

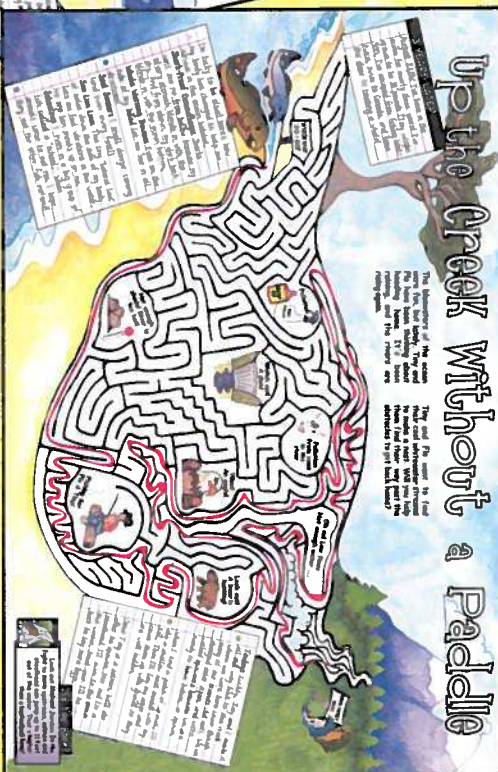
Word Scramble

- anadromous
- endangered species
- ocean, river
- waterfalls
- salmonid savers

Answers to the Habitat Detective Checklist



Up the Creek Without a Paddle



Saving Water

- 4
- 2,500
- 2
- 4,200
- 16.5
- 60,000
- 35
- 100
- 1
- 10
- 100

Protecting Habitat

Keep our water clean! Avoid spilling gasoline, oil, soap, or other pollutants in the water or on land.

Pick up litter, including worn line, old hooks, and trash that other people dropped.

Reduce how much you buy, reuse old containers, and recycle to save water and energy and prevent pollution.

Take the Ethical Angler pledge to be respectful when you're fishing (www.boatus.com/angler/survey.htm)

Tell your friends and family how they can help protect salmon and steelhead habitat.

Fortunate or Unfortunate

- Unfortunately, rain from a huge storm ...
- Fortunately, there were lots of trees ...
- Unfortunately, when Flo was still really young ...
- Fortunately, schools put labels on the drains ...
- Unfortunately, just after she got to the ocean ...
- Fortunately, the people used the Circle Hook ...
- Unfortunately, it hadn't rained very much that fall ...
- Fortunately, people living upstream ...
- Unfortunately, other people built a dam ...
- Fortunately, the dam was small enough ...

Salmonid Savers is brought to you by the following organizations:



U.S. Department of Commerce, NOAA-National Marine Fisheries Service.

Southwest Regional Office <http://swr.nmfs.noaa.gov>

Mission: Stewardship of living marine resources through science-based conservation and management and the promotion of healthy ecosystems.

NOAA Office for Law Enforcement, Long Beach Regional Office

www.wenecdlaw.info

Mission: Protecting and preserving our nation's living marine resources and their habitat using outreach, education and enforcement.

California Department of Fish and Game

www.dfg.ca.gov

Mission: To manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public.

South Yuba River Citizens League (SYRCL) RiverTeachers Program

www.riverteachers.org and www.yubariver.org

Mission: To deepen students' understanding of ecological principals, foster their connection with their watershed, and develop their role as watershed stewards through a wide array of fun, educational experiences.

Want more copies?

Contact SYRCL's RiverTeachers Program
216 Main Street
Nevada City, CA 95959
(530)265-5961 x204
(530)265-6232 fax
www.riverteachers.org

A special thank you to Sandra Lowry, Yurok, for the story and basketry design on "Catch of the Day."



This booklet was printed on 30% recycled paper.

Salmonid Savers

Written & Illustrated by Carlyle Holmes & Kathy Dofson (SYRCL)

What are Salmonids?!

Go with the Flow!

