

Where are the Salmonids?

Respect Rule: Look, Listen, Learn, and Leave Alone (until instructed).

Overview

For thousands of years salmonids have migrated from the ocean back to the rivers and streams of California to lay their eggs. However, during the last fifty years the salmonids population in California has declined due to habitat loss. “Impoundments, land-use activities, water development and diversions have changed virtually all the streams within this watershed, eliminating much of the historic spawning and rearing habitat. Dam construction and water diversion dried much of the San Joaquin River.” (U.S. Army Corps of Engineers) Fortunately, increased awareness has contributed to healthier river environments and by working together communities can restore a sustainable and healthy watershed.

Before-the-Field-Trip Activity

Activity: Plight of the Salmon

Time: 1 hour

Materials: Word Match-Up Student Worksheet and Answer Key, Key Words Student Worksheet, Plight of the Salmon Newsletter Activities: Finding Fish Facts, Migration and Its Challenges, Create a Salmonid Life Cycle, *Plight of the Salmon* newsletter

1. Distribute the Word Match-Up Student Worksheet as a pre-assessment. Remind students this is not a graded test, but rather a measure of success; each student will re-take the same assessment after the field trip experience. (Note: Save these completed assessments and redistribute after the field experience. Students can change their answers based on what they have learned.)
2. Distribute *Plight of the Salmon* newsletter to each student. Students can work in teams. Teams may be used on the field experience, as well as pairs or individuals, to complete the reading of the newsletter.

3. Assign each student one of the three student worksheet activities: Finding Fish Facts, Migration and Its Challenges, Create a Salmonid Life Cycle. Have students complete worksheets using the Key Words Student Worksheet.
4. Review students' answers and relate these concepts to lessons already covered.

Field Trip Activity

Activity: Tour Salmon Habitat

Time: 1 Hour

Materials: None

1. Tour the habitat of the salmon or trout and/or hatchery.
2. Encourage students to ask questions.

After-the-Field-Trip Activity

Activity: Evaluate Your Perception

Time: 1 Hour

Materials: Key Word Match-Up Student Worksheet from the Before-the-Field Trip Activity

1. Distribute Key Word Match-Up Worksheet and have students complete as a post-assessment.
2. Discuss prior knowledge compared with present knowledge of the plight of the salmonids. What misconceptions were present prior to this study? How is this new knowledge going to make them better stewards of their environment?

Extensions

1. After learning about chinook salmon and steelhead, students can begin to brainstorm stewardship projects in their local areas for stream protection.
2. Students can create life-cycle mobiles of the salmon to understand habitat requirements at all stages of life for anadromous fish.



Objectives

Students will use the *Plight of the Salmon* newsletter to complete several activity sheets as background information for their study of fish population issues, habitat requirements, life cycle and stewardship projects.

Grade Level

5–8

Adult/Student Ratio

Full class (student teams)

Where

Before and After the Field Trip lessons in the classroom; Field Trip in November–December below the reservoirs of major rivers, or a fish hatchery

Skills

Reading comprehension, discussing, observing, drawing conclusions, cooperative problem solving, recording

Key Words

Adaptation, Alevin, Anadromous, Ecosystem, Estuary, Fry, Habitat, Migrate, Redd, Riparian, Salmonid, Smolt, Spawn, Stewardship, Terrestrial, Tributary, Watershed

3. Students can create life-sized drawings of the chinook salmon and steelhead trout to illustrate the differences in size and appearance of each species.
4. Students can conduct an investigation of other threatened or endangered salmon species. Compare and contrast the challenges and behaviors that need to be addressed to conserve these species.

Source

Adapted with permission from:

New Hogan Lake Monitoring Stream Health education guide, Tricia Corsetti, Tomales Middle School, Christie Denzel Anastasia, National Park Service.

Key Word Match-Up

Student Worksheet (Pre- and Post-Assessment)

Draw connecting lines between words and their definitions.

Estuary	a smaller stream or river that flows into another larger stream or river
Riparian	the mouth of a river where fresh and salt water mix
Tributary	the land that serves as a drainage for specific streams or rivers
Watershed	the land and living things that are right next to a stream or a river

Species Challenges

Circle the factors below that have contributed to decline of chinook salmon and steelhead trout in California.

Development	Improved water quality	Fencing off streams on agricultural lands
Streamside restoration	Low reproductive rates	
Logging	Dam construction	Unevenly distributed fish sex ratios
Conserving water use	Prolonged drought	

True or False?

- T F Chinook salmon and steelhead trout can weigh over twenty pounds.
- T F Chinook salmon can only live in salt water.
- T F Steelhead trout can only live in fresh water.

