9. Scripts

This chapter contains presentation scripts for every portion of the Kokanee Karnival program — Streamside, Hatchery, and Angling Clinic Experiences and Angler Education. Use the scripts as a guide when presenting information to students. Adjust the scripts to accommodate students' experience, attention span, grade level, and other factors. The scripts can be photocopied and used onsite.

Scripts – Streamside Experience

This section contains the following scripts for the Streamside Experience:

Scripts – Hatchery Experience

This section contains the following scripts for the Hatchery Experience:

[+] Titles courtesy of *Discovering Salmon: A Learning and Activity Book*, by Nancy Field and Sally Machlis, Dog-Eared Publications, Middleton, WI, and used with permission.

Scripts – Angling Clinic Experience

This section contains the following scripts for the Angling Clinic Experience:

Scripts – Angler Education

This section contains the following scripts for Angler Education:

Scripts – Streamside Experience

This section contains the following scripts for the Streamside Experience:

[+] Titles courtesy of *Discovering Salmon: A Learning and Activity Book*, by Nancy Field and Sally Machlis, Dog-Eared Publications, Middleton, WI, and used with permission.

Streamside Experience
Welcome

Good (morning/afternoon), my name is *volunteer's name*, and I'm with *organization's name*. I'm here to welcome you to Kokanee Karnival. This streamside activity is only one portion of Kokanee Karnival, and we hope you learn a lot from the various activities provided during the school year. Now, let's get started.

As you look around, you see the people who will teach the lessons at the different stations. Everyone is a volunteer, and these volunteers are here because they want to share their knowledge with you. We have volunteers from *organizations' names*, and they will introduce themselves at each station. Please thank them for their time and effort as you leave the stations.

If you look in this direction *point*, you will see Station 1. Nature's Restaurant[+]. At Nature's Restaurant, you will learn what kokanee eat, the role of different insects and predators, and what we can do to keep the water healthy for all the animals and insects that rely on the water.

Station 2. Comforts of Home[+] is over there *point*. At Comforts of Home, you will learn about fish habitat, what fish need to protect themselves from predators, and what we need to do to keep the streams a safe and healthy place for the fish.

Station 3. Incredible Journey[+] is over there *point*. Incredible Journey covers the life of the kokanee salmon and the problems kokanee salmon face, from the time the eggs are laid until they come back to spawn.

Raise your hand if you have any questions while at these stations. You will be called on to ask your question as soon as possible. Don't be afraid to ask a question. Much of what you hear today is new information, and that makes almost everybody ask questions.

We are guests in the animals' world while we are here, so we ask that you remember a few rules. You wouldn't want animals to come into your house and make a mess. If you see any trash, please pick it up and drop it in the garbage bag here at the trailer. We don't want to damage the animals' home, so please stay on the trail between the stations. There will be NO running because we don't want anyone to fall and get hurt. Finally, please don't kick dirt into the water. You'll learn why at the Incredible Journey station.

If you look up and see an eagle or osprey, or if you see a deer or other wildlife, let the group know about it so everyone can see it. That's why we are here, so you can see nature as it is supposed to be.

Bottled water is available right here *point* if you need it. If you need to use the restroom, it is over there *point*. You will have a few minutes between stations to get water or use the restroom. If you have to leave a station, let your parent guide know and take someone with you. That way, if you fall, there is someone to let us know. Again, please don't run.

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Location

We are located about here. *Indicate location on USFS map*. The stream we are using today is called Brown's Creek. This is a part of the Deschutes Basin watershed. *Refer to state of Oregon map for perspective.* The water you see flowing here is part of the water you see running through the middle of Bend as the Deschutes River. This basin includes Odell and Crescent Lakes, Elk Lake, Hosmer Lake, and all of the other lakes and streams in this area. *Indicate watershed area on map*. As you can see, Brown's Creek flows into Wickiup Reservoir and that is where the kokanee you see here in the creek live during other parts of the year.

The kokanee is a landlocked salmon that can't get to the ocean like other salmon do. Does anyone know why they can't get to the ocean? That's right, there are dams that stop them from traveling downstream, but there is something else that stops them from coming here if they could get to the ocean. Any ideas? How about Dillon and Benham Falls? Many of them wouldn't survive the travel over the falls on the way out, and none of them could swim back up the falls to spawn here. You'll learn more about all of that travel at the Incredible Journey and the Comforts of Home stations.

When you look at the map, you can see how the water flows from Little Lava Lake, down the Deschutes River to the Columbia River, and to the ocean. If I poured something into the water that shouldn't be there, like motor oil, how far could that spread and cause problems? That's right, all the way to the ocean. These are all things we must keep in mind when we are playing or working on, or in, the streams and lakes. You'll learn more about the effects oil and other toxins can have on the water at the stations. While we are talking about how the stream flows, let's walk over here where we can see the stream and look at the flow of the stream.

Observing Water Flow With Dye

NOTE: The use of flourisine dye to demonstrate water flow patterns is a graphic but optional activity. Consult with your local water quality monitoring staff about the availability of this dye for use in the demonstration.

When you look at a flowing stream, you see a few little waves on the surface, but it looks like it's actually smooth. You also expect the stream to flow at about the same rate from top to bottom, but it's surprisingly nothing like that.

In any given stream, you will find areas where the water moves fast, areas where it moves slow, and some areas where it stands still. All of these areas play an important role in the lives of the plants and animals that live in the water.

The faster moving areas, where the water splashes around, helps add dissolved oxygen to the water. The fish, the insects, and even some of the plants use the oxygen to stay alive. The oxygen in the water is used the same way you use the oxygen in the air you breathe. Some of the insects live in the faster water and gather the food drifting by.

Slower moving water provides a place for most insects to live without getting washed away and a place for fish to rest. You'll learn more about water flow and the part it plays at each station.

If you've never had a chance to see water in action, it's hard to tell exactly what it does. We have a way to make it easier to see the action of the water. *Volunteer's name* will put some special dye in the water so you can see how the water actually moves. Watch closely as the dye spreads, and you'll see some places where it goes downstream very fast. In other spots, you'll see the dye almost stop moving completely. *Watch the dye spread.*

Now that you have seen how the dye spreads with the current, you can see why the fish live in some areas, but not others. Where the water moves very slowly, or actually flows backward, fish can rest and wait for food to come to them. Fish have to work all the time to stay in one place in fast moving water. If a fish tried to live in the fast moving water, it would be like you running all day and all night, with no rest breaks. You couldn't even stop to eat.

The dye we are using is a special dye, so please don't try to do this with anything else. This dye has no effect on the fish, the insects, or anything else that lives in the water, and it will disappear completely in a short time. If you were to do this with milk, kool-aid, soda, motor oil, or anything else, it could cause serious damage to some of the organisms that live in the water and kill others. We'll add dye again, but this time I'll tell you what causes the different flows and where to look to see exactly how the water flows.

When *volunteer's name* puts the dye in the water watch by the log. You'll notice that the dye swirls around the end of the log and stays behind the log for a long time. That's an easy rest area for the fish. If you look at *point to area*, you will notice that the water slows, but there is nothing visible to block the flow. It slows here because there is a shallow dip in the bottom of the stream. The water flows over the dip, but then it flows back upstream on the bottom. If you look at *point to area*, you will notice the water moves through that area very fast. That's because there are no rocks or logs to slow the water. A fish swimming in this area can be compared to you running to the top of a mountain.

The next time you go wading, remember how stream flows can change from place to place. Think about where the fast and slow water areas are found. Stream flow is important to remember because it can mean the difference between a fun wade and getting washed downstream.

Volunteer's name, go ahead and put more drops in the water so we can watch stream flow again.

Moving to Stations

You should be divided into groups 1, 2, and 3. Separate into your groups now, and we'll move to the stations in about *time* minutes. Group 1 starts at Nature's Restaurant, Group 2 at Comforts of Home, and Group 3 at Incredible Journey. When you hear this sound *(Sound the duck call.)* the stations will begin. The next time you hear the *(Sound the duck call.)*, it will be time to rotate to the next station. The volunteers will point you to the next station.