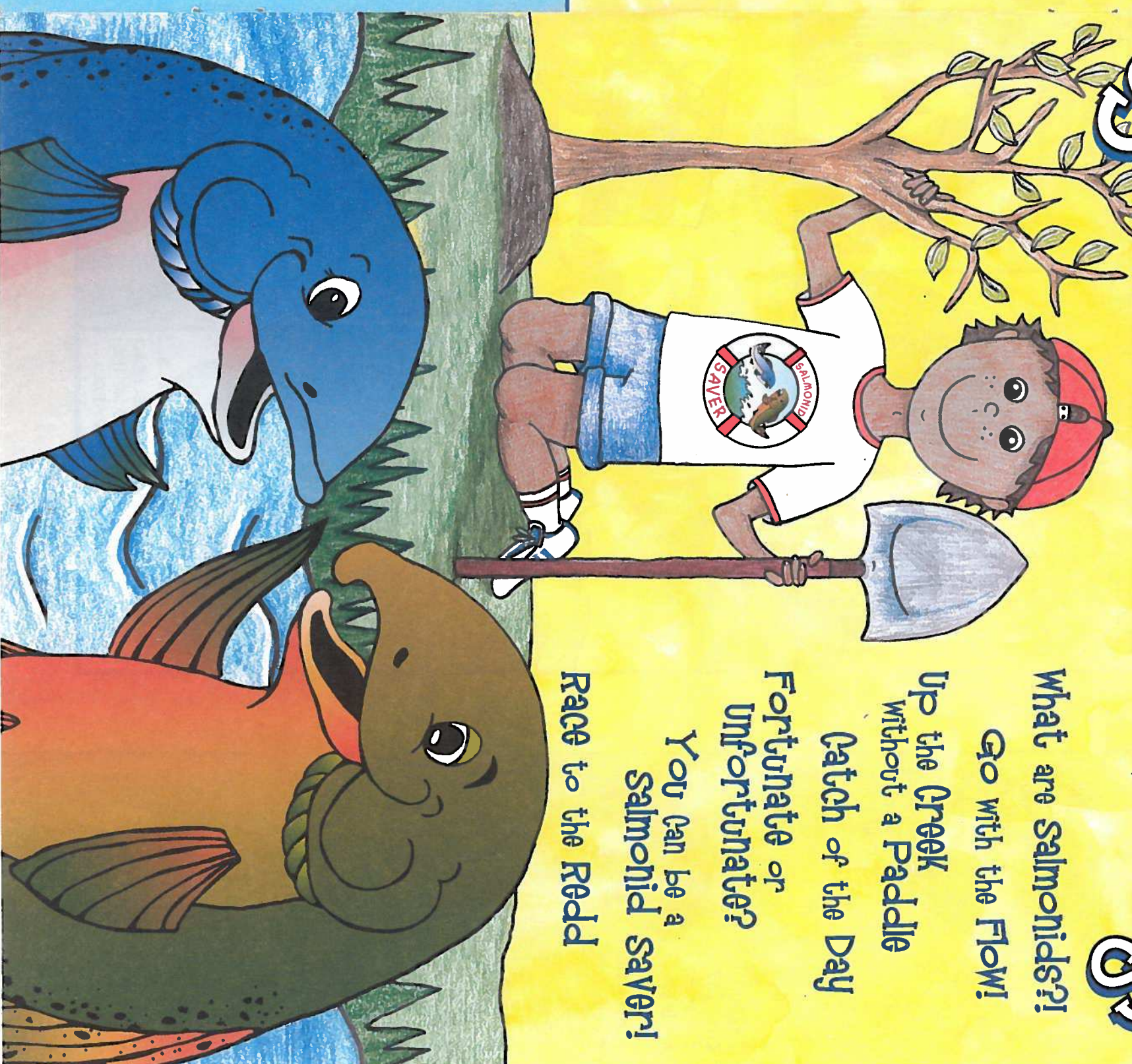
Up the Creek Without a Paddle

Catch of the Day

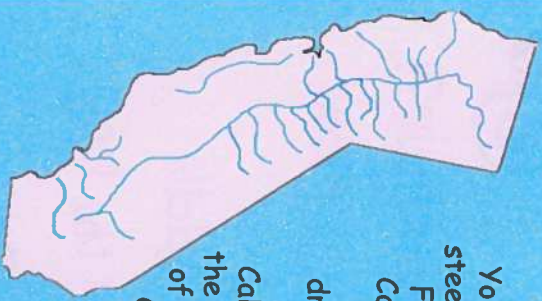
Fortunate or Unfortunate?

You Can Be a Salmonid Saver!

Race to the Redd



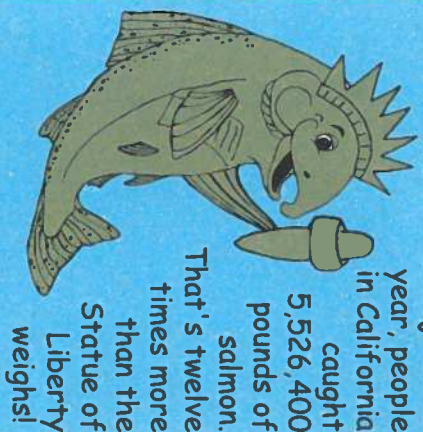
Cool Salmonid Facts



You can find steelhead like Flo all over California—from the dry lands in Southern California to the redwoods of Northern California.



Over 137 different kinds of animals eat salmon and steelhead.



In just one year, people in California caught 5,526,400 pounds of salmon. That's twelve times more than the Statue of Liberty weighs!



"Tiny" is really just a nickname, because the largest salmon ever caught was 129 pounds!

What are Salmonids?

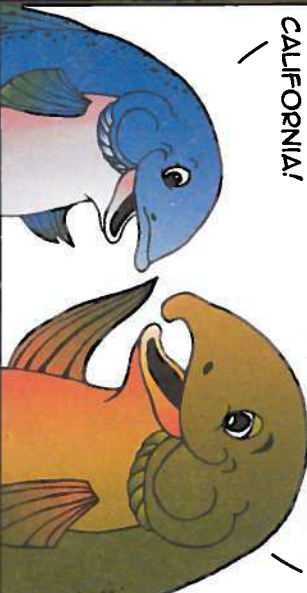
HI! MY NAME IS FLO, AND THIS IS TINY. WE ARE TWO OF THE COOLEST KINDS OF FISH IN CALIFORNIA!

FLO IS A STEELHEAD TROUT, AND I AM A CHINOOK SALMON. WE BELONG TO THE "SALMONID" FAMILY OF FISH.

THE BEST THING ABOUT US IS THAT WE'RE ... ANADROMOUS!

