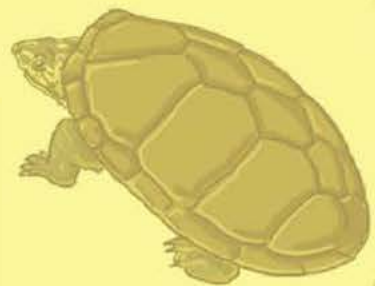


# San Pedro Riparian National Conservation Area

The San Pedro RNCA provides important habitat for desert fish, beaver, breeding and migratory birds, and the endangered Huachuca water umbel, a native plant. Diego needs your help to find the secret message hidden in the word maze below. Once you find all of the words, the hidden message will be revealed. Words can be forward, backward, or diagonal. There are no spaces between words.

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

- |                 |                 |                 |
|-----------------|-----------------|-----------------|
| Aquatic Habitat | Arizona         | Birds           |
| Bird Watching   | Conservation    | Cottonwood Tree |
| Desert Sucker   | Explore         | Free Flowing    |
| Leopard Frog    | Litter          | Longfin Dace    |
| Native Fish     | Nonnative Fish  | Pollution       |
| Protection      | Recycle         | Respect         |
| Riparian        | San Pedro River | Water Umbel     |







Unscramble the tiles to reveal a message.

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ATIV UPFI SH A

□ □ □ □ □ □

□ □ □

T NA H EA NFIS TIVE GREE FIS

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CE R YCLE REC EUSE REDU

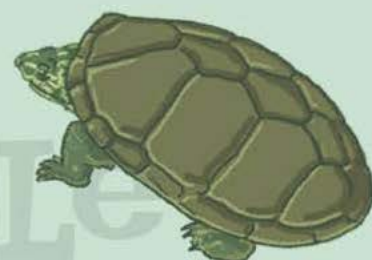
□ □ □ □ □

BEAV PECI A KE NE S ERS ES

ARE YSTO

□ □ □ □ □ □

□ □



FISHY SCRAMBLE

If you complete this booklet, you will learn the words in this

# Glossary:

**Acre:** A measure of land equal to 43,560 square feet.

**Aquatic:** Related to water; living in or near water.

**Ciénega:** A spring that forms a wet, marshy area at the base of a mountain or in a canyon where groundwater bubbles to the surface.

**Conservation:** The process of using or managing a natural resource to prevent its waste, harm, or destruction.

**Desert:** A region receiving less than 10" of rain a year, or a region that loses more water than it gets.

**Endangered Species:** A population of organisms that is likely to become extinct if steps are not taken to save it.

**Environment:** All living and non-living things.

**Extinct:** A species that no longer exists.

**Flow:** How fast water is moving.

**Habitat:** The natural environment of a plant or animal. Habitat must include food, water, shelter, and space for all life stages (ages).

**Herbivore:** An animal that eats only plants.

**Intermittent:** A stream that flows only at certain times of the year. When not flowing, the water may remain in isolated pools, and although surface water may be absent, it might be underground.

**Iridescent:** Used to describe surfaces that appear to change color when looked at from different angles.

**Keystone Species:** A keystone species is a species that is so interconnected with the other species in its ecosystem that its disappearance changes the balance of the whole ecosystem.

**Meander:** A winding curve or bend of a river.

**Native Species:** Naturally occurring in an area.

**Nonnative Species:** Not naturally occurring in an area.

**Omnivore:** An omnivore is a kind of animal that eats either other animals or plants.

**Organism:** Any living thing that has living characteristics and is composed of one or more cells.

**Perennial:** A stream with water year-round.

**Pollution:** Waste products that damage the natural environment.

**Pool:** A quiet, slow-moving portion of a stream.

**Species:** A group of organisms that breed with each other and produce offspring.

**Spring/Seep:** A small pool where water from the ground slowly collects on the surface.

**Stream:** A body of water with a current, enclosed by a stream bed and banks.

**Substrate:** The material that forms the bed of a stream.

**Riparian:** The habitat areas between aquatic and upland habitats that usually look different than the surroundings because the presence of water has an influence on what can live there.

**River:** A natural freshwater waterway that flows towards a lake, sea, or ocean.

# More Places to Play and Learn!!!

on our  
**NATIONAL CONSERVATION LANDS**



**NATIONAL  
CONSERVATION  
LANDS**

Book illustrations by Rachel Ivanyi

National System of Public Lands  
U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT



# Junior Explorer Oath

I promise to help protect the desert fish,  
public lands, my community, and the Earth by being an active and responsible  
steward of the environment.

I promise that I will not feed wild animals.

I promise to leave rocks, plants, artifacts, and historic objects  
as I found them for everyone to enjoy.

I promise to explore, learn about, and respect the world wherever I go.

I promise I will share what I learn with others.

Signed \_\_\_\_\_

Date \_\_\_\_\_

