

CLASSROOM AQUARIUM EDUCATION PROGRAM FRY RELEASE FIELD TRIP GUIDE



INTRODUCTION

This guide was created so teachers, students, and volunteers participating in the Classroom Aquarium Education Program under the authorization of the California Department of Fish and Wildlife may experience a successful field trip releasing salmonids into the wild. It includes many easily led activities that engage students in their natural surroundings but don't require equipment, fisheries knowledge, or teaching experience to lead. Enjoy your day in nature!

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PREPARING FOR YOUR TRIP

DECIDE HOW YOU WILL ORGANIZE THE FIELD TRIP:

Stations: A great option for larger groups is to have several activity stations and have small groups of students rotate from station to station. This usually requires one person (teacher, parent or volunteer) to lead each station. If you don't release the fry as a group, fry release can be included as a station, with each group releasing a few fish.

Group Activities/Games: If you prefer to keep the group together, there are still plenty of options. Many games and activities can easily accommodate larger groups, and releasing the fry as a group can be very exciting.

See page 5 for sample schedules.

SOME THINGS TO KEEP IN MIND WHEN ORGANIZING YOUR TRIP:

- **Plan your release field trip about 4-5 weeks after the eggs hatch.**
- **Arrange for teacher's aids, parent volunteers, your principal, etc. to assist you.** If possible plan on one adult for every 10 students *in addition to the person leading the learning station*. More adults for younger students is always better. If you plan a fishing activity try to arrange for 1 adult per 4 students.
- **When you schedule the bus make sure they allow live fish.** If the fish are not allowed on the bus you will have to make arrangements for someone to transport the fish separately.
- **Notify your sponsor organization immediately of your field trip date & location,** and ask if they are available to assist with your field trip.
- **If you would like the Department of Fish and Wildlife to assist you with your field trip,** contact your local CAEP coordinator to check if staff is available.
- **Plan your activities,** organize a timeline, and have a plan if you get behind schedule (i.e. shorten activity times or skip last activity).
- **Visit your field trip site in advance to check the water temperature and facilities available.** Every site is different. Check for parking space, turn-around space for a bus, drinking water, restrooms and trash pick-up services so you can plan accordingly. Determine if site reservations are necessary.
- **Give assisting chaperones a job.** Making sure they know they have a role in the field trip will keep them engaged and discourage them from chatting amongst themselves.
- **Remind students ahead of time to dress appropriately.** Long pants, closed-toe walking shoes and clothes they aren't afraid to get dirty are good for field trips. Bring extra sunscreen along if it's sunny, and a large box of trash bags to use as ponchos if there's a chance of rain.
- **Don't forget the camera.** Recruit someone to be the field trip photographer/videographer.

Remember, prior preparation is a necessary component of a successful fry release field trip!

ON THE DAY OF YOUR TRIP

AT SCHOOL:

- **Review the rules of the field trip with the students.** Determine and share if there any special rules for the site you are visiting.
- **Divide your students into groups before you arrive at the field trip site.** This saves valuable time during your field trip. An easy way to differentiate between groups is to assign each group a color and give each student a sticker of their group color. The same can be done using types of fish, as well.
- **Don't forget the fish and thermometer! Collecting the fish can take a very long time—possibly an hour.** It helps to take the large rocks out, thoroughly sift through the pea gravel and check beneath the under-gravel filter so no fry get left behind. During transport check the temperature a few times. If the temperature begins rising, add a few ice cubes to keep the water cool. **Some sort of aeration is a good idea.** Gently pouring water from something such as a paper cup into the bucket should be sufficient, or you can use a battery operated aerator that can be attached to the side of the bucket. Placing the bucket in an ice chest with some ice in the bottom is a good way to maintain temperature and catch any water that may splash.
- **Make sure to keep your 772 permit with the fish during transport and release.** After the fish are released, complete the bottom section and return the signed permit to your CAEP coordinator or sponsor organization ASAP.