TINY, THEY DON'T LOOK IMPRESSED.

DON'T THEY KNOW THAT ANADROMOUS FISH CAN JUMP UP WATERFALLS?

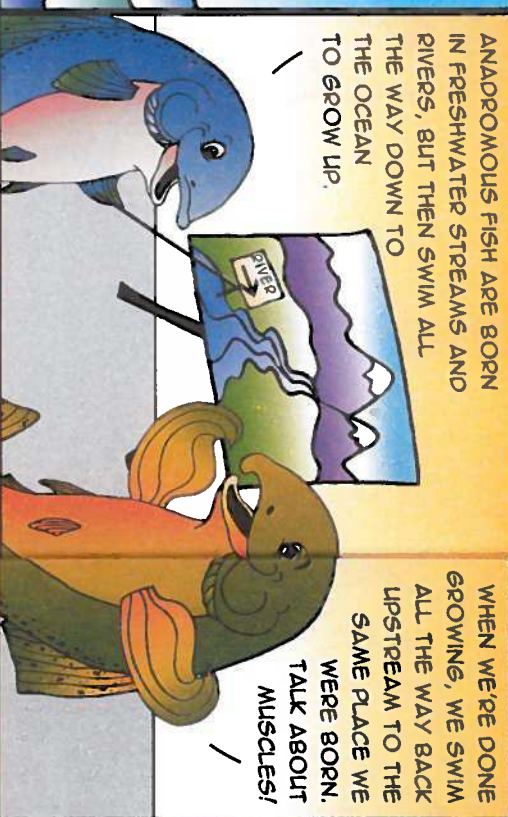
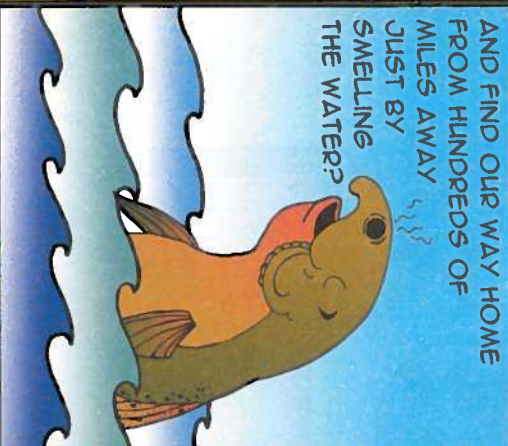


AND FIND OUR WAY HOME FROM HUNDREDS OF MILES AWAY JUST BY SMELLING THE WATER?

ANADROMOUS FISH ARE BORN IN FRESHWATER STREAMS AND RIVERS, BUT THEN SWIM ALL THE WAY DOWN TO THE OCEAN TO GROW UP.

WHEN WE'RE DONE GROWING, WE SWIM ALL THE WAY BACK UPSTREAM TO THE SAME PLACE WE WERE BORN. TALK ABOUT MUSCLES!

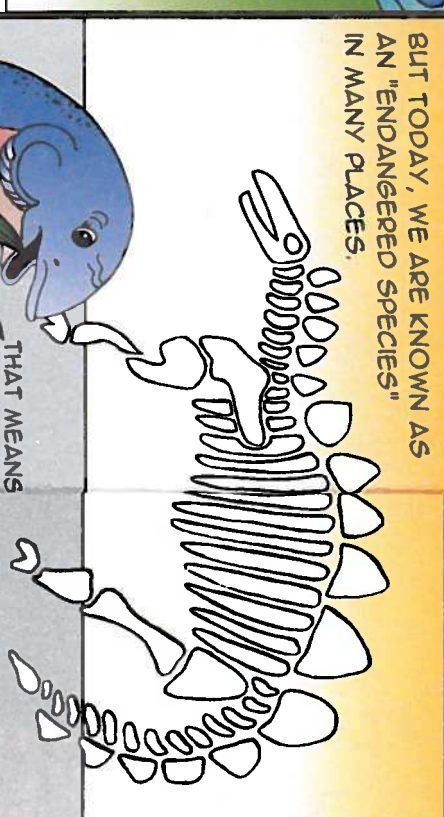
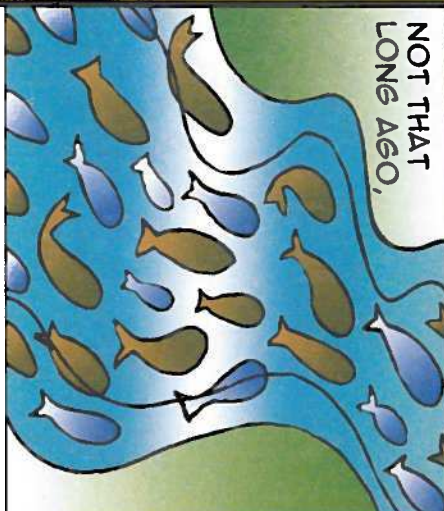
BECAUSE WE TRAVEL FROM THE RIVERS TO THE OCEAN AND BACK AGAIN, WE CONNECT THESE TWO PLACES IN A LOT OF WAYS.



THAT'S WHY WE'RE CALLED THE BLUEWATER (OCEAN) TO WHITEWATER (RIVERS) CONNECTION.

NOT THAT LONG AGO,

BUT TODAY, WE ARE KNOWN AS AN "ENDANGERED SPECIES" IN MANY PLACES.