Streamside Experience
Nature's Restaurant

Allow about 15 minutes to present the following information and 5 minutes for students to view fish and insects in the stream with aqua viewers. If kokanee salmon are not in your area, alter the presentation for the fish species students would most likely encounter.

Introduction

Welcome to Nature's Restaurant! My name is *volunteer's name* and my partner's name is *volunteer's name.* We're going to be your servers today. We'll start by showing you the menu for Nature's Restaurant. *Use the flip-chart illustration showing the menus for kokanee salmon and other species of trout.*

At this station you're going to learn about the different kinds of food that fish eat. You'll also learn about birds and animals that eat fish, and we'll talk about Nature's food chains and food webs.

Go to the Cool Beginnings flip chart. The kokanee salmon that you see in the stream today swam here from Wickiup Reservoir (lake) to lay their eggs in the gravel on the bottom of the creek. The tiny fish that hatches from the egg is called an **alevin**. Alevins get their first food from a yolk sac that developed in the egg. This is what the alevin looks like. *Pass around specimens in vials.* The small yolk sac that you see provides the newly hatched alevin with a "sack" lunch. The alevin hide in the gravel on the stream bottom and grow larger as they use the food in the yolk sac. Many alevin get trapped in the mud between the sand and gravel spaces at the bottom of the stream and then die. Only about 10 or 20 out of a hundred will live to grow to the fry stage. *If you are short on time, delete the last two sentences.*

Kokanee Food Sources

As it uses the food in the yolk sac, the alevin grows larger. Once the food in the yolk sac is gone, the alevin must get its food from the water. When the alevin emerges from the gravel, it is called a **FRY**.

The fry feed on tiny microscopic plants and animals that live in the water. The plants and animals are so small that we need to use a microscope to see them. *Pass around vials of preserved plankton.* In these vials, you can see the tiny size of the plants and animals that kokanee fry eat. *Have children gently shake the vials so they can see how many tiny individual plankton are in the vial. Go to the flip chart showing enlarged views of a few planktonic organisms, such as water fleas and copepods.* This is what some plankton look like when we see them under a microscope. Plant-like plankton are called **phytoplankton** and animal-like plankton are called **zooplankton**.

Hold up plankton net as a visual aid. Scientists (biologists) pull nets like these through the water to learn what type of microscopic plants and animals are in the water. The water in streams and lakes has millions and millions of these microscopic organisms swimming and floating in it.

To learn what types of microscopic plants and animals kokanee salmon eat, biologists examine the stomachs of dead fish.

Kokanee salmon can feed on microscopic plants and animals because they have special brush-like filters inside their mouth. They do not use teeth to catch and eat their food.

Filter Feeding

As the fry face upstream or swim in the water, they open their mouth and use their gill rakers to strain, filter, or collect microscopic plants and animals from the water. Gill rakers are bony projections that are attached to the gills. Kokanee salmon have more gill rakers than other salmon and trout, so they are very efficient plankton feeders. However, kokanee will feed on midges and other small aquatic insects too.

- *Use a brush to explain how a filter functions.*
- *Use a dead fish (collected prior to students' arrival) to show students where the long hairlike gill filaments and gill rakers are located. Allow the adventurous ones to feel the gill rakers.*

The gill rakers together form a funnel shape. After a kokanee catches plankton, the gill rakers funnel the plankton to the gut or stomach.

When the fry grow to about the size of a person's finger we call them **fingerlings**. Like the tiny fry, fingerlings and adult fish have adapted to filter (or strain) microscopic plants and animals from the water. The fully grown adults living in the lake feed primarily on plankton and tiny insects that get trapped on the filter filaments. Occasionally, the adults also feed on insects, like other salmonids. Sometimes, the adults also feed on organisms on the bottom of the lake.

During their entire lives, the kokanee salmon you see here today will have a unique diet because they feed primarily on zooplankton, even when they are adults. Adult kokanee spend most of their time feeding. The microscopic plants and animals kokanee feed on are so tiny, it takes thousands of these plants and animals to make a good meal.

Who can tell me the special name for the microscopic plants and animals that swim and float in the water? *Wait for students to answer "plankton" and "zooplankton."*

Food Sources For Fish

As you saw on the two menus, the trout living in the same streams and lakes as the kokanee salmon eat different types of food than kokanee salmon. The young rainbow trout, brook trout, bull trout, and brown trout feed on aquatic insects, scuds, and worms. As these fish grow larger, they feed on smaller fry and fingerlings. The large brown trout in lakes can catch and eat kokanee and other trout that are smaller than themselves.

Here you can see some of the types of insects that other kinds of trout eat.

- *Up to this point, keep the pans of live and dead insects covered and on the ground behind you, so they don't distract students. Uncover the pans now.*
- *While some of the students inspect the contents of the pans and ask questions, pass around vials of insects, such as caddis flies and their cases preserved in alcohol, and explain the contents of the vials.*
- *After the students have had a few minutes to view the specimens, remove the insect specimens from the table and go to the predator flip chart.*

Trout that live in streams and lakes and feed on insects and worms are called **predators**. Predators catch and feed on living animals that are usually smaller than they are. Predators rely on eating other animals for energy and growth.

Sources of Food for Insects

Biology is the study of how plants and animals live in nature. The food items that different animals eat is very important to biologists. *Use flip-chart illustration of insects on a rock.*

Collectors: Many insects that live in streams and rivers feed on the same plankton as kokanee salmon. Like the kokanee salmon, most of these insects use special filters to catch microscopic plants and animals as they float by in the water. We call these insects **collectors**. This illustration shows examples of how different kinds of insect collectors filter plankton from the water. *Point to illustration.*

At the back of the rock you can see a black fly larva extending its large mouth brushes. It uses these brushes to collect its food. When the mouth brushes are full of food particles, the larva moves the brushes to its mouth and eats everything off the brushes. This is how a black fly larva feeds. *Demonstrate by extending your arms up and backward over your shoulders and wiggle your fingers while you explain that fingers represent the mouth brushes.*

When a mouth-brush is full of plankton, the larva alternately brings down one brush to its mouth and eats everything off it, then brings down the other brush to its mouth and repeats the process. It continues to feed in this manner until it is full. *Have the students demonstrate feeding with you.*

Other insects also feed on microscopic plankton and microscopic food particles that drift downstream. These insects sit on rocks and sunken trees and make nets that look something like spider webs. Here you see a net on the rock. Here is what it looks like from another view. This is the insect that builds the net. The nets act like filters and catch microscopic particles of food. The net makers usually hide in a crack near the edge of the net. When the net has trapped food, the net maker crawls out of its hiding place and eats all the microscopic food off the net.

Sometimes when a net maker sneaks out of its hiding place to eat food off their net, a predator, such as a large insect or trout, sees it. What happens then? *Wait for students to answer that the predator will eat it.*

Shredders: Some insects that live in streams eat dead leaves, rotten wood, and pieces of bark that fall into the water. We call these insects **shredders**, because they tear apart and eat all the dead plant material. Here's a shredder feeding on a dead leaf behind the rock. *Explain that shredders' mouthparts are used to rip and tear, similar to shredding paper.*

Scrapers: Other kinds of insects feed on the microscopic plants that grow on rocks and sunken logs. These insects have special kinds of hard mouthparts and teeth that allow them to scrape their food off the rocks and logs. We call these insects **scrapers**. Scrapers feed on mosses, algae, and diatoms. Here's a mayfly scraper, and here is a caddisfly scraping off its food as it crawls on the rock.

Pyramid of Numbers and the Food Chain Concept

We're going to use a picture of a pyramid to learn about food chains and food webs. *Use flip-chart illustration of Nature's Food Pyramid.* A pyramid has a wide base at the bottom and a small peak at the top. We can think about the food chain in this stream as a pyramid comprised of plants and animals piled on top of each other. There are millions of microscopic plants and animals, including zooplankton and phytoplankton, at the bottom of the pyramid. These plants and animals at the bottom are called the **producers**, because they produce the food for the rest of the animals that live in the stream. Insects and kokanee salmon, which feed on plankton, and snails and scuds, which feed on plants, are found in the next level up from the bottom. At this level, there are many thousands of plants and animals, but in much fewer numbers than at the bottom level. At the next level up, there are fewer animals, probably only hundreds. The animals at this level include the larger fish predators that feed on insects, snails and scuds, and fish that are smaller than they are.

