

## Trout in the Classroom: River Ridge Ranch/WildPlaces/Sequoia Riverlands Trust

Teacher's Manual v 1.0 (January 2012)

### Mission Statement:

"We will provide outdoor education that is based upon a watershed theme, addresses the state curriculum standards and instills in the student a critical understanding of place, process and pattern."

### Basic Program

The River Ridge Ranch Trout in the Classroom program will consist of five learning modules that are provided on-site and one module provided by the classroom instructor, aides, parents and docents. The maximum number of students shall be 72 to insure a maximum pupil-to-teacher ratio of 12:1. The program will integrate science, art and writing in a natural setting. Our intended audience is fourth through sixth-graders who are participating in the Trout in the Classroom program, although any class could benefit from a site visit without trout to release. Our program is taught with the assistance of WildPlaces and Sequoia Riverlands Trust.

Three primary areas of emphasis will recur throughout the day. These are watershed, water cycle (hydrological cycle) and river ecology.

Three characters of 'healthy' rivers will be repeated: Cold, Clear, Connected, Complex

### Overview of the Schedule

NOTE: The program runs on Mondays, Tuesday and Wednesdays only.

School buses will be met in our upper parking lot and lunches, trout and equipment will be unloaded and transported for you. There will be a brief huddle with all adults and the ranch owner.

Children will be led in their pre-assigned groups to the lower parking lot where they will participate in a 5' introduction and safety briefing.

If adequate trout are available, each group will release some trout during its turn at Turtle Cove. If only a small number of trout is on-hand, we will provide a group release session so that all students can participate.

Six pre-assigned groups (please divide your students into six equal groups and assign each group a number/color/animal/plant name, etc., and an adult.) will each meet their leader and then move to their starting rotations, following the map that is attached to this Manual. Please make copies of this map and distribute to all adults in advance of arrival. They will spend the entire day with the same leader except for during lunch and the teacher-provided module.

The five learning modules we provide are in the Appendix to this document and are:

- 1) [Nature Trail](#)- a guided walk that emphasizes our themes.
- 2) [The Long Haul](#)- a water conservation and water appreciation group game.
- 3) [Trout Release and River Ecology](#)- emphasizing cold, clear, complex and connected.
- 4) [South River Walk](#)- guided walk to Shaman Cove and exploration of skulls of animals found on the ranch and that use the river.
- 5) **Found Art**- a hands-on creative exercise using on-site, natural materials.
- 6) **Journal** (teacher-provided). Please prepare a writing exercise that dovetails with our themes and occupies the full 30 minutes.

There will be three rotations before lunch, each one lasting 30 minutes. Lunch is scheduled for ½ hour. During lunch we will teach students about recycling and ask that each table clean up thoroughly.

At the end of the day, everyone will reassemble at the Ephemeral Art site for a group picture and to allow all students to see the final result. Following the group picture, adults will lead their pre-assigned groups back to the bus. Our schedule is designed to get you back to your school on time. We will email you a file of the final picture.

## Welcome to the North Loop Nature Trail

What is the elevation (define, if necessary) of your home town? Answer: we will know this in advance, but valley floor towns are generally around 500' above sea level. Nature Trail is around 1,000' and Mt. Whitney is around 14,000'.

What is the highest point around you? [Answer: 3,000' above sea level].

Anyone know the name of these mountains? Answer: Sierra Nevada [Spanish: Sierra= mountain range; Nevada=snowy]

### **1) First stop: Bridge over the channel**

### **2) Second Stop: Dennison Lookout**

### **3) Third Stop: Embankment**

### **4) Fourth Stop: Fern Grotto**

As you enter through the arch, point out an oak tree. What is the California state tree (redwood). Some people think it ought to be an oak.

### **#1) Bridge over the small channel.**

Imagine water up to your knees flowing here and over the rounded boulders that dot this seasonal stream channel. Is water running now or can you find evidence of water having flowed here? These channels provide natural flood control as the water slows down and percolates into the soil. This is one of the reasons not to build structures too close to waterways. Even though surface water might not be running, moisture-loving plants thrive here, such as the Button Willow. The Yokuts people used the straight shoots of this plant to make arrow shafts. Look carefully at its base to see any wild-flowers that might be growing in its shade.