THERE WERE MILLIONS OF STEELHEAD AND SALMON SWIMMING UP THE RIVERS IN CALIFORNIA EVERY FALL ...

THAT MEANS PEOPLE ARE WORRIED THAT IF THEY DON'T TAKE CARE OF US, WE MIGHT DISAPPEAR JUST LIKE THE DINOSAURS DID.

THAT'S WHY WE NEED YOUR HELP!



THIS BOOKLET WILL HELP YOU BECOME A **SALMONID SAVER** - AN EXPERT ON HELPING US SURVIVE.

Word Scramble

Unscramble the words below to complete the sentences. Check these two pages for clues.

1. Fish that are born in freshwater, but swim to the ocean and back are called (radanusmoo.)

2. Salmon and steelhead are in danger of disappearing, so they are called (eddeeangrn escispe.)

3. Salmon and steelhead connect the (nceoa) to the (eriv), so they're called the bluewater to whitewater connection.

4. Salmon and steelhead are so strong that they can jump over (trllfsaawe.)

5. People who help salmon and steelhead are called (dmshiano aevssr.)

Did You Know?

Some salmonids swim over 2,400 miles to get back to their home streams. That's like swimming from California to Hawaii!



Go With the Flow!

The first step in becoming a **salmonid saver** is to find out what salmonids need to survive. Once you know, then you can help make sure they get it! Read Flo's journal and habitat checklist to find out more.

Habitat Detective Checklist

An animal's habitat is the place where it lives. Animals need food, water, space, and shelter in their habitat. This checklist shows some of the things that salmon and steelhead need in their habitat to survive.

How many things can you find in this picture?

Space

Free-flowing river all the way to the ocean (no big waterfalls or dams)

Riffles: shallow, choppy water to lay eggs

Food

Stonefly nymph

Mayfly nymph

Caddisfly nymph

Midge larva

Water

Clean water around 55°F

Shelter

Gravel to cover eggs

Fallen logs & tree roots to hide under

Plants growing near riverbank

BONUS:

How many of these things can you find in a river or stream near you? (Bring an adult with you for safety!)

October 12: Today's my birthday! I'm in a redd (that's the name of our nest) with 3,000 brothers and sisters in tiny eggs the size of your thumbnail! We have to stay hidden under the gravel or we'll get eaten. Man, it's boring down here!



January 3rd: I've finally hatched, and boy, I look weird. I'm called an 'alevin' now (al-luh-vin). At least this pouch on my stomach is full of yolk so I don't have to worry about finding food.



January 17th: The riverbank collapsed today and half of our redd got covered in mud. It was so scary! The mud clogged my gills and made it hard to breathe.

January 26: I'm hungry! My yolk sac is gone so I'll have to swim out of the gravel to find food. Bigger lots of the birds have eaten lots of the other alevin! At least my body is turning brown so I will be harder to see.

January 27th: I did it! Even though I'm small, I darted out from under the gravel and caught a bug. Now, I am a 'fry,' not just a baby alevin.



March 21st: It's been great living in this river-lots of bugs to eat, cold water, plenty of shade. But I'm getting restless. I hear the ocean has TONS of food ...

April 2nd: Rainstorm! I'm going to use the water from this storm to push me downstream. Ocean, HO!

May 12th: The water tastes strange today. At first I thought it was pollution, but it's just that the water is getting salty!

May 30th: It's unbelievable! There are THOUSANDS of other steelhead and salmon here in the estuary. They came from whitewater rivers all the way up into the mountains.

June 2nd: I met a cool salmon named Tiny. His life has been just like mine so far! Now that we're almost to the bluewaters of the ocean, we are turning silver and we're called 'smolts'. Tomorrow, I'm making a break for the ocean!



Up the Creek Without a Paddle

3 YEARS LATER

August 24th: I've been in the ocean for nearly three years! I've grown to be 18 pounds (Tiny weighs 50!). I've escaped from fishing hooks twice, swam to Canada, and come this close to touching a whale!

The bluewaters of the ocean were fun, but lately, Tiny and Flo have been thinking about heading home. It's been raining, and the rivers are rising again.

Tiny and Flo want to find their cool whitewater streams to make a nest. Will you help them find their way past the obstacles to get back home?

WHICH WAY DO I GO?



Pollution

Watch out! A dam!

Pollution from cows in the river.

Yikes! An eagle!

Look out! A bear is hunting!

Oh no! Low flows Not enough water ...

HOME SWEET HOME

I'm lucky to be alive! Here's how my body has changed to help me survive in the ocean habitat.

Shark-Proof Camouflage: Sharks can't see me from below with the silvery stomach blends in with the sky. And from above, my dark back blends in with the ocean bottom.

Whale Warning Devices: Eyes on all side of my head let me see in all directions! I smell danger coming directions! I smell danger coming directions!

Seal Sensor: I smell danger coming directions! I smell danger coming directions! I smell danger coming directions!

Sea Lion Line: This tiny of my body of holes down the side of the water, lets me feel vibrations in the water.

Schooling: I swim in a big group of fish called a "school." When animals come to eat me, I hope they eat the other fish instead!