There are fewer animals at the highest level of a food pyramid. Animals that live higher up the pyramid are larger. For example, it takes all of the plants and animals lower down on the pyramid to support just one bear at the top of the food chain.

Review the Pyramid

When we study nature's food chains, here's what we learn:

1. Small insects, scuds, and snails eat microscopic plankton.
2. Frogs, small birds, and small fish eat the small insects, scuds, and snails.
3. Big fish, big birds and big animals, such as kingfishers, mergansers, mink, and otter, eat frogs, small birds, and small fish.
4. Even bigger birds and bigger animals, such as the bald eagle, osprey, bears and humans, eat the big fish, big birds, and big animals.

What would happen to this food pyramid if this stream became polluted or muddy, and all of the producers at the bottom of the pyramid died? Everything would be affected and some would die, because none of the inhabitants would have any food, unless they moved and found food in another place.

Before you leave Nature's Restaurant, I want to tell you about another kind of food chain found in this stream. This last food chain starts with **dead** fish. After spawning, all of the large fish you see in the stream are going to die. When they die, they will become a food source for many kinds of birds and animals that will find and feed on the dead fish. **Scavengers** are birds and animals that feed on dead fish. What kinds of birds and animals can you think of that would feed on dead fish? *Use flip chart to illustrate some scavengers that feed on dead fish.*

The dead fish become part of another food chain as they decompose. This food chain is dominated by microscopic organisms that are called **decomposers**.

In nature, there is a continuous recycling of nature's food resources from one food chain to another. Dead, decomposing fish return valuable nutrients to rivers and streams to keep the cycle going.

Before you leave Nature's Restaurant, we will use an Aqua Viewer to look under the water and observe the spawning kokanee salmon. You might also see some large insects on rocks. Let's go look in the water.

Streamside Experience
Comforts of Home

Hello. My name is *volunteer's name* and my partner's name is *volunteer's name*. At this station, we are going to talk about the five essential elements of salmonid habitat: shelter from fast currents, protection from predators, cold water and dissolved oxygen, food supply, and territory or space. Salmonid habitat is the place that trout and kokanee call home. Most of the fish are in a small percentage of the water. At this station, you will learn where to find most of the fish, which is important if you want to be a successful fisherman.

1. **Salmonid fish (salmon or trout) need shelter from fast currents.**

   - Fish can swim fast for only a few minutes at a time. *Ask students how long they can run or swim fast.*
   - Fish spend most of the time resting in a "holding station." *Ask students where the fish might be located.*
   - Holding stations are created when fast water is slowed by: boulders, logs, stumps, a rocky bottom, pockets, brush, roots, grass, aquatic plants, curves in the shoreline, ledges, and many other things.
   - Fish "hold" in pockets of slow water next to fast water.

2. **Salmonid fish need protection from predators.** *As you name each category of predator, ask students to name predators.*

   - Birds catch fish: osprey, eagles, herons, kingfishers and others.
   - Mammals catch fish: otters, mink, bears and others.
   - Larger fish eat smaller fish.
   - Fishermen would *like* to catch salmonids (and some release them to catch them again)!

   Protection from predators is provided by many sources:

   - Rocks, ledges and logs offer protection from above.
   - Brush or grass along a bank can hide a fish.
   - Aquatic plants in the stream can provide a hiding place.
   - Rough, rapid water is hard for predators to see through.
   - Shade can help the fish hide: salmonids are camouflaged.
   - Deep water in pools is good protection.

3. Salmonid fish need cold water, which carries lots of dissolved oxygen.

Ask students to guess the water temperature. Ask for a volunteer to read the water thermometer. Ask where cold water comes from.

- Salmonids can live in running water that is at least 32 degrees (F).
- The best temperature range for salmonids is 45 to 65 degrees (F).
- Generally, salmonids are harmed by or begin to die at temperatures above 70 degrees (F).
- Cold water is a very important quality of salmonid habitat!
- Water is kept cool by: shade from trees, willows, grasses, aquatic plants, depth, and flow. *Ask students how water is cooled.*
- Water is warmed by: exposure to sun, lack of shade, shallow depth, and low flow.
- We measure water temperature with a thermometer.
- The colder the water, the more oxygen it can hold. Fish need oxygen to breathe and to carry on their body processes.
- We measure oxygen dissolved (DO) in water in parts per million (ppm). The normal range for DO in a stream or lake is 0-13 ppm. At 12-13 ppm, water becomes saturated with DO. (The saturation point varies with water temperature.) Juvenile and adult salmonids are generally not affected if the DO is greater than 8 ppm. In early stages of development, fish need slightly higher concentrations of DO.
- The amount of dissolved oxygen is affected by: temperature, altitude, agitation of the water, plants growing in the water, and reduced light due to dissolved solids such as silt.

4. Salmonid fish need a good supply of food. *Tell students they will learn more about what salmonids eat at Nature's Restaurant.*

- Fish prefer an "easy meal." Fish will first feed on larger food sources and food items that require the least amount of energy.
- Faster water brings food to fish lying in their holding stations, so they spend less energy chasing it.
- The biggest fish need the largest food supplies.

5. Fish need a territory large enough to include all of the Comforts of Home. *Ask students to define "territory."*

- Larger fish will defend a good territory from smaller fish.
- What are the Five Essential elements needed for a good fish territory?

Have students play the Comforts of Home game. See the **Appendices** for a description of the game.

Streamside Experience
The Incredible Journey

As students arrive at the station, ask them to view the fish in the stream. Point out the different sizes, colorations, and positions in the stream. Also point out the dead and dying fish on the sides of the stream. When the session begins, have students sit in a semicircle, facing the stream.

Welcome and Introduction

Hello, my name is *volunteer's name*. In your science studies this year, you might discuss the salmon or trout life cycle. Let's talk about the life cycle of the kokanee salmon. What is happening in the stream? *Answer, briefly, any questions or remarks about fish spawning.*

Yes, the fish are spawning. A big part of the kokanee's life cycle is happening right in front of you. *Display and explain the Circle of Life poster.*

The salmon life cycle involves the following series of events:

- Adult female fish lay eggs that are fertilized by adult male fish.
- Eggs develop into fry.
- Fry develop into fingerlings.
- Fingerlings or juveniles develop into adults.
- Adults mature and then return to the stream where they hatched in order to spawn themselves.
- After spawning, the mature fish die, but their eggs start the cycle again!

Spawning — Let's Talk About It!

The mature female fish selects a location with good gravel and water conditions. She then rolls on her side and creates a depression in the gravel by fanning her body and tail (digging). *Display poster of female kokanee digging a redd.*

This depression is called a **redd**. That is spelled r-e-d-d, not r-e-d. Upon completing the digging, a male kokanee joins her over the redd. *Display poster of two kokanee on the redd.*

She then expels some of her eggs. As she does this, the male expels **milt,** which fertilizes the eggs. The eggs fall to the bottom of the depression because they are heavier than water. The eggs have a sticky covering so they stick to the gravel in the redd. After she has expelled all the eggs, and they have been fertilized, the female moves to the forward part of the redd and begins to fan gravel with her tail to bury the eggs. The female buries the eggs to protect them from predators such as other fish, birds, and crayfish. The eggs also need protection from the ultraviolet (UV) radiation in sunlight. UV radiation can kill the eggs.

The female kokanee produces about 500-1000 eggs, makes several redds, and often spawns with more than one male. After she is done spawning, she and the male will die within a few days. However, life is starting over again in the eggs she has laid.

Life Stages

In your classroom, there is an egg display similar to this one. *Show egg display. Briefly explain the stages from egg to alevin to fry. Include the approximate time period it takes to reach each stage.*

- The eggs hatch in approximately 6 weeks, depending on the water temperature.
- The alevin stage lasts 2 to 3 weeks or more.
- The change from alevin to fry occurs as the nutrition in the yolk sac is absorbed. (The alevin is called a fry when it emerges from the gravel.)