### Turn east and find the large oak tree.

Above you towers the Valley Oak draped with a California Wild Grape vine. This kind of tree and vine were probably around here hundreds or thousands of years ago: It is an ancient scene of the oak-dotted river corridors once common in the Central Valley- that is, down on the valley floor near where you live (anyone know the Kaweah Oaks Preserve in Visalia or Mooney Grove Park?) Now, that area is mostly agriculture and cities. Valley oaks are water-loving species and are not as arid-adapted as the blue and live oaks found on the hillsides. What kind of animals do you imagine eat the grapes that are on the vine? (Quail, turkey and other birds, black bear, tree squirrels). What is the fruit of the oak? (Acorn) What else is there to eat around here?

## **#2) Dennison Lookout**

Walk past the sign labeled #2 (California Redbud) into the open and face North.

View of Dennison Peak at 6,000'- Snow visible? Can you hear the main channel of the river? Cup your hands behind your ears, face east, close your eyes and listen to the soothing voice of the Tule.

This is a good opportunity to review the Water (Hydrologic) Cycle: Precipitation, Runoff/Percolation, Evaporation.

Follow the sign to continue left on the trail, through the funky gate and stop midway between the big sycamore tree on your left and the big sycamore tree ahead of you.

Turn around and look up into the Sycamore tree. Can you find the Barn Owl nesting box?

Continue up the rise to the big Sycamore and fan out to the left, looking down at the river.

## **#3 Embankment**

This steep bank overlooking the Tule River wasn't always here. How did it form? How did this valley form? Look for and point out Wood Duck Nesting Box.

On the way to the next stop, stop at the sign Incense Cedar. Have the group find the tree. Does it look kind of like a Christmas tree? Do you think it is usually found at this elevation?

How might it have reached here? {The Tule river has brought down seeds from higher elevations where Incense Cedars usually live (above 4,000'). This cedar has probably grown from such a transported seed.}

Next, on your right, look for the Poison Oak sign. Discuss characters of plants like this: defense against predators (herbivores). Oily appearance (irritant oil), three leaves in a cluster (Leaves of Three- Let it Be), red/brown stems.

Bear right at Turtle cove sign; mention that this is the trout release spot or ask if they've already released their trout?

**#4) Enter the Fern Grotto** and visit wild roses, mint, native blackberry and a forest of White Alder. Smile at the eyes on the smooth, gray bark of the alder. Notice the different size classes of alders; lots of young and some dying and decaying elders. These are short-lives species that like to have their roots right in the water. It's hazardous living! The fountaining green clumps are Santa Barbara sedge or white root. The Yokuts used these for basket materials.

Exit the Fern Grotto by backtracking and hanging a left to the River Barn. This is the site of the Writing module.

After the writing, go north toward the storage shed and back on to the Nature Trail toward the river. Stop before the rise to the Sycamore Tree and on the left is the Found Art area.

## The Long Haul

### Objective:

1. Students will work in a team-building exercise
2. Students learn that water accessibility can lead to overuse
3. Students develop an appreciation of volumes of water
4. Students will develop an appreciation of how we have it much easier than generations before us

### Making Connections- 10'

Students will gain a better understanding of daily water consumption and how we have made water easily available.

Example: Explain that each time you flush the toilet it takes 1 1/2 gallons of water. Have students pump 1 1/2 gallons of water into a bucket, and then ask them how often they flush the toilet a day. Then, expand it to family members, for instance if they are a family of four and they each use the bathroom four times a day. That is 4 people x 4 flushes a day = 16 flushes x 1.5 gallons of water = 24 gallons a day for flushing.

Later in the exercise you will give them the challenge of hauling 24 gallons of water in ten minutes. They will pump in a container and let's see if they make their goal.

### Background

Discuss how in most modern societies water is easily available at the turn of the tap. Engage students in a discussion of how our homes are plumbed with pipes that deliver water and transport sewage away and how this has made using water extremely easy. Have the students discuss what their daily water use.

List the ways in which they say they use water.

Then, discuss how less than a hundred years ago many people had to pump and haul their own water for cooking, drinking, washing, caring for animals, and other needs.

People also sometimes had to walk long distances to fetch the water. Let the students know that water is not available to everyone as it is here. Many parts of the world as well as North America do not have running water.

Average household consumes an estimated 200-600 gallons of water per day.

## **Warm Up**

1. Have the students discuss ways they use water?
2. Do they know where their local water comes from?
3. Discuss what they do after school and see how much free time they have to pump and haul their family's water.

## **Activity- 10'**

1. Explain to the students they are going to play a water hauling game. Show them the water pump, buckets, the length of the course to the cottonwood tree tied with a ribbon, and the pails they are going to fill with one gallon each.
2. The students will be divided into two teams. You also need one or two students to pump the water, depending upon group size. Keep the teams equal size.
3. Let them know that it will be a bucket brigade, like people used to use for putting out fires . Have them line up, then they will pass the bucket down the line to the end of the road and water the tree. Once they have dumped the bucket, the last student runs the empty bucket back to be filled again. Continue and the two teams water the next closest tree. The leader keeps a tally of the amount of water each team hauls.