AT FIELD TRIP SITE:

- **Make sure your fish are acclimated for release.** Set the bucket in a shallow area of river or lake water and allow the temperature to slowly even out. You can add a cup of river or lake water every few minutes to help the process along. When the water in your bucket is the same temperature as the river or lake water (**less than a five degree difference**), you're ready to release your fry. This can take some time (about 20 minutes), but if you rush it you can shock or kill the fish.
- **While you're waiting for the water temperature to adjust,** have students observe the natural features of the river or lake and take the opportunity to discuss your fishes' new home with your students. Rivers and lakes are complex systems with many parts, each of which play a part in the salmonid life cycle. See the 'Parts of the River' page in this guide to identify some of these features and discuss their importance with your class.
- **Take time to explore the area.** A good idea is to devote at least 20 minutes to a nature walk or other activity that encourages students to interact with the environment. Divide the class into small groups (each led by a chaperone) and let them discover nature for themselves. The following pages of this guide include easy activities and games that can be led by anyone. Incorporating a few of these into a nature walk or free time challenges students to become actively engaged in the experience and to use all of their senses as they learn about the area.

SAMPLE SCHEDULES

STATIONS SCHEDULE

TIME	GROUP 1	GROUP 2	GROUP 3	GROUP 4
10:00-10:30	Arrival, River or Lake Talk & Fish Release			
10:35-11:05	Activity 1	Activity 2	Activity 3	Activity 4
11:10-11:40	Activity 2	Activity 3	Activity 4	Activity 1
11:45-12:15	Lunch			
12:15-12:25	Stewardship Reminder & Lunch Cleanup			
12:30-1:00	Activity 3	Activity 4	Activity 1	Activity 2
1:05-1:35	Activity 4	Activity 1	Activity 2	Activity 3
1:40-2:10	Group Game/Activity			
2:15-2:25	Cleanup and Loading			

Total time: Approximately 4 ½ hours, including time traveling between activities & general delays.

- Sample schedule with 4 groups works best with 30-80 students. For more than 80 students (>2 classes), consider adding a few extra activity stations & reducing the amount of time spent at each station. Try to keep each group to 20 students or less.
- 30 minutes is a good amount of time for most activities, but you can alter the timing of the schedule as you see fit.

GROUP SCHEDULE

TIME	ACTIVITY
10:00-10:30	Arrival, River or Lake Talk & Fish Release
10:35-11:05	Group Game/Activity
11:10-11:40	Lunch
11:40-11:50	Stewardship Reminder & Lunch Cleanup
11:55-12:25	Nature Walk
12:30-1:00	Group Game/Activity
1:05-1:15	Cleanup and Loading

Total time: Approximately 3 ½ hours, including time traveling between activities & general delays.

FIND A MATE

Group Size: Any even number of students (have an adult join in if necessary to make an even number)

Materials: None

Objective: Students will use their knowledge of wildlife and observational skills to imitate the behaviors of local animal species

This is a great game for younger students, encouraging them to explore what it's like to be an animal while developing their observational skills. Using the list of common animals below, secretly give each child an animal. Make sure to give each animal twice so that every child will have a 'mate'. If you have an odd number of students, you can either give three children the same animal or give yourself an animal and play along. With large groups, you can give the same animal to four students or come up with additional animals to have students imitate.

Tell each student that they're going to become their animal, imitating the movements, behaviors and sounds that animal makes. No human talking is allowed during game play. The object of the game is that, while imitating their animal, students will try to find their mate (the other student with the same animal). After they have found their mate, have students stop imitating the animal and wait until everyone has paired off. Ask each pair to reveal their animal, and check to make sure that all pairs are correctly matched.

Mountain Lion	Deer	Bear	Squirrel
Rabbit	Beaver	Coyote	Wild Boar
Hawk	Frog	Duck	Hummingbird
Trout	Owl	Mouse	Lizard

Conclusion: Ask students what types of things made it easy for them to identify their mates. Which animals were easily identified by sounds? Which animals were easily identified by movement? Which animals have you seen in the wild? If using the animals above, remind students that all the animals that they were imitating are native to California, and that conserving their native habitats is an important part of sharing our land.