Today: Luckily, Tiny and I made it all the way back to this creek where we were born (even though changed color again, and we're ready to have babies, because we are when I find a patch of gravel, or spawn, dig a shallow nest (tread) with my tail. Then I'll lay my eggs and cover them up with gravel so they are well hidden.

Since Tiny is a salmon, he'll die after he spawns. Not me! I'm a steelhead. I'll swim to the ocean back to lay more eggs.

Did You Know?

Look out Michael Jordan: In the fight to swim upstream, salmon and steelhead can jump up to 11 feet out of the water. That's higher than a basketball hoop!

A Salmonid Timeline

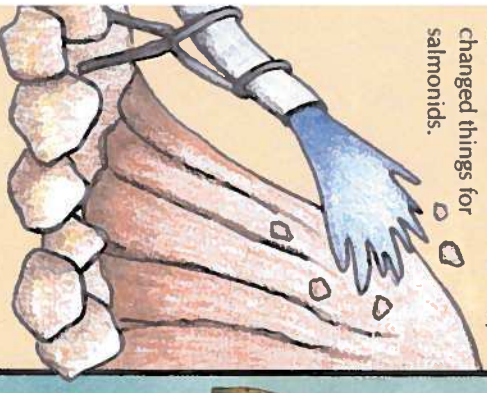
1500s: European explorers came to California and saw Native American tribes catching salmonids for food and clothing.



1805: Lewis and Clark were welcomed to the Pacific Northwest with a meal of salmon. Salmonids were still plentiful due to careful fishing by Native Americans, but the fur trade, gold rush, railroads, and timber clear cuts radically changed things for salmonids.

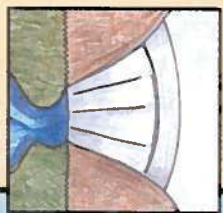


HERE IS A STORY FROM THE YUROK TRIBE IN NORTHERN CALIFORNIA THAT SHOWS HOW IMPORTANT IT IS FOR SALMONIDS TO HAVE HEALTHY RIVERS.



1848: Gold Rush!
Gold miners used water cannons to blast the hills and find gold. Soil washed into rivers, changing the habitat and killing salmonids.

1850:
People built dams to store water. But the dams cut salmonids off from their home rivers and altered water flows and temperatures in rivers drastically. Many of these dams still affect salmonids today.



Catch of the Day

Ever since people have been in California, salmonids have been an important source of food. Salmonids are a resource for everyone and are held in a Public Trust. This means that people have developed ways to take care of them for future generations. Check out the timeline and story to see some of the ways that people take care of the fish AND what happens when they forget.



In the beginning, the world was a very different place. There were no people at all—only spirits called woge (pronounced woh-gay).



One day, the Great Spirit—whose name was Wah-pec-ah-mao—called all the woge together. He told them it was time to fill the world with people and to give them trees, rocks, water, and food. Wah-pec-ah-mao told the woge that they could each choose whatever they wanted to be to help the Yurok in this new world. He gave them examples of the things they might be, how they might look, and what their jobs might be.

One of the woge was called Oregos, and she wanted to help people. Wah-pec-ah-mao told her that if she chose to be a rock at the mouth of the Klamath River, right where it meets the ocean, then she would have a chance to help people forever. So Oregos decided to become that rock.

She turned into the image of a woman with a basket on her back for carrying heavy loads to honor the Yurok women's qualities of hard work and caring. The job of Oregos was to guide the fish so the Yurok would have lots of salmon to dry and smoke for their winter food.

Every fall, when the maple leaves begin to turn red, the salmon return from the sea. They go straight to Oregos to find out if it is safe for them to go up the river to the spawning grounds where they were born.

Oregos knows every stream, the big ones and the small ones. She knows how deep the water is and whether the river is blocked by dirt or rocks or fallen trees. She knows whether the gravel where the salmon lay their eggs is clean or covered with mud. She knows how many bear, otter, and eagles might try to harm them as they swim up the river. And she knows exactly when the rains will come. It is her job to know about everything that will affect the fish—not just salmon, but steelhead, eels, candlefish, trout, and sturgeon.

As the salmon gather around Oregos, the rains come and fill the streams, making it easier for the fish to swim. When the conditions are just perfect, Oregos tells the fish that it's time. Happily, they dash upstream to their spawning grounds, their silver Oregos has helped the fish get back home once again.

For as many years as anyone can remember, Oregos has assisted the Yurok people by guiding the fish they depend on for food. If you go to the Klamath River today, you can see Oregos where the river meets the ocean, still guiding the fish home.

Happily, they dash upstream to bodies flashing in the light.

TODAY: Salmonid Savers all over California are working to help salmon and steelhead.

2002: 34,000 salmon died on the Klamath River in Northern California because the water was too hot and they got sick. There is still work for Salmonid Savers like you!



1999: People removed 2 dams on Butte Creek near Chico, California, that were blocking salmonids from 25 miles of river habitat. Others helped Salmonids by restoring riverbanks, replanting trees, creating spawning sanctuaries, and cleaning rivers.



1994: The first California salmonids were protected under the Federal Endangered Species Act. It set rules to limit harmful activities like clear-cutting trees near rivers, over-fishing, and removing too much water from rivers.

1977: The United States Congress passed the Clean Water Act to protect water quality and keep our rivers clean. Salmonids Savers rejoiced.