## **Wrap up- 10'**

1. Discuss the results; how much effort it took to pump and carry how many gallons.
2. How did they feel about the activity?
3. Discuss reasons why we use more water now in 2012, than we did 1912.
4. Discuss ways we can conserve water.

## River Ecology and Trout Release Module: Turtle Cove

### Materials Needed:

Laminated Map

Dry Erase Markers

Tripod/Easel

Poster board with regular Markers

Thermometers

Bucket with Trout

Optional: Dip Net & Enamel Pan

### **Task #1: Temperature – Explore the River. 5'**

Ask students,

“What was the temperature in your trout aquarium?” Write it on the board.

“What do you **guess** the water temperature is in degrees Fahrenheit?” You could have them stand in groups of different temperatures.

Write it on the board.

Have students go to the edge of the river and dip hands in the water. “What do you guess is the temperature in Fahrenheit?” Write in on the board.

Have two students take the water temperature and write it on the board. Compare with the guesses. Remember: Cold, Clear, Complex, Connected.

### **Task #2: Release the allotted number of trout hatchlings into the edge of the river. 5'**

Use the cup to dip up some trout and release carefully into shallow water at bank. Be sure all students can see this. Make sure to keep at least one for each group. You may choose a couple of students to release the trout, or just do it yourself.

### **Task #3: Discussion and Activity: “A River Ecosystem...” 10’**

Go back up the trail and have students each pick a boulder and stand on it. [“Pick a safe one.”] Tell them to get a good view of the river.

Ask them, “Where is **upstream**?” “Where is **downstream**?”

Look upstream. “What color is the water?” (Answer: white). Why? (Answer: air is dissolving in the water as it flows over the rocks). This is called a **riffle**. Ask them, “Why is this good for trout?” (Answer: air contains oxygen and trout are active animals that require a lot of oxygen).

Point to the area between the riffle and Turtle Cove. “This is called the **run**.”

Point to Turtle Cove. “This is called the **pool**.” So, the river has a structure: Fast/shallow, medium depth/medium speed, slow/deep.

Ask, “What are some differences you can see between the riffle and the pool?” [Hint: Have students look at the Turtle Cove pool and describe it physically: depth, speed, shade, oxygen, bank vegetation]

Ask, “What kinds of plants do you see?” Answer: Trees, shrubs, herbs and grasses.

Ask, “How much shade is in the pool? How much sunlight?” What causes the shade? How might it affect water temperature?

Ask, “What sources of food are there?” Answer: Upstream, overhead, hatchings.

Ask, “What sources of **oxygen** are there?” Answer: Air interface/boundary, riffles/mixing.

Ask, “What kind of **shelter** will the fish use?: Answer: It depends upon their age:

Ask, “Do you think this is good habitat for trout?”

Pee and Poop: Point to the pastures on the other bank and mention that this is a working cattle ranch. What are those cows doing all day? What are their wastes and where are they going? What are the effects on the river and the downstream users?

This River is an Ecosystem. It is made out of **living** and **non-living** components. We have discussed all of the different components and how they relate to each other.

California Science Standards: Grade 4 - Life Sciences 2b, 3a, b, 5c, 6 a - f, Grade 5 – Life Sciences: 2b, 3e, 6 a – g.

### **Task #4: Find your location on the maps; envision the Hydrological or Water Cycle. 10’**

Have a student take a dry erase marker and go to the map board. Have the other students direct him/her to their city. Circle it. Find Springville. Circle it. Find the Sierra summit. Circle them. Trace the river to River Ridge and the valley floor, discussing precipitation, runoff, percolation and water table along the way. Opportunity to bring in water quality and pollution and conservation practices. Discuss Watersheds.

## Shaman Cove “Bones” Module

Students walk a trail along the Tule River to a granite outcrop that forms bedrock in the river bottom **10'**

Students encounter four stations of animal skulls and are asked to engage in a rapid-fire round of question-answers while handling the bones **10'**

**1) Cougar skull**

**2) Coyote skull**

**3) Cow skull**

**4) Duck skull**

What animal do you think this is?

What do you think it eats?

Why do you think so?

Each round is about two minutes, followed by a docent-led group discussion that both answers the questions posed and explores relationships of these animals, all found here, to the river and its care and management.

**10'** to walk back to The Long Haul.