FOUND ART

Group Size: Any

Materials: None

Objective: Students will explore natural items and creatively use them to make a piece of artwork

Creating 'found art' is an easy way to get children actively exploring natural areas, looking for unique and interesting items to contribute to a group project. Have students look for small, natural items that stand out to them. Leaves, flowers, interestingly shaped sticks and rocks, nuts and seeds are all good items for this project, but anything can be used. Before collecting these items, it's a good idea to have students point them out to you so you can check for any potential hazards (poison oak, broken glass, stinging nettles, etc.) and make sure that removing that item won't negatively affect the ecosystem. For instance, encourage students to take a petal from a flower rather than uprooting the whole plant.

For large groups, have each student find one object; for smaller groups have each student find two or three. After all students have found their objects (or at the end of your nature walk) find a flat surface and lay all of the items out. If you want, you can have each student say a few words about why they chose that item. Challenge the students to create a piece of artwork using as many of the objects as they can (using all of them is best!). Tell them they can make anything they'd like, and encourage them to find inspiration in their natural surroundings. They will not be using tape or glue to create their artwork; instead have them create their image by arranging the natural items on a flat surface. As this is a group exercise, you may have to remind students to work together and listen to everyone's ideas as they create their artwork.

Conclusion: Ask students how this exercise affected the way they view natural objects. What types of things would have been good additions to their artwork? Remind students that you're visitors to this natural area, and that all items must be left here.

Leave no trace: Remind students to return objects from nature to where they were originally found.

GIVE ME FIVE

Group Size: Small (1-10 students)

Materials: None

This basic 'categories' activity is quick and simple, requiring no materials or prior preparation. Simply come up with a category and ask students to "give you five" examples of things that fit.

Examples include:

- Give me 5 types of trees
- Give me 5 things that fly
- Give me 5 colors you can see right now
- Give me 5 types of insects
- Give me 5 facts about salmon or trout
- Give me 5 herbivores/carnivores
- Give me 5 predators of salmon or trout
- Give me 5 things that have 2 legs/4 legs/no legs
- Give me 5 things that are green/brown/blue

NATURE DETECTIVES

Group Size: Several small groups

Materials: 1 piece of blank paper, 1 unwrapped crayon per group (or student)

Objective: Students will use their observational skills to identify a natural object using a rubbing created by another group (or student)

'Nature detectives' challenges students to use analytical skills to determine which object was used to create a rubbing made by another group. Provide each group (or each student) a blank piece of paper and a crayon with the paper removed. Give the groups a few minutes to explore the area. During their exploration, have them find an interesting object (leaf, flower, bark, etc.) and make a rubbing of it. Encourage groups to think outside the box when finding their object, but remind them that the rubbing should be recognizable (for instance, a mushroom might fall apart during the rubbing process, making it difficult to identify).

After the set amount of 'exploration time' has passed, have the groups reassemble and trade rubbings with one another. Now give the groups the same amount of time to explore the area again, this time trying to identify what object made the rubbing they were given. When they think they have identified the object in the rubbing students can take a picture of it, identify and describe it, or show the group what they believe to be the original object. When the groups reassemble, have them find the group they switched with and check to see if their guess was correct. **Numbering the pieces of paper in advance can make this easier, as you can tell each group to remember the number of their rubbing.* If any groups guessed incorrectly, have the original artists show them the correct object.

Conclusion: Ask students what kind of clues they used to identify the object. Was it harder than they expected? Ask students to think about all of the different textures and shapes found in nature.

Leave no trace: Remind students to return objects from nature to where they were originally found.

RAINBOW ROCKS

Group Size: Any, works best with smaller groups

Materials: None

Objective: Students will use observational skills to find rocks and categorize them by color

Rainbow rocks is an easy way to encourage students to take a closer look at their surroundings by challenging them to find rocks in every color of the rainbow. Have students lay the rocks out by color, following the rainbow spectrum. Other options for practicing categorization skills include having students group the rocks by complementary/contrasting colors, or by patterns and textures.

Another variation of this activity is to have students decide on an image they'd like to create (fish, flower, butterfly, etc.) and then have them search for rocks in the colors needed to create this image. Have students work together to assemble the image.