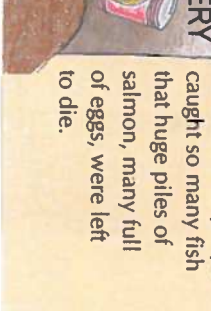
WILD & SCENIC

1968: The United States Congress created the Wild and Scenic Rivers Act, which protects important salmonid rivers from new dams.

1884: Mining with water cannons was made illegal. Clean water flowed once again, and fish could breathe and grow strong!



1863: First salmon cannery opened on the Sacramento River. By stretching fishing nets from bank to bank, people caught so many fish that huge piles of salmon, many full of eggs, were left to die.



1970: The first Earth Day inspired people to protect the environment. Later that year, the Environmental Protection Agency (EPA) was formed.



OUR Biggest Challenges

are the

4H's



Habitat

Destruction

Our habitat is the place we live, from streams to the ocean. Anything that hurts our habitat, by putting pollution or mud in it, or by taking too much water out of it, can really hurt us.

Hydro (Dams)

With a dam in the way, Tiny and I can't get back upstream to spawn. Even with fish ladders, we can get lost in the reservoirs, and our babies will fall down over the dam on their way to the ocean. Not all of them will survive.

Harvest

When people catch too many fish and don't follow fishing regulations, there aren't enough of us left to lay eggs for next year.

Hatcheries

People build hatcheries (buildings where salmon can grow up) to replace habitat blocked by dams. Hatcheries do ensure high survival of fry, but hatchery fish can spread diseases and fight with wild fish for food.

For What or What?

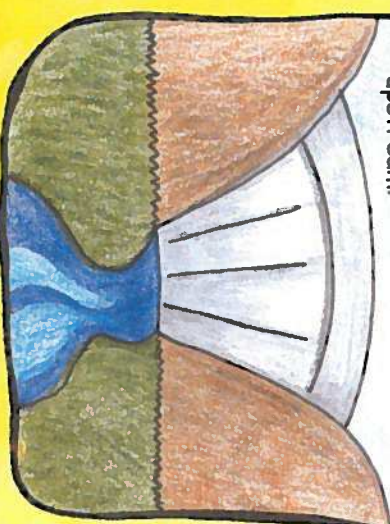
One day, Flo's parents made a lovely nest in the gravel and had 3,000 steelhead trout eggs. Fortunately, Tiny's parents covered her with gravel, to keep her safely hidden.

1

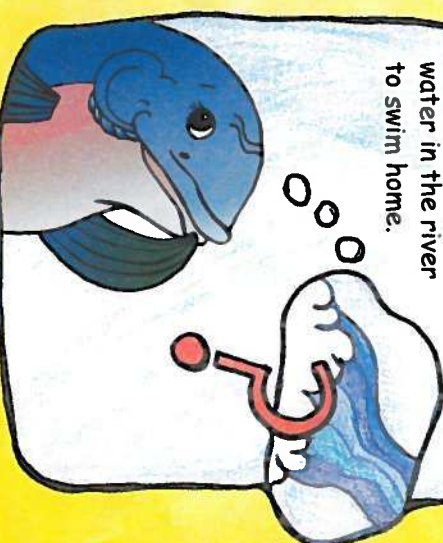
Will Flo and Tiny's fate be fortunate or unfortunate? Put the pieces of the story in order to find out. The first piece is done for you.



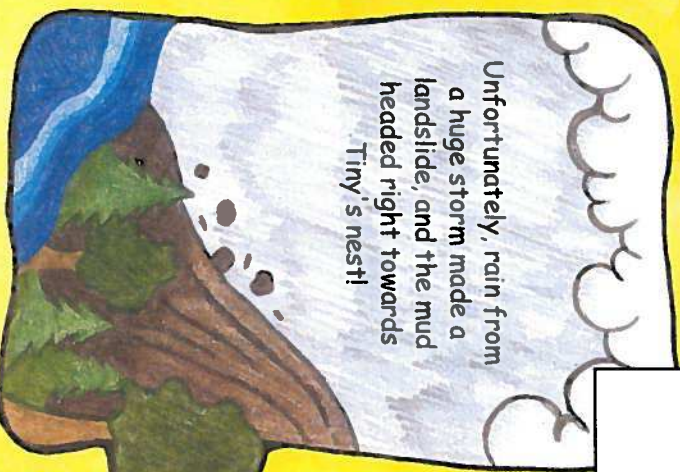
Unfortunately, other people built a dam blocking the way back upstream.



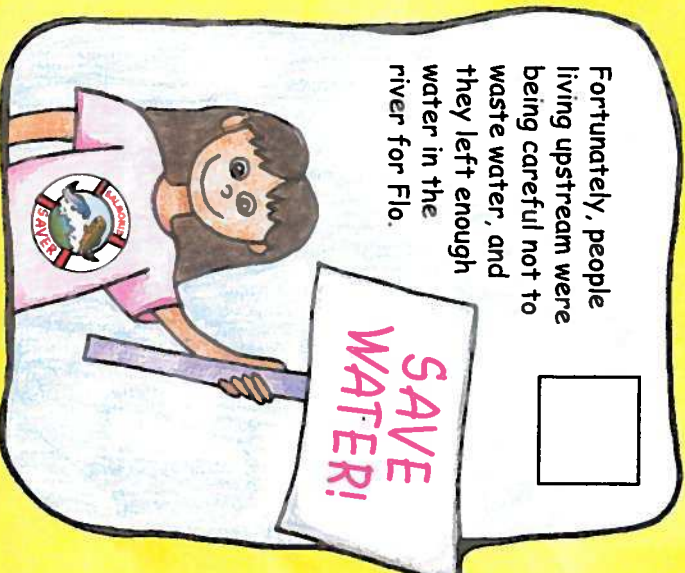
Unfortunately, it hadn't rained very much that fall, and Flo needed lots of water in the river to swim home.