The rate of growth and development depends on water temperature. The colder the water, the slower the rate of development. *Explain to students how the fry move to Wickiup Reservoir and grow into adults, returning in about 3 years. Kokanee salmon in the Metolius River and Lake Billy Chinook have the same life cycle.*

Hazards in the Life Cycle

Briefly review the life stages of the kokanee, place the appropriate kokanee life stage piece (1,000 eggs, 800 fry, 500 fingerlings, 50 adults, 2 spawning adults) onto the velcro as you describe each life stage and hazard, and complete the circle.

Natural Survival Game

This game provides an opportunity to learn about the kokanee's odds of surviving from a freshly laid egg in the gravel to maturity. The game consists of fate cards that determine if a kokanee moves on to the next stage or perishes. At the end of the game, only one card remains, representing 2 spawning kokanee.

How to Play the Game

Divide students into equal groups. (Ideally, there should be at least 10 players. If ten students are not present, ask parent chaperones to participate.) Explain that each student represents an egg cluster of 100 eggs on the bottom row of the natural survival pyramid. Give each student an egg cluster fate card. Eight of the ten cards allow students to survive to the fry stage, while two fate cards cause the egg cluster to perish. Therefore, two of the students are out of the game. Exchange the surviving egg cluster fate cards for fry cluster illustrations, and have students place the fry cluster illustrations on the row above the egg sacs on the natural survival pyramid. Survivors then draw a fry fate card. Five of the eight will survive to the fingerling stage, and three will perish. The five survivors will then replace their fry cluster illustration with a fingerling cluster illustration on the natural survival pyramid, and draw a fingerling fate card. Only two students will survive to the lake adult stage, replacing their fingerling cluster illustration with a lake adult cluster illustration. These two will draw a lake adult fate card. One will perish and the other will survive. The "winning" card will represent two spawning adults that are at the top of the survival pyramid.

The game illustrates that many eggs are laid, but only a small percentage of the eggs survive to become spawning adults. In nature, the survival rate for each life stage is even lower, especially for the egg to fry stage.

Sockeye Compared to Kokanee

Kokanee are landlocked sockeye salmon. Salmon are **anadromous**, meaning the fish lay eggs in freshwater, but spend much of their life in the ocean. The adults then return to freshwater to spawn. That is what we call the Incredible Journey.

The kokanee salmon in Wickiup Reservoir and Brown's Creek were introduced several decades ago; they are not native fish. If these kokanee had access to the ocean, which is blocked by dams such as Wickiup Dam and Round Butte Dam, they would range far and wide in the ocean, traveling as far north as Alaska, and put on a lot of weight while feeding constantly. This is what sockeye salmon do. While the kokanee were young fish in Brown's Creek, they **imprinted** to the stream, probably by smell, which means they can identify the uniqueness of this stream. After three years of swimming in Wickiup Reservoir, they have the urge at this time of year (autumn) to return to the stream in which they were born and to spawn. Sockeye salmon face many perils from predators (birds, bears, and seals), sport and commercial fishermen, waterfalls, and dams as they travel downstream as young fish and as they migrate upstream as adults.

Both kokanee and sockeye are unique salmon because they are **filter feeders**, which you will learn about at Nature's Restaurant. What do filter feeders feed on? *Plankton.* Feeding on plankton separates them from other types of salmon and enables them to survive in many of the local lakes and reservoirs.

Changes in the Body

Show models of kokanee salmon. Throughout most of their lives, kokanee are very bright, shiny, silvery fish. This coloration gives them camouflage from predators. But as the fish mature and prepare for spawning, their bodies undergo some very noticeable changes. The bright shiny color disappears, replaced by a crimson or reddish body with a green head. The male develops a pronounced hook jaw and the teeth enlarge. Some of the fish become very dark, especially as they complete spawning and are near death. *Have the children compare the two models.*

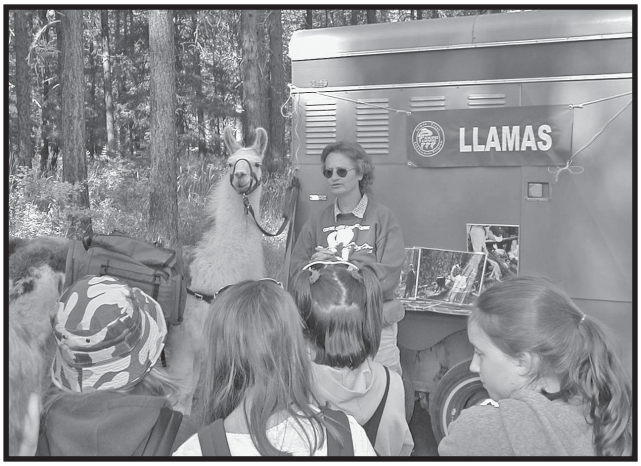
Conclusion

We talked about the Incredible Journey and the life cycle of salmon.

- What is the depression called where the female lays her eggs? *redd*
- What do kokanee primarily eat? *plankton*
- What are the stages in the life cycle of the kokanee salmon? *egg, alevin, fry, fingerling, adult*
  Oceangoing sockeye salmon undergo one additional stage – the smolt stage. The smolt stage occurs as the salmon travels downstream. Its body becomes shiny and undergoes changes so the fish can tolerate salt water.

Scripts – Hatchery Experience

This section contains the following scripts for the Hatchery Experience:



Hatchery Experience
Welcome

Before students begin the hatchery tour, remind them about safety. A hatchery is different from a school playground. Walkways at a hatchery can be very slippery, and there are potential hazards everywhere because of moving equipment.

Students are guests at the hatchery, and they must observe hatchery rules, such as no running, staying together in the group, and paying close attention to the speaker. Remind students about their behavior as needed during the hatchery tour.

Welcome to the *name of hatchery*. *Introduce all presenters, members of Sunriver Anglers, and hatchery staff. (Everyone should wear a name badge.)* Today, we will talk about Oregon's hatcheries and their role in the management of fish populations.

Why do we have hatcheries?

- Produce fish
- Catch and *eat* the hatchery fish
- Save our fish *How?*
- Catch and *release* the *wild* fish

Do we have many native fish?

- Yes, but many native fish species are in trouble.

Why?

- Pollution
- Disease
- Destroyed habitat
- Low stream flow (dams, irrigation)
- Competition with non-native fish

How many *native* fish survive to be "teenagers" (8" long)?

- 5% — that is 1 out of 20!

How many *hatchery* fish survive to be "teenagers" (8" long)?

- 90% — that is 9 out of 10 (or 18 out of 20)!
- Compare a human being born in the wild to one born in a hospital.

How many hatcheries do we have in Oregon?

- 34

Are hatcheries important? *Yes!* Hatcheries stock hatchery fish in our lakes and streams, so we have lots of fish to catch and eat, which helps our native fish species by taking the pressure off them. Have any of you caught a hatchery fish? *Allow students to answer.*

How do you identify hatchery fish?

- Clipped fins
- Tags
- Radio transmitter

Once again, are hatcheries important?

Introduce speaker for "Broodstock" station.

Hatchery Experience
Broodstock

Hello. My name is *volunteer's name*. Today, we will talk about how we get fish eggs for the hatchery.

Where do we get the eggs for the hatchery?

- Mature fish in our lakes and streams
  Special programs, like the cranebow program, use naturally adapted adult fish as broodstock to keep the best survival characteristics in the population.

How do we capture the fish?

- Fish traps

We have several types of fish traps. *Show traps, which are supplied by the hatchery.*

- Aluminum screen traps — portable, easy to assemble — for rivers
- Rack and pipe traps — big, heavy — pipes fit river contour
- Trap nets — floats like a big curtain — on lakes — minimal labor
- Seine nets — a person at each end — labor intensive
- Gill nets — fish try to swim through small mesh, gills catch in the mesh

How do we get the equipment to remote lakes and streams?

- Trucks, snowmobiles — once upon a time . . . men on snowshoes!

Now that we have captured some fish to spawn, what happens next?

- Get the eggs for the hatchery!

Hatchery Experience
Eggs and Milt Spawning

Hello. My name is *volunteer's name*, and I'm going to talk about the fish spawning process at the hatchery.