Conclusion: Ask students why they think there are so many different colors of rocks. Explain that rocks are made of minerals, which give the rocks their color. Because one rock can be composed of multiple minerals, colors and patterns can vary greatly. Ask students to feel the rocks and try to determine what makes them smooth or jagged. Weathering and stream flow cause rocks to become smooth over time.

Leave no trace: Remind students to return objects from nature to where they were originally found.



Name: _____

SCAVENGER HUNT – USING ABC'S

Find something in nature that begins with each letter of the alphabet, and write your answers in the space provided.

A _____

N _____

B _____

O _____

C _____

P _____

D _____

Q _____

E _____

R _____

F _____

S _____

G _____

T _____

H _____

U _____

I _____

V _____

J _____

W _____

K _____

X _____

L _____

Y _____

M _____

Z _____

SCAVENGER HUNT – USING LIST

Find something in nature for each item listed below, and write your answers in the space provided.

- Two things that look similar but aren't the same
_____ & _____
- The highest place and the lowest place
_____ & _____
- Something that is constantly changing

- Something very old and something very young
_____ & _____
- Something that lives in a tree

- Something that lives underground

- Something that is naturally round

- Something that is naturally perfectly straight

- Something camouflaged

- Something that feels different than it looks

- Somewhere an animal lives

- Something that floats

- Something that eats plants and something that eats animals

- Something left behind by an animal

Name: _____

SCAVENGER HUNT – USING PHOTOS

Animal Tracks



Litter



A Pinecone (or seed pod)



A Chewed Leaf



A Mushroom



A Spiderweb



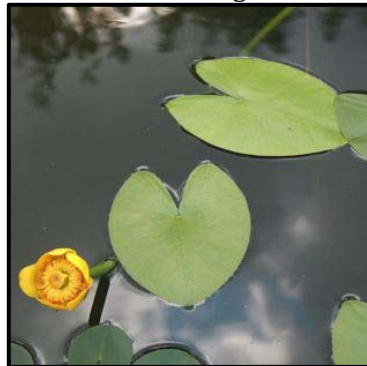
A Flower



A Flying Bird



A Plant Growing in Water



Exposed Roots



A Crawling Insect



A Mammal



SELF-GUIDED NATURE WALK

Group Size: Any

Materials: None

Objective: Students will engage their senses while exploring a natural area

Nature walks are a great way to connect students with their surroundings and introduce them to natural environments. While you're on your nature walk, there are a few easy things you can do to encourage students to engage their senses in their exploration of the area.

- Find an open area where you can stop your group without blocking the trail. Have students stand silently, listening to the sounds of the natural environment. Ask students to count the number of different noises they hear. After a full minute of listening, have the students tell you what they heard. What noises were natural? What noises were made by humans?
- As you walk, have students look for signs that animals have been there. Tracks, scat (animal droppings), burrows, grazed vegetation and nests/dens are all good indicators of animal presence. Encourage students to look everywhere, and point out any signs they see. As a group, discuss what you see and guess what animal might have created it.
- Introduce students to the concept of decomposers. What happens to living organisms after they die? Why do they decompose? An easy way to remember decomposers is to use the acronym 'F.B.I.,' or fungus, bacteria and invertebrates (animals that do not have backbones). Ask students to look for signs that the 'F.B.I.' have been at work.
- Name a color and have students look for natural objects in that color. Have them find as many shades of that color as they can.

TROUT, BEAR, MOSQUITO

Group Size: Any, works best with at least 10 players

Materials: None

Objectives: Students will understand the concept of a food web and will simulate fluctuating predator-prey populations

This game, based on rock-paper-scissors, is a great way to get kids moving while reinforcing the concept of a food web. To begin, introduce the three characters and their associated hand motions. For 'trout,' move your hands as if they are flowing through water; make a claw shape with your hands and lift your arms above your head for 'bear'; put your hands together and point index fingers out from your nose for 'mosquito.' Have students practice making the motions a few times, and then ask them what each animal eats. The bear eats the trout, the trout eats the mosquito and the mosquito eats the bear.