Unfortunately, rain from a huge storm made a landslide, and the mud headed right towards Tiny's nest!



Fortunately, people living upstream were being careful not to waste water, and they left enough water in the river for Flo.



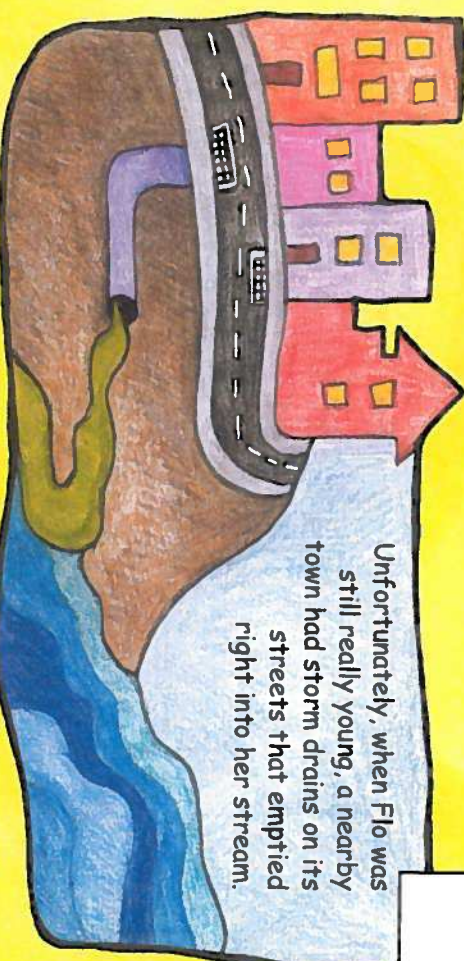
Fortunately, there were lots of trees near the stream. The tree roots stopped the mudslide, and Flo was able to hatch.



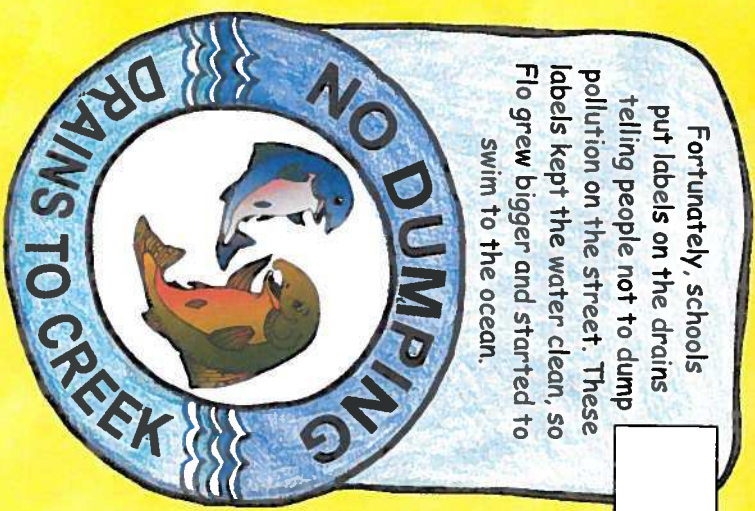
Unfortunately, just after she got to the ocean, Flo got caught on a fishing hook!



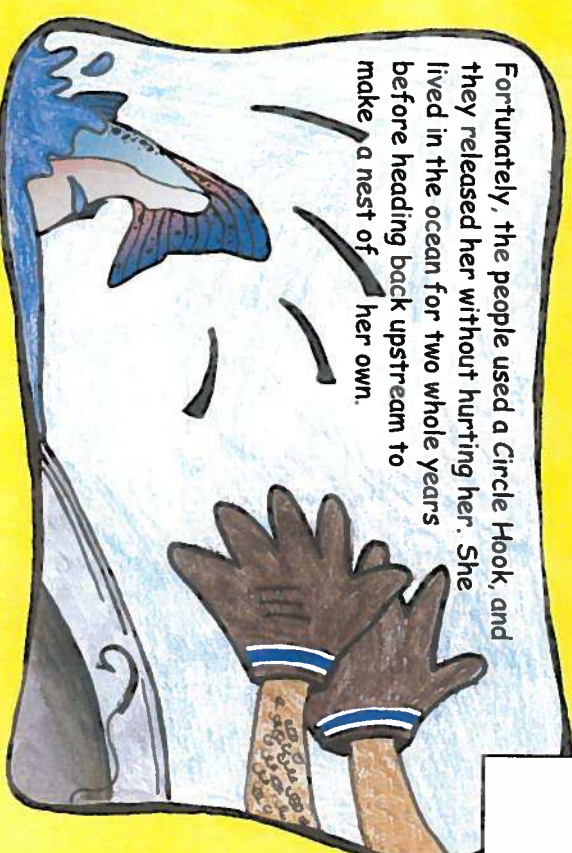
Unfortunately, when Flo was still really young, a nearby town had storm drains on its streets that emptied right into her stream.