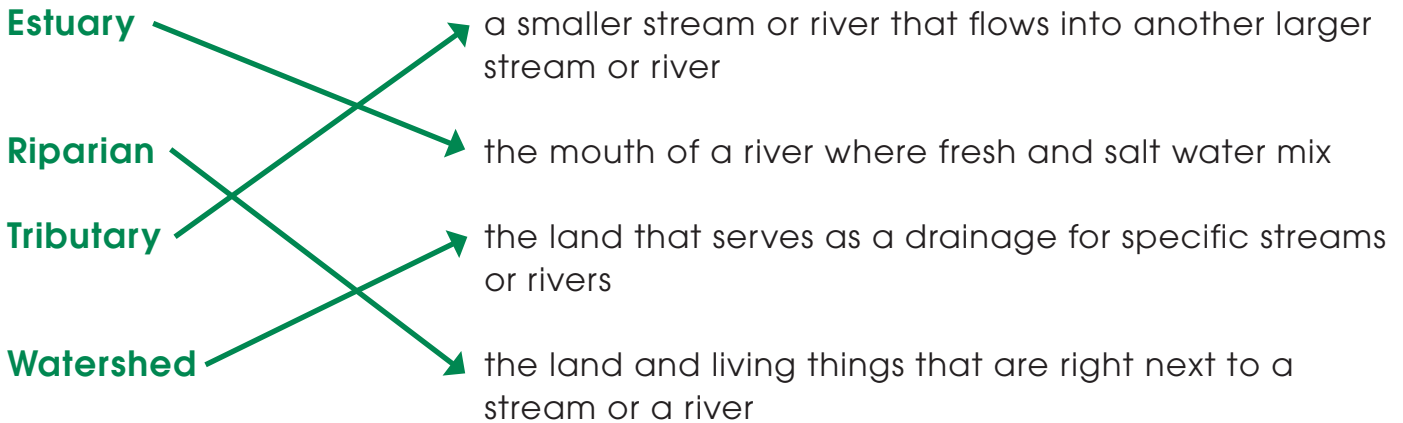
Stewardship

What can you do to increase chinook salmon and steelhead trout population numbers? List your ideas on the back of this paper.

Key Word Match-Up

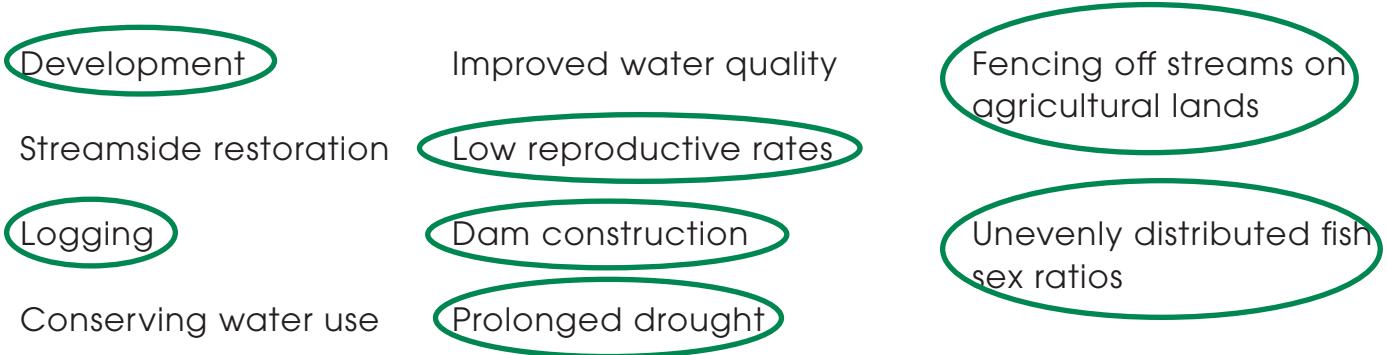
Answer Key

Draw connecting lines between words and their definitions.



Species Challenges

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Stewardship

What can you do to increase chinook salmon and steelhead trout population numbers? List your ideas on the back of this paper. *Answers will vary.*

Key Words

Student Worksheet

Adaptation: adjustment or change in an organism to become suitable to a new situation.

Alevin: the yolk-sac stage of salmonids.

Anadromous: describes fishes that begin life in fresh water, then go to the ocean to live, and finally return to fresh water to spawn (derived from Greek; means running upward).

Ecosystem: a community of interrelated life forms and non-living physical parts.

Estuary: the mouth of a river where fresh and salt water mix.

Fry: a young, immature salmon or steelhead that has not smolted yet.

Habitat: the native environment of a plant or animal; the kind of place that is natural for the life and growth of a plant or animal.