Once the students are familiar with the motions and the concept of the game, divide them into two teams and designate a playing field. The playing field should have two safe zones (which can be designated by trees, picnic tables, asphalt, etc.) approximately 100 feet apart with a center line down the middle.

Each team now huddles and decides whether they want to be trout, bears or mosquitoes. All members of a team must be the same animal, so the entire group must come to an agreement. Once both teams have decided what animal they are going to be, have them line up facing each other along the center line. On the count of 3, each team makes the motion for and shouts out the name of the animal they have chosen. The losing team turns around and runs for their safe zone with the winning team chasing after them. Any member of the losing team tagged before reaching their safe zone is 'eaten' and becomes a member of the winning team.

The game continues until either everyone is on the same team, or until students are too tired to continue.

*One variation that eliminates the tag portion of the game is to have teams advance one stage of the trout life cycle each time they win. Especially useful for younger children, this still allows there to be an ultimate winner, but can help keep things more controlled. Both teams start as eggs with the goal of becoming spawning adults. Whichever team advances through all life cycle stages (egg, alevin, fry, smolt/juvenile, adult, spawner) first wins.

Conclusion: Ask students a few questions about how game play progressed. What happened as one team became bigger than the other? What would happen if this really occurred in nature (i.e. there were 20 bears and only 5 trout)? Remind students that food webs are complex systems with multiple predator-prey interactions, and that each animal plays an important part in maintaining a balanced system.

Fun fact: Mosquitos really do bite bears!

YOU'RE ONLY SAFE IF...

Group Size: Any

Materials: None

Objective: Students will be able to identify natural features and species

This game is a simple variation of tag that allows students to practice identifying natural features while playing a high paced game. To begin, find an area with a variety of tree species and distinguishing features (river rock, picnic tables, etc.). Gather the group and take a few minutes identifying any tree and plant species that you can. If you can only identify a few things, try to find an area that has several of those species present. Some basic illustrations of common California tree leaves can be found below.

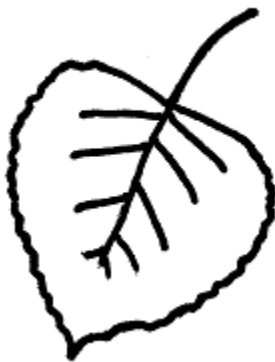
After the group has a basic understanding of the area, explain the rules of the game. Much like regular tag, one person will be 'it' and the others will try to avoid being tagged. The twist is that you'll be calling out 'safe zones' using the species and features you identified before the game. After you call out a safe zone the students will have to find and reach one of these features before they are tagged. For instance, if you're in an area with several maple trees you might call out "you're only safe if you're touching a maple tree!" Students touching any of the maple trees in the play area are considered safe. If a student misidentifies a tree, he or she can still be tagged. Any student that is tagged before reaching a safe zone then becomes 'it.'

While the goal of this game is to help students learn to identify natural features, feel free to include other objects as safe zones to keep the game moving and prevent students from staying in one area. Things like asphalt, picnic tables, signs and buildings can be used as safe zones to get kids moving away from areas with lots of plants and keep the game fair for the student that is 'it.'

Conclusion: Have the students ID some of the species that you used in the game, explaining what features they looked for to tell different species apart.