Fortunately, schools put labels on the drains telling people not to dump pollution on the street. These labels kept the water clean, so Flo grew bigger and started to swim to the ocean.



Fortunately, the people used a Circle Hook, and they released her without hurting her. She lived in the ocean for two whole years before heading back upstream to make a nest of her own.





You Can be a Salmonid Saver!

CALIFORNIANS TAKE SO MUCH WATER OUT OF OUR RIVERS AND LAKES **Every Day** THAT IT WOULD FILL A SQUARE COLUMN OF WATER ONE FOOT WIDE FROM HERE TO THE MOON AND BACK AGAIN!



IF PEOPLE DON'T SHARE THE WATER WITH US, WE CAN GET LEFT HIGH AND DRY... WITHOUT ENOUGH WATER, WE CAN GET VERY SICK!



You can help! Guess how much water you can save by...

(Match each number with the correct sentence)

1. Turning off the faucet while you brush your teeth. Save _____ gallons per brushing.
2. Finding and fixing leaky toilets. (Put food dye in the tank, wait 15 minutes, and see if it turns your toilet water blue. If it does, you have a leak!) Save up to _____ gallons per year.
3. Taking a shorter shower. Save _____ gallons per minute.
4. Washing only full loads in your washing machine and dishwasher. Save _____ gallons per year.
5. Drinking a glass of water instead of a can of soda. Save _____ gallons per glass.
6. Using recycled paper instead of non-recycled paper. Save _____ gallons per ton of paper.
7. Using a broom to clean the driveway (not a hose.) Save _____ gallons in 5 minutes.
8. Washing your car with a bucket of water instead of a hose (or take it to a car wash that recycles their water). Save _____ gallons for a 15 minute wash.
9. Putting plastic bottles filled with water in your toilet tank. Save _____ gallons per flush.
10. Watering your lawn at night (instead of when the sun is out). Save up to _____ gallons per watering.

1
4
62
2,000
16.5
100
35
500
60,000
2
100

Most people use 160 gallons of water every day. That doesn't even include all of the water that we use to grow our food and to make things like paper, clothes, and cars. Be a Salmonid Saver, and use less water!

Protect Habitat!



CONSERVING WATER ISN'T THE ONLY THING YOU CAN DO TO PROTECT OUR HABITAT!

Gross out the letters Q, Z, X, and J to find out what else you can do to become a Salmonid Saver.

Xkejezp ozur qwzatzex cljezan! Javezid spzqilljijng gajsozline, goil, soqap jor zotxhejr pxollqutaznts zin tqhe waqtezr zor jon jlanxd.

Qpzcik jup lizttqer, zinqcludjijng zwojrn qlizne, jold hoxojks, qand jitraxasz txhazt zotqher pezopgle jdroqpped.

Zrejdugce hozw jmuzch yequ bquy, zrejuse zold cojintazingfers, jaznd grejcjyxcle toz saqvxe wajtqer xajnd jenexrgzy zanjid pxrejevqnt pxollqutziijon.

Qtajke thjex Eijthixcaql Aqngljier pljeqdgde tox bze grejspecxtfuql whxejn yjoqu' rxe fijixshiqng (www.boatus.com/angler/survey.htm)

Jtejll yjoqur fxrijenqds xajnd fijaxmqily hozw jthxey ccan hqejiip prjioxteqct saxlsmozn zand stjexelhqeazd hzabjirqat.



salmonids are anadromous



Did You Know?

In a nest of 3,000 salmon eggs, only two salmon will survive to lay eggs of their own.

The Redd

START
HERE
FINISH
HERE

You find lots
of gravel.

Skip ahead
to the redd
and lay
your eggs!

You found the
fish ladder!

Dead end!
A large dam is
in your way.

Go back 5 spaces
and try to find the
fish ladder.

Jump up
the ladder.

Lose a turn.

WELCOME
BACK

Someone cut trees
along the river.
The water gets
hotter and makes
it hard for
you to
breathe.

Directions:

1. Use pebbles as markers. Place markers on the REDD.
2. Flip a coin to see who goes first.
3. Take turns flipping the coin. Heads = move 2 spaces, Tails = move 3 spaces.
4. You must land on the fish ladder space to go up it.
5. Winner is the player to return to the REDD first to spawn (and die!)

Swim forward
4 spaces

Kids plant trees on stream bank
so water is cool and clean,
keeping you healthy.

START
OVER

A person fishing
stepped on your redd.

Take
another
turn

YUM! Mayflies
are your favorite
food.

Go back 2
spaces to
recover.

Yuck! Dog waste
in the river.

Spring rainstorm
makes you want
to move!

Swim
towards
the
ocean.
Move 1
space.

WELCOME
TO THE
OCEAN!

Lose 1 turn
while you
get used to
the salt
water.

Grow
bigger and
leap ahead
2 spaces!

River Cleanup Day!
People pick up litter.
You reach the ocean and find
a school of herring.

LITTER

Frolic
ahead
1 space.

Killer whales
in the water!

Lose 1 turn while
you hide.

Jump ahead
2 spaces.

Time to find
your home river!

Wiggle
back
3 spaces
to get
loose.
Yikes! Caught on a hook!