We have to capture the fish before they are ready to spawn and put them in live pens until they are "ripe."

Let's take a look at a spawning trout — boy or girl (buck or hen).

- *Wear gloves to hold fish.*
- *Hatchery personnel hands specimen to presenter.*
- *Describe the characteristics of mature males and females.*
- *Provide a simple explanation/demonstration of the matrix spawning method, which increases genetic diversity.*

  NOTE: The matrix spawning method is based on a mathematical model and is designed to increase genetic diversity. This method provides the most spawning combinations within a given group of male and female fish. It also ensures that the eggs become fertilized in the spawning process even if there are non-fertile fish in the group.
- *Let the students touch the fish.* **Keep the fish out of water no longer than 2 minutes maximum.** *Repeat process with fish of opposite sex.*

Now we will simulate spawning a male and female. We'll use artificial eggs for the eggs, and cream for the milt as an example of the process that occurs here at the hatchery later in the year.

- *Put eggs in pan.* — We get about 2000-5000 eggs per female.
- *Add milt (cream). Pour from container other than cream carton.*— ODFW takes samples to labs for analysis of disease organisms.
- *Stir.* — Fertilization is immediate.

Let students stir the eggs and cream.

The following factors are important to the success of the spawning process at the hatchery:

- Using well documented, time-tested methods
- Handling the fish properly
- Maintaining a high fertility level – mature egg and sperm development
- Employing experienced technicians and volunteers
- Preventing direct sunlight from coming in contact with the eggs

Now we have to get the eggs to the hatchery. Let's walk to the hatch house.

Hatchery Experience
Incubation — Hatch House

Hello. My name is *volunteer's name*. At this station, we're going to talk about incubation.

Why do we call this the "hatch house?"

How do we get the eggs here?
- Milk cans, pickups, snowmobiles
- Sometimes by plane or train
- In the old days — sleds and snowshoes

Describe the incubation trough.

Fresh water from the river continually runs to provide what?
- Oxygen in the water (dissolved oxygen).

What do we need to be successful in the hatch house?
- Good quality water
- Cold and clean
- Disease free
- Protection from predators

Explain how the eggs develop. Show display. (Students may have seen the display in their classroom prior to coming.)

There are thousands of eggs in each basket.

After the alevins absorb their yolk sac and are swimming, they go to a large tank where we start feeding them. Let's look over here.

After the fry grow about 4 times larger, hatchery personnel move the fry to the outdoor ponds.

They live in the outdoor ponds until they grow to adults.

Does anyone have a question?

Now, let's walk to the food store.

Hatchery Experience
Feed Room

Hello. My name is *volunteer's name*. I'm going to tell you about how we feed fish at the hatchery. First, we'll talk about what hatchery fish eat. *Examples of different sized fish food pellets for different sized fish are supplied by the hatchery. Use food pellets as a prop.*

Provide a quick review of the old feed room and freezer. Discuss grinding meat meal. Show 50 pound bag of food.

What do the feed pellets contain? *Show the contents on the feed sack label. Discuss the purpose of the important ingredients.*

- Protein — a balanced fish diet
- Vitamins

We control growth by controlling the amount of food per day. Why? *Discuss the concept of balancing the size of the feed pellets with the size of the fish and the type of fish.*

We let fish grow to the right size before we release them.

Next, we will walk to the rearing ponds. **Listen carefully!**

- Emphasize safety: Walk cautiously, only in designated areas!
- The walkway grating is very sharp, and we do not want you to fall and injure yourself.

If you are careful, we can feed the fish.

Each chaperone can come forward and get fish food for their group.

Have fun, and be careful!

Hatchery Experience
Rearing Ponds and Liberation

Hello. My name is ***volunteer's name***. At this station, I'm going to talk to you about fish rearing and distribution. First we're going to talk about rearing the fish.

Fish grow at different rates, like people. We separate the fish into ponds, according to their size.

Then, the food is controlled to keep them trim.

They are fed daily, by hand or automatic feeders until they grow to about 8 inches in length. *Discuss and view automated feeders in operation.*

They stay in the ponds for 1 to 1½ years.

Now let's talk about how we distribute and transport fish.

What is distribution?
- Delivering fish to lakes and streams in Central Oregon

First, we have to catch the fish before we can transport and distribute them. *Show nets and pumps and describe how they are used.*

How do we transport the fish?
- Tanker trucks, which are also called "liberation" trucks (haul 5, 8-inch fish for each gallon of water = 5,000 fish maximum, per 1,000 gallons of water)
- Horses
- Back packs
- Llamas
- Helicopter

What does the truck need to keep the fish healthy? *Hatchery usually makes truck available for student viewing.*
- Oxygen and refrigeration

Now, lets go to the Liberation (fish stocking) station.

Hatchery Experience
Stocking Methods

Hello. My name is *volunteer's nam*e. I'm going to talk to you about fish stocking methods.

People who work at a hatchery use the terms "liberation" and "stocking." When we liberate fish, we release them so they can grow larger, or so they can migrate to the ocean, just like salmon. In most places where we stock fish, we expect them to be caught by fishermen.

Let's talk about how we stock lakes and ponds.

Air stocking by helicopter

- We use the "space shuttle" every other year to stock the high lakes.
- It hangs on a cable below a helicopter and has 30 compartments to hold water and 1,000 fish.
- The pilot hovers 200 feet over the lake and the biologist pushes a button for a fish "belly flop."

How big are the fish in the shuttle?

- 8 inches? — *NO!*
- 1 ½ inches! In one year, these fish should grow to 8 inches, which is the legal length to catch.

Back Packs

We use the back packs with buckets full of what?

- Fish, water, ice cubes

We allow one-hour maximum hike time. Why?

- Ice melts, oxygen depletes, and fish die!

Let students try on back packs.

Are there other ways to stock?

- Horses
- Llamas

Let's go see the Llamas!

Llamas are shy, so we have to **walk slowly and quietly.**

Have students follow the leader to the llama area.

Introduce the llama presenter.

Hatchery Experience
Llamas

A volunteer with experience in fish stocking with llamas is essential to managing this station with his or her own llamas.

Set up the station in advance (trailer, llamas, packs, photos, and other appropriate gear and props). When students arrive, let them know where to stand for the talk. It is helpful to set up a visual barrier. Students should be able to see you and your llama easily. However, students must remain back a short distance so the llama remains comfortable.

Begin your talk with a few questions. Allow several students to respond.

- How large do you think the fish are that we stock?
- How much weight do you think a llama can carry?

Ask any other appropriate questions to draw students' attention.

Talk about the ease with which llamas walk on a trail. Explain that llamas have a pad on the bottom of their feet, so they cause little or no damage to the trail. The hike is easy on the fish, because the llamas provide a smooth ride.

Explain that when fish are fingerling size, they are packed in water and ice in plastic bags. *Hold up your fingers to demonstrate fingerling size.* The plastic bags are secured with zip ties. *Have a plastic bag and zip ties available to demonstrate for students.*

While talking, place the plastic bag into the square bucket that is already in the llama's pannier, and place the pannier on the packsaddle. *If you already have the other pannier on the llama, you will demonstrate on only one side.*

Explain that lakes stocked by llamas are an easy hike for a family and a short distance for the fish, about 1-3 miles each way. Upon arriving at the lake, the bags of fish are removed and placed into the lake without opening them. This process allows the water temperature of the bag to reach the water temperature of the lake. Then, the fish are slowly released from the bag. The survival rate for fish stocked by llamas is 90 -100%. The average survival rate is around 99% for this stocking method. This survival rate is much higher than dropping fish into the lake from a helicopter.

Talk about your personal experience and excitement stocking fish with llamas. Tell students how many times you have stocked lakes and how many llamas you have used for stocking.

Ask the students if they have any questions. Tell students the llama's names. Ask students to form a line and allow them to pet the llamas "from the front" of the llama around its shoulder and neck area. Emphasize the importance of not walking behind a large animal and not surprising it.

If you have two or more sessions in one day, give your llamas a break. Take them for a walk and give them water and a little feed. Remember to clean up after your llama. The llamas seem to really enjoy this event.