Maple



Cottonwood

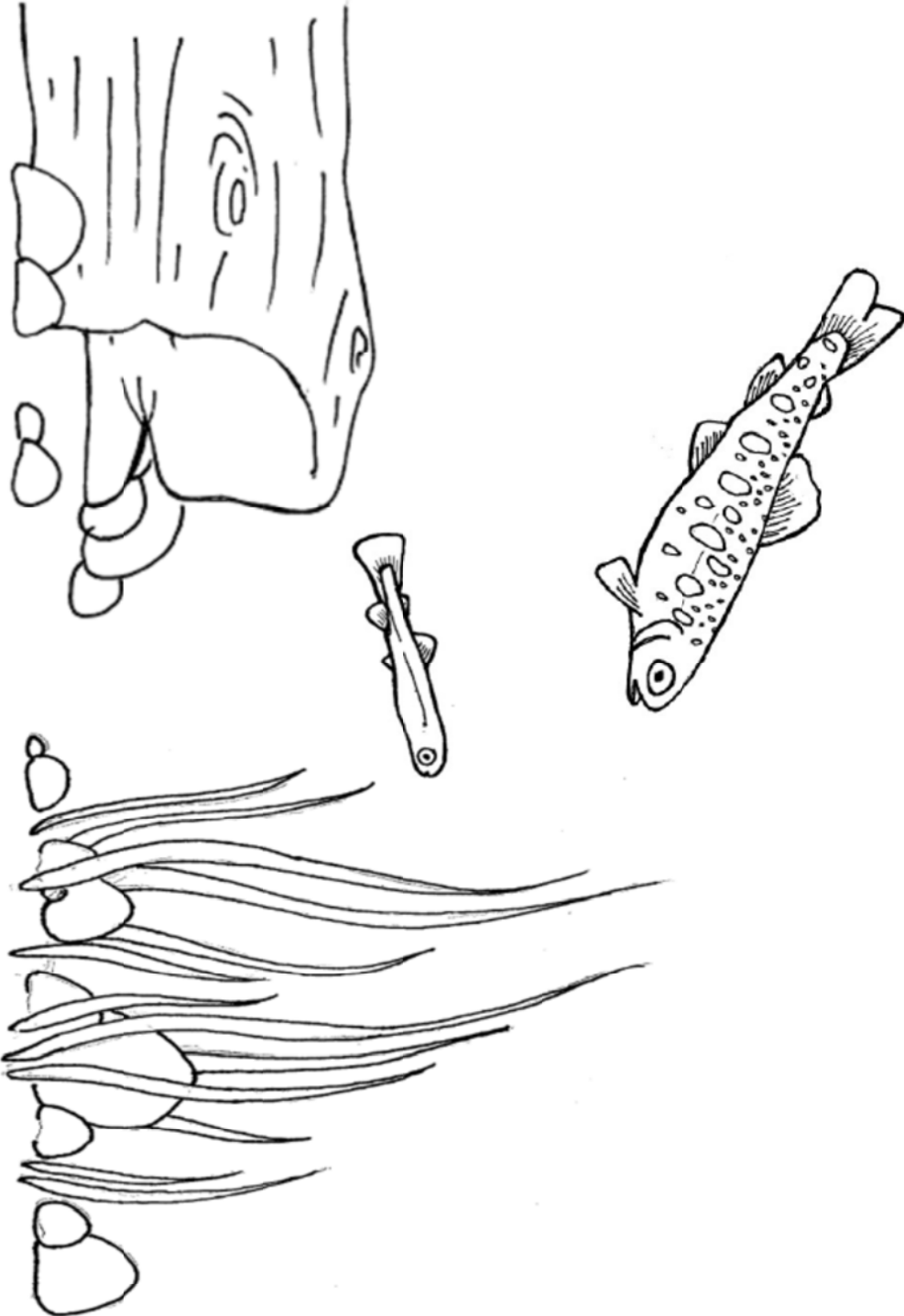


Sycamore

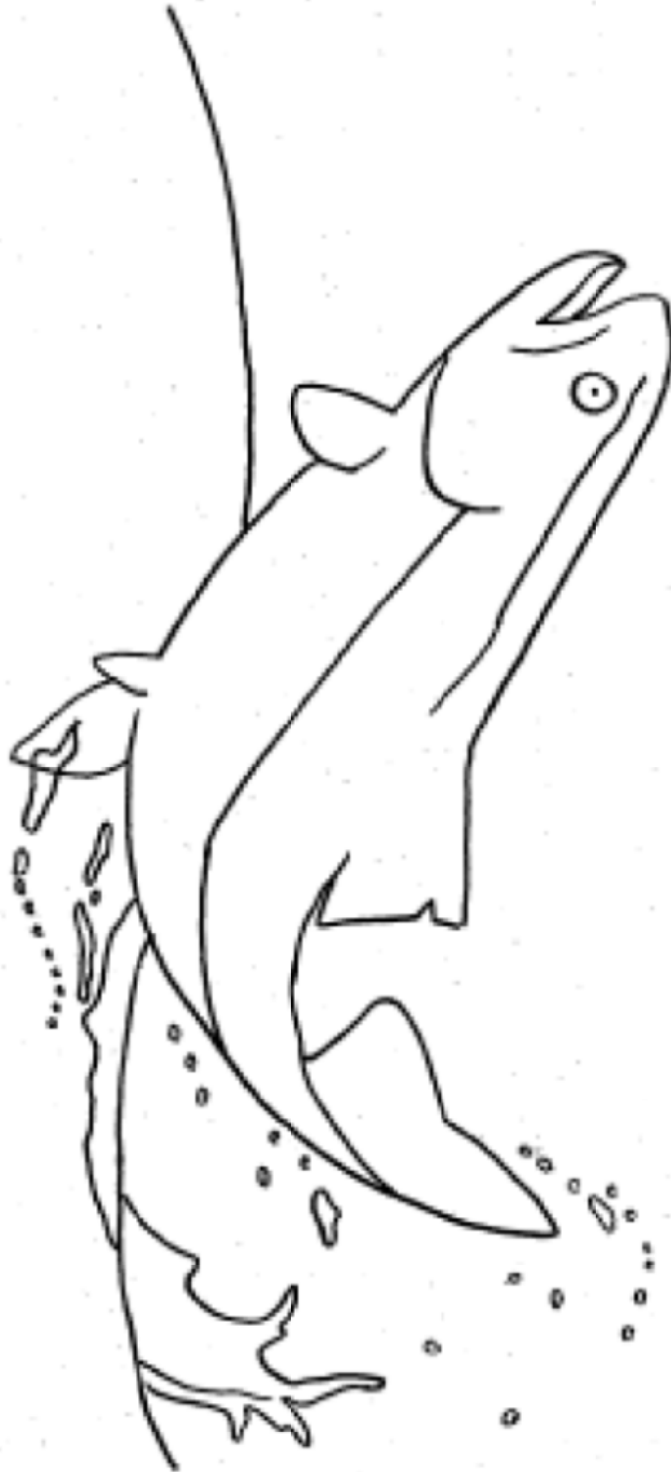


Willow

TROUT ART (1)



TROUT ART (2)



PARTS OF THE RIVER

Rivers are complex systems with many parts, each of which offers a unique habitat to the organisms living within them. Salmon and trout use these habitats throughout their lives, with each one serving a different purpose. While on your fry release field trip, identify the different parts of the river and discuss how your fish will use them with your students.

**Have students look for areas with white, choppy water.*

**Have students guess what is causing the water to look this way.*

RIFFLES

Key Physical Characteristics: White, choppy water.

Key Fish Usage: Spawning (laying eggs), egg and alevin development.

Benefits to Fish: High oxygen levels, insects (which are a food source for adults) protection for eggs and alevin.

Riffles are spots of shallow, fast moving water, usually flowing across cobble & boulders which creates a choppy appearance. As the water is disturbed by the substrate (rocks), oxygen is integrated with the water, creating bubbles and the white-ish appearance of the water. Salmon and trout usually lay their eggs near the end of riffles, close to the area where the surface of the water becomes smooth. Laying their eggs in the riffle ensures that eggs and alevin will receive enough oxygen to develop fully and provide shelter for eggs and developing alevin. Many of the insects which trout and salmon eat are found in riffles, making them an excellent place for adult fish to find food.

**Have students look for areas with deep, calm water.*

**Have students identify causes for the water to have slowed down in these areas.*

POOLS

Key Physical Characteristics: Smooth, slow moving water.

Key Fish Usage: Resting and feeding areas for fry and adults.

Benefits to Fish: Cover and shade, cool water, low velocity, insects (which are a food source for fry).

Pools are areas of deeper, slower water often found above and below riffles, around stream bends or obstructions like logs, root wads or boulders. Surface water is generally smooth, with little disturbance, and may appear darker than surrounding areas. Organic matter washes downstream and settles in pools, attracting invertebrates. Fry and adult salmon and trout use pools as places to rest and find cover while they wait for drifting insects.