Migrate: to physically move from one region to another depending on seasons; salmon hatch in fresh water, migrate to sea, and spawners migrate back again to fresh water.

Redd: a nest that a female salmon or steelhead digs with her tail in the gravel and a place where her eggs are deposited.

Riparian: a zone that links terrestrial and aquatic systems.

Salmonid: of or belonging to the family Salmonidae, which includes salmon, trout, and whitefish.

Smolt: a young salmonid adapting to life in the ocean environment.

Spawn: to produce young or eggs, especially in large numbers.

Stewardship: choices and actions to protect the environment.

Terrestrial: living or growing on land, not aquatic.

Tributary: a smaller stream or river that flows into another larger stream or river.

Watershed: the land that serves as drainage for specific streams or rivers.

Migration and its Challenges

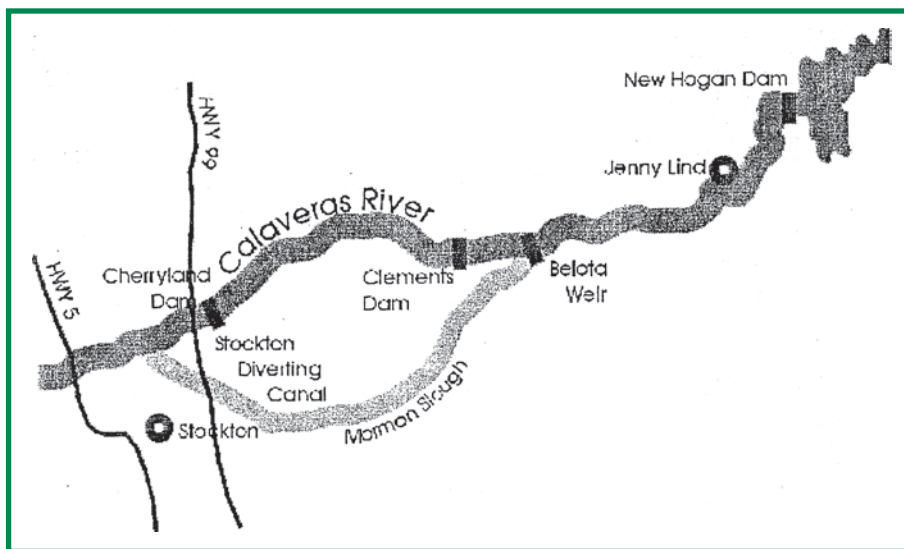
Plight of the Salmon Newsletter Activity

Using the map below, draw a path of the chinook salmon and steelhead trout migration routes.

List at least two threats along the migration route on the appropriate map locations.

Using a different color, label human interventions in the same way.

Salmon and Steelhead Migration Routes



Finding Fish Facts

Plight of the Salmon Newsletter Activity

Using the newsletter as the resource, answer the following questions about Chinook Salmon and Steelhead.

What are three similarities and three differences between Chinook Salmon and Steelhead Trout?

Similarities

Differences

List two routes fish can take up the Calaveras River.

Name two different populations of Chinook Salmon?

List five threats to salmon habitat.

List five stewardship or conservation activities we can implement to remedy these threats.

Name _____

Date _____

Finding Fish Facts

Plight of the Salmon Newsletter Activity (continued)

What are five objectives of the restoration project?

Name at least three creek barriers to fish migration, mentioned in the article.

What is the federal status of the Chinook Salmon and Steelhead Trout? What does that mean to the Corps of Engineers?

Bonus

Indicate by name where Chinook Salmon and Steelhead Trout are scientifically similar.

	Chinook Salmon	Steelhead Trout
Kingdom	_____	_____
Phylum	_____	_____
Subphylum	_____	_____
Class	_____	_____
Order	_____	_____
Family	_____	_____
Genus	_____	_____
Species	_____	_____

Create a Salmonid Life Cycle

Plight of the Salmon Newsletter Activity

- Using the *Plight of the Salmon* newsletter, gather the following information to create a life-cycle chart. (Choose either the Chinook Salmon or the Steelhead Trout as an example to complete this activity.)

Elements of the Life Cycle	Fresh or salt	Month, Season or Weather Conditions	Time involved
<i>Example: Female digs a series of shallow nests</i>	<i>Fresh</i>	<i>Winter</i>	<i>Several weeks</i>

Create a Salmonid Life Cycle

Plight of the Salmon Newsletter Activity (continued)

2. What are the benefits and disadvantages of being anadromous? Brainstorm as many ideas as you can think of before conducting additional research. Chances are your creative and logical ideas will be the same as you will find with further research.

Benefits	Disadvantages

3. Do the benefits outweigh the disadvantages?