Hatchery Experience
Salmon People

Native Americans describe how and why salmon are important to their culture. They often show examples or products and other items related to salmon. A script is unavailable because the presentation varies, depending on the presenter. Each presenter usually speaks about their personal experiences. Encourage presenters to bring examples of their cultural tools and products to show students.

Scripts – Angling Clinic Experience

This section contains the following scripts for the Angling Clinic Experience:

Angling Clinic Experience
Welcome

Students arrive about 9:00 AM. By 9:30, everyone should be assembled outdoors to play Hooks and Ladders.

- Introduce yourself.
- Name and describe Kokanee Karnival's five producing partners: The Central Oregon Flyfishers, Sunriver Anglers, Central Oregon Llama Association, Oregon Department of Fish and Wildlife Salmon-Trout Enhancement Program, and Deschutes National Forest.
- Show the "Thank You Spawnsors" display. Explain that sponsors have donated money so Kokanee Karnival can occur.
- Point out locations of the restrooms and drinking fountain.
- Emphasize that everyone must **Walk**; there will be **No Running**. (This rule is especially important if the ground is wet and slippery.)
- Explain the schedule for the day: play Hooks and Ladders, rotate to the four stations (with short breaks between rotations), eat lunch, and fish in the afternoon.
- Explain that you must be under 17 years old to fish at Shevlin pond. Students may catch and release as many fish as they like. Or they may keep up to the 2-fish limit. Once they catch and keep 2 fish, they must stop fishing for the day. If students want to tie flies, they must do so before 1:30.
- Sound the duck call once, which means pay attention for an announcement.
- Sound the duck call twice, which means it's time to begin or end an activity.
- Ask everyone to meet outdoors near the area outlined by ribbons to play Hooks and Ladders. For a description of Hooks and Ladders, see the **Appendices**.

Angling Clinic Experience
Fish Biology: Care of the Catch

This station emphasizes fish anatomy and relies on a stuffed cloth fish as a visual aid. Fisheries biologists from the ODFW and DNF may bring additional visual aids, including posters and mounted fish, and then present additional information.

Hello. My name is *volunteer's name*. We are going to talk about caring for fish, whether you catch and release them or catch and keep them.

Catch and Release (external organs)

What is the first thing you notice about a fish when you touch it? *It's slimy*! Do you know why?

- Slime protects the fish from bacteria and other microscopic organisms that live in the water.
- Slime helps the fish get away from some predators.
- Slime reduces friction so the fish can swim through the water easily and slide over objects in the water.

Always wet your hands before touching the fish.

How is a fish's skin different from ours? *They have scales.*

- Most fish have scales for protection and to streamline their body for movement in the water.
- As the fish grows larger, so do the scales. You can determine the age of a fish by the growth rings on the scales.
- If the scales are damaged and the outer protective slime layer is removed, bacteria can infect and kill the fish.

Let's look at a fish's eyes. How are a fish's eyes different from ours?

- The eyes operate independently. (A fish can look up with one eye and look down with the other eye at the same time.)
- Fish have a wide range of vision and can see all the way around them, which helps them see food and predators.

How many eyelids does a trout have? *Zero.*

What do our eyelids do for us? *They help keep our eyes wet and protect them from dust, dirt, and other objects.* What happens if you touch a fish's eyes? *You may remove some of the slime, which could lead to a bacterial infection.*

Notice that a trout is dark colored on the back and light colored on the belly.

- The dark colored back camouflages the fish so predators hunting from above, such as the eagle and osprey, cannot see the fish easily.
- The light colored belly camouflages the fish so predators from below, like bigger fish, cannot see the fish against the lighter surface.

Do fish have nostrils? *Yes*

Do fish breathe through their nostrils? *No. Fish use their nostrils only for smell.*

How sensitive is a fish's sense of smell? *Extremely sensitive. Scientists believe that salmon use their sense of smell to find their way to their spawning grounds. Salmon and trout are able to detect the odor of predators (human, bear, otter, and sea lion).*

What happens if oil spills into the water? *Among other things, the oil blocks the fish's sense of smell.*

How do fish breathe? *Show gill cover and plates.*

- Oxygen is exchanged in the tiny blood vessels making up the gill filaments.

What happens if you touch the gills? *Touching gills can cause physical harm to the gills, or it could cause bacteria to be transferred from our hands.*

If you take a fish out of water, it will suffocate — just like you can drown in the water. Why? *Gills are 2 cells thick; they collapse out of the water, and the fish can't absorb oxygen. Fish can absorb oxygen from water only, not air.*

What are the names of the fins and what do they do?

- Pectoral fins - These fins are like arms. Remember, you use pectoral muscles when you pick up things. *Imitate lifting.* Pectoral fins help fish steer and maintain position (tread water).
- Pelvic fins - These fins are like your legs. Remember, you use pelvic muscles when you "prance." *Demonstrate a few high steps.* Pelvic fins also help the fish steer and change direction.
- Anal fin - Named "anal fin" because it is by the anal vent.
- Dorsal fin - The dorsal fin helps balance the fish; it helps provide power and speed.
- Caudal fin - The caudal or tail fin propels the fish through the water and acts like a rudder. A fish could swim with just this fin, but the fish would look like a snake, and it would have no control over direction.
- Adipose fin - Adipose means fatty tissue in medical terms, but it's an important fin for us to know about. *Discuss regulations and fines, catch and keep fin-clipped fish, etc.*

What's this line down the side of the fish called, and what does it do? *Lateral line*

- The lateral line is a series of small holes with sensitive nerve endings. These nerve endings allow the fish to "feel" or sense when a predator approaches.

Handling Fish for Catch and Release

1. Use barbless hooks; they are easier to remove.
2. Before you touch the fish, wet your hands so you don't damage the slime.
3. Hold the fish by its back, and don't squeeze hard. *Discuss swim bladder later.*
4. Turn the fish upside down, and keep it in the water when removing the hook. When the fish is upside down, it is disoriented, and it may quit squirming and trying to escape. Turn the fish back over as soon as you can.

5. Use a catch and release net to avoid damaging the scales.

6. If the hook is way down the fish's throat, and the fish is not bleeding excessively, cut the line. The hook will fall out in a few days. *Most hooks fall out in three to five days.*

Catch and Keep (internal organs)

What is the first thing you should do if you catch a fish, and you decide to keep it?

- Hit it over the head so it doesn't suffer.
- Clean it immediately and put it in ice. *In a minute, we'll see why this is the correct thing to do.*

Using the fabric model fish, cut open the fish:

1. Start at the anal vent, but don't cut too deep. *Demonstrate, using fingers to mimic scissors motion.*
2. Cut to almost the "v" right between the gills.
3. Using your thumb, run up the cut line and make sure you have cut deep enough. Open the fish and see what's inside.

What is the first thing you notice inside the fish?

- Two white sacs contain sperm in a male. Two purple sacs contain eggs in a female. *Trout survival rate: 2-3 reach adulthood from 2,500-3,000 eggs*

What is this organ that looks like a bunch of worms?

- Stomach area
- Pyloric Caeca (Pie-lorick See-caw) The pyloric caeca secret acids and enzymes that digest food.

What is the small purple organ? *Spleen*

- Recycles old blood cells
- Produces new blood cells
- Emergency blood supply when injured

What is the large purple organ? *Liver*

- Filters the blood
- Helps make food usable by the body

What is the small diamond-shaped organ between the gills? *Heart*

- 2 chambers *Your heart has four chambers.*
- located between the gills *Ours is between the lungs, which is more efficient.*

After you remove all these organs, you will see a small shiny sac. What is it? *Swim bladder*

- Trout have a swim bladder. Bottom fish don't have one.
- The fish can inflate or deflate the swim bladder, depending on the level at which it chooses to swim or feed. This is called neutral buoyancy.
- If you want to catch and release the fish, do not squeeze the fish's belly. Squeezing can rupture the swim bladder, and the fish will not be able to stay upright in the water.