**Have students look for an area with a smooth surface.*

RUNS

Runs are areas of smooth, swift flowing water, often found between riffles and pools. They are deeper than riffles, with a slower moving current, making them a good place for fry and adults to rest while waiting for food to float downstream.

Key Physical Characteristics:

Smooth, flowing water.

Key Fish Usage: Resting and feeding areas.

**Have students look for plants that are growing in the river or stream.*

**Have students hypothesize where submerged plants might be.*

AQUATIC VEGETATION

Key Physical Characteristics: Slower moving water, smooth/slightly turbid, vegetation visible.

Key Fish Usage: Cover for fry and small adults.

Benefits to Fish: Cover, insects (which are a food source for fry).

Aquatic vegetation consists of plants that grow within the river (also known as macrophytes) and plays an important part in keeping aquatic ecosystems balanced, providing habitat for aquatic insects and crustaceans and cover for fry and small adults. Macrophytes can be submerged, emergent or floating and include flowering plants, ferns, mosses and algae. These plants soak up pollutants from contaminated water, recycle nutrients and help maintain clear, healthy waterways.

**Have students look for plants growing along the banks of the river.*

**Have students look for trees which may have root systems that extend into the river.*

RIPARIAN VEGETATION

Riparian vegetation along the banks of a river or stream serves many functions. Overhanging vegetation provides shade to help keep water temperatures cool and creates habitat for non-aquatic insects which may fall into the water and become food for fish. Complex root systems along the bank help control erosion and absorb pollutants that would otherwise enter the river. As these plants die or are uprooted, their trunks, branches and root systems fall into the water and help create diverse habitat for fish of all sizes.

Key Physical Characteristics:

Vegetative growth along riverbanks.

Benefits to Fish: Cover and shade, potential habitat, insects (which are a food source for fry and adults).

PUTTING STEWARDSHIP & SAFETY FIRST

For many students, fry release field trips are a unique opportunity to experience the aquatic ecosystems of California. When you're on your field trip, take a moment to go over some basic stewardship and safety information with your students.

STEWARDSHIP TALKING POINTS:

- **Be respectful of the area.** This natural area is home to many plants and animals, even if they aren't visible right now.
- **"Take only pictures, leave only footprints."**
- **Clean up after yourselves.** Littering is harmful to plants and wildlife, and it only takes a minute to clean up after each activity.
- **Everything in nature has a function.** If students pick up a natural item during the day, remind them to put it back where they found it.
- **Handle living things with care.** If you're doing an activity where you'll be working with live organisms (i.e. Aquatic Insects), be gentle and considerate of the organisms at all times & return them to where you collected them before the end of the day.

SAFETY TALKING POINTS:

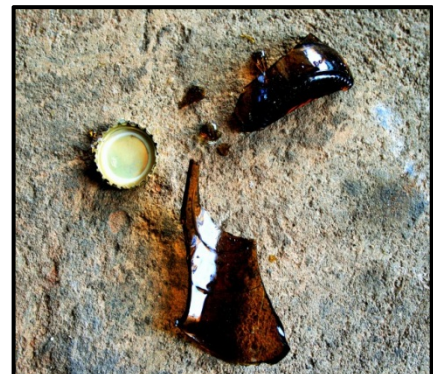
- **Stay with your group at all times.**
- **Be cautious of litter that is already on site.** There could be dangerous items like broken glass, hypodermic needles and rusted metal. Remind students not to touch litter which is already there, as it could be dangerous.
- **Be cautious of plants that contain skin irritants.** Poison oak and stinging nettle are two plants that will cause skin irritation or rashes and are common in California. The stems of poison oak plants can cause irritation even if leaves are not present.
- **Stay out of the river/lake.** Talk to students about water safety, drowning hazards and the possibility of harmful objects (broken glass, fishing hooks, etc.) in the water.
- **Don't drink the water!** River & lake water is not treated, and is not safe to drink.



Poison Oak



Stinging Nettle



Broken Glass