The last thing you notice inside the fish is a dark red line along the backbone. Any idea what it might be? *Kidney*

- Humans have two kidneys, but fish have only one.
- Kidneys produce white blood cells to fight infections.
- Kidneys filter toxins out of the blood.
- Kidneys break down old blood cells.

Now that I have cleaned the fish while I'm out fishing, what do I do with all of this stuff? *Hold up the various parts.*

- Just throw it in the brush up the bank? *NO.* It can be deadly to some animals, like the dog you take for a walk. If a dog isn't immune to certain organisms found in salmon and steelhead blood, it can kill the dog.
- Throw it in the water? *NO.* Oregon fishing regulations state that you cannot clean fish in the water because it might spread diseases.
- Wrap the remains in newspaper, place them into a plastic bag, and put the bag into a trash can with a tight-fitting lid that animals cannot remove. *Yes*

Closing

Leave about 5 minutes for questions and answers. If students have no questions, here is a "pop quiz" to see if they paid attention:

1. What is the dark red line on the inside along the backbone?
   a. spleen
   b. blood reserve
   c. kidney *correct answer*

2. Why does a dying trout go belly up?
   a. Most of the meat is on top of the fish.
   b. Predators and scavengers can see them better and eat them.
   c. Their swim bladder is below the center of gravity and the air in it turns them over. *correct answer*
   d. They can take in more oxygen if they are on their backs.

3. How many chambers does a trout heart have?
   a. 1
   b. 2 *correct answer*
   c. 3
   d. 4

4. How many eyelids do trout have?
   a. 2
   b. 0 *correct answer*
   c. 1
   d. depends on the age of the fish

5. What do biologists use the fish scales for?
   a. DNA testing
   b. determining sex
   c. determining age (Fish don't carry ID cards.) *correct answer*
   d. all of the above

6. How often do fish grow more scales as they get older?
   a. once a week
   b. every day
   c. Never, the scales just grow larger. *correct answer*
   d. once a month

Angling Clinic Experience
Casting and Water Safety

Volunteers should wear different styles of life jackets.

Hello. My name is *volunteer's name*, and these are my volunteer assistants. *Introduce volunteers.* Today, you can practice your casting technique. *Using a closed face spinning reel and rod, casually cast while talking.* I'm sure some of you already know how to cast, and you might be able to help your classmates this afternoon. Before we talk about how to cast, we need to talk about water safety. This discussion is important because someday you might remember something from this talk that could save your life or someone else's.

Hypothermia

It's easy to survive in a tropical, warm ocean for one day. When the temperature of water is 45-50 degrees, like the water we have here, you have only a couple of minutes to do something so you can survive.

- **Hypothermia** is a big word that has to do with rapid body heat loss when your body is cold.
- Hypothermia can cause **shock**, which can lead to death.
- If you or someone else has hypothermia, you need an external heat source (shower, warm place, someone else) to warm your body.

Let's see what happens if you place just one hand in the water for only one minute or less! *Fill bucket with water from sink area. Water temperature is usually in the mid 40-degree range. Ask students to place one hand in the bucket and keep hand in the bucket for one minute.*

While students have hands in buckets, talk about other related topics. Remind students to walk, not run around lakes, streams, or boat docks. After one minute, have all students remove hands from buckets and dry hands on towels. Talk about how cold their hands were after one minute and relate discussion to hypothermia. If their hand felt cold and stiff after just one minute, what would happen if their entire body was submerged in cold water? To conserve or save body heat in cold water, use small leg and arm movements. Clothing helps conserve body heat.

Rescuing Yourself

Self-rescue is knowing how to save yourself. Always wear a life jacket when on a boat or near dangerous water. It's the smart thing to do, and it's the law.

Always keep your life jacket snug, know if you can get back into the boat (or get back on if it is upside down), or if you will have to swim to shore. Be aware if others close to you would hear your call for help. If so, call and stay with the boat. What could you do to alert someone else if they can't hear you calling? *Blow whistle loudly.*

If you fall into a fast moving stream, put your feet downstream, and keep your nose and toes up. Your shoes will hit the rocks, not your head. Move your arms so you go toward shore. If you see a strong branch, use it to help get ashore. Do not get swept under bushy branches of a partially submerged tree.

- Always think about how you could rescue yourself (self rescue) if you had to.
- What could you do if you were alone with no one available to help you?
- What could you do if the person with you cannot help you?

Rescuing Someone Else

- To help rescue someone else, use a rope, stick, or some other device to reach out to them.
- Do not get into the water.
- Without a rope or stick, you will get too close, and the person in the water might grab you and pull you under too.

Reach - Throw - Row - Go

- **Reach** with an oar
- **Throw** a boat cushion or rope
- **Row** the boat to the person
- **Go** for help

Life Jackets

Let's talk about life jackets. We already know that minutes count when in cold water. Within 10 minutes, you might not be able to think clearly or grab a rope or stick.

Show a seat cushion. A seat cushion is not a legal personal flotation device. It gets lost as you fall in the water, and it will not keep you afloat if you are injured or unconscious.

Show a life jacket. A life jacket is required for ages 12 and under.

- Wear it snugly. It cannot help you if it is under the seat of the boat.
- Some types of life jackets inflate automatically as soon as they hit the water.
- Other types may be inflated or filled. Some types are filled by blowing in a fill tube. Others are filled by pulling a rope that activates a carbon dioxide cartridge.

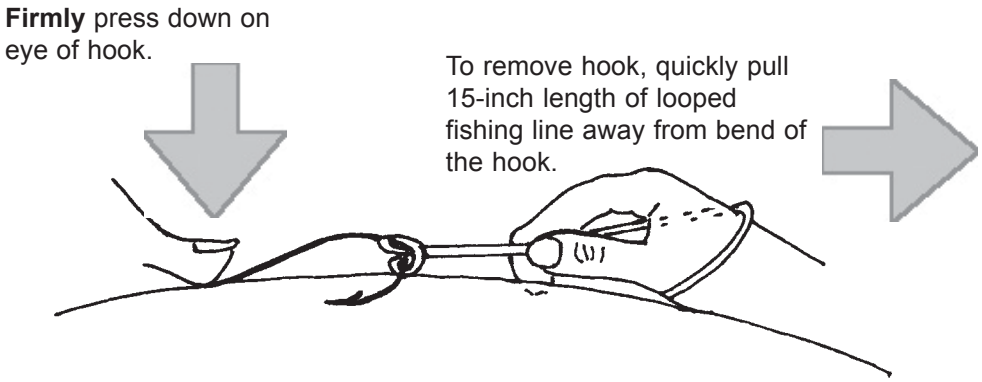
Being Outdoors

What are other things to think about if you are going to be comfortable and safe when you are outdoors?

- Dress for the weather. Wear layers of clothing. Bring extra clothing in case you get wet and cold.
- Eat regular meals and drink plenty of water that you bring with you or sterilize. Beware of Giardia in lake and stream water.
- Stay found. *Don't get lost.*

De-Barbing Hooks

Ask a student volunteer to come forward. Discuss the advantages of barbless hooks — easier to hook and release a fish, yourself, clothing, or anything else you snag with the hook. Place a 15-inch length of looped fishing line (If fishing line is unavailable, use a shoelace.) around your wrist and form a loop between your thumb and forefinger. Pretend to demonstrate how to easily remove the debarbed hook from the student volunteer's hand. As you prepare to plant the hook in the student volunteer's hand, remove an orange from your back pocket. Place the orange in the student volunteer's hand and plant the hook into the orange. Place the loop of the fishing line in the bend of the hook. **Firmly** press the eye of the hook downward and remove the hook by pulling the looped fishing line backward with your wrist.



Casting

Using closed face spinning reels and rods, have students fish for plastic "lawn bass." Place an eraser or small plastic bass on end of line as a hook.

How would you throw a ball or a stick? Overhead casting is almost the same. You speed up, then stop in the direction you want to cast. Casting overhead is more accurate than other casting methods, and it is a safer method to use with a group of students. Remember to keep the reel on top, then release your thumb — as you would let go of a ball. When you cast, speed up, stop, and raise your thumb in the direction you want to cast. Always keep the following things in mind when you cast:

- Keep rod tips up — beware of danger to your eyes and other peoples's eyes. If you have glasses or sunglasses, wear them to protect your eyes.
- Look behind you **before every** cast.

Remind students not to leave rods and reels on the ground; the next group of students needs to use them.

Angling Clinic Experience Knots

If necessary, the presenter should see, in advance, one of the many excellent books available on knot tying.

Hello. My name is *volunteer's name*, and these are my volunteer assistants. *Introduce volunteers.*

Give each student two pieces of rope, about 15 inches in length. Today, you will learn to tie three knots: Improved Clinch Knot, Surgeon's End Loop, and Surgeon's Knot.

Why should we learn to tie knots? *Allow students to answer (tie lures, tie together two lines, tie your dog to a tree, etc.)*

Explain how to use each knot.

- Improved Clinch Knot – To tie fly to tippet.
- Surgeon's End Loop – To create a loop in leader or line so you can attach a bait hook easily, or so you can attach a leader and fly line.
- Surgeon's Knot – To tie together leader and line or leader and tippet.

Demonstrate each knot while students watch. Then tie each knot slowly while students follow along with their pieces of rope. Repeat until students can tie knots with some proficiency.

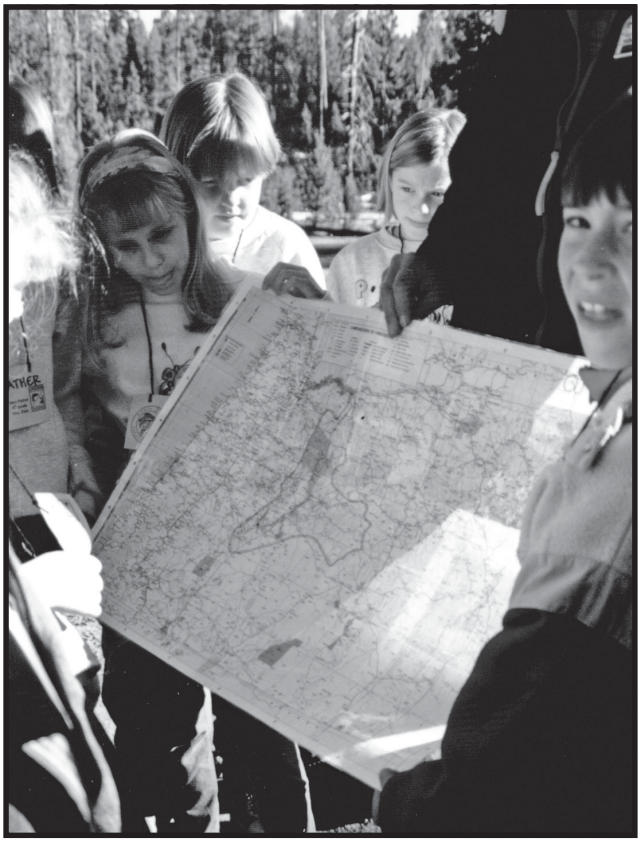
Angling Clinic Experience
Fishing Tackle and Methods

Volunteers should wear fishing vest or pack and other gear. Use the following questions as a guide. Vary the questions and the presentation depending on the type of gear available, the knowledge and experience of the students, and other factors.

- Hello. My name is *volunteer's name*, and these are my volunteer assistants. *Introduce volunteers.*
- What are the four types of rods and reels? *(spinning, spincasting, baitcasting, and fly-fishing)*
- What do we call fishing line? *(monofilament - for all spinning rods, braided, fly line, etc.)*
- What does 40-pound test mean? *(the line can hold a 40-pound fish before it will break)*
- What fish species can reach 100 pounds? *(sturgeon, halibut) Show sturgeon hook and lead weight.*
- Talk about fly-fishing rods and reels. Explain how they differ from spinning rods and reels. *(weight and stiffness in the line, not the rod)*
- Have students look at lures *(jigs, plugs, flies, spoons, spinners, and soft plastics). Point out parts of lures. Show which float, sink, and remain stationary.*
- Show various types of bait and explain how to use each type. *(live worms, powerbait, plastic worms)*

Scripts – Angler Education

This section contains the following scripts for Angler Education:



Angler Education
Introduction to Angler Education

The certified volunteer Angler Education Instructor may use this sample script during the first Angler Education session. During the first session, the volunteer provides each student with a copy of *Responsible Angling: The Oregon Angler Education Manual,* a current copy of the *Oregon Sport Fishing Regulations*, and the Oregon Sport Fishing Regulations Worksheet. The volunteer explains what students must do before the second Angler Education session. *Allow about 15 minutes for this portion of Angler Education.*

Welcome to the Angler Education portion of Kokanee Karnival! My name is *volunteer's name*.

I am a volunteer certified Master Angler Instructor for the Oregon Department of Fish and Wildlife's Angler Education program. In a few weeks, a fish crew will visit your classroom and discuss the following fishing topics:

- Angling Regulations
- Knot tying
- Ethics/Dilemmas
- Safety

Before the fish crew visits, you will receive a copy of *Responsible Angling: The Oregon Angler Education Manual,* a current copy of the *Oregon Sport Fishing Regulations*, and the Oregon Sport Fishing Regulations Worksheet. You will learn about the following topics:

- Getting Ready to Go Fishing
- Fishing Fun-Fish Identification
- Understanding Fish and Where They Live
- Fish and People
- Giving Something Back to Fish

Here are a few things you need to do:

1. Write your name on the outside cover of the manual and the regulations.
2. Inside the front cover of the manual is a registration form. Fill out this form now.
3. Read the manual and use your copy of the *Oregon Sport Fishing Regulations* to complete the worksheet **before** the fish crew visits.

Use a pencil. Then you can easily correct any mistakes.

Take your time, study hard, and most of all, have fun.

Angler Education
Oregon Sport Fishing Regulations Worksheet

Give this worksheet to students during the first Angler Education session so they have time to complete it before the fish crew arrives to conduct the second Angler Education session. During the second session, the fish crew may use this worksheet as a guide to ensure students have learned general angling regulations, catch and possession limits, safety, and special regulations. The fish crew also covers fish identification, knot tying, fishing dilemmas, and map reading skills. *Allow two hours for the fish crew to conduct their session.*

The Table of Contents is on Page _____.

General Regulations

1. Why do we have Sport Fishing Regulations? _____

Licenses, Tags, and Permits Page _____

1. How old are you? _____
2. Do you need a fishing license? _____
3. What is a tag? _____
4. Do you need a tag to fish for salmon, steelhead, sturgeon, or halibut? _____
5. How much does this tag cost? _____
6. When you reach 14 years old, how much will a fishing license cost? _____
7. How much will a license cost when you are 18 years old? _____

Catch and Possession Limits Page _____

1. What is a daily limit? _____
2. What is a possession limit? _____
3. What is a size limit? _____

Definitions Page _____

1. What is an adipose fin? _____
2. Why would hatcheries clip this fin? _____
3. What is angling? _____

4. What is fly angling? _____
5. What is bait? _____
6. What is a lure? _____
7. What is an artificial fly? _____
8. What is chumming? _____
9. What is a barbless hook? _____
10. When would you use a barbless hook? _____
11. What are game fish? _____
12. What is snagging? _____

Gear, Bait, and General Restrictions Page _____

1. Is it legal to transport live fish or live eggs between bodies of water? _____
2. Can I use live fish as bait? _____
3. Why not? _____
4. You catch some fish and want to give some of the fish to a friend to take home. Is there anything you can do to make this legal? _____
5. Can you use more than one fishing rod at a time? _____
6. Can you catch part of another person's catch limit? _____
7. What is wasting fish? _____
8. What do you need to fish on private land? _____
9. Is it legal to chum? _____
10. Is it legal to angle for the same type of fish after taking or retaining a catch or possession limit? _____

Hook and Weight Regulations Page _____

1. How many hooks can you use to fish? _____

Harvest Methods, Hours, and Restrictions Page _____

1. What method(s) may be used to catch game fish? _____

2. Crayfish? _____

3. Carp? _____

4. Smelt? _____

5. What are the legal hours to angle for salmon, shad, steelhead, sturgeon, trout, or whitefish?
   _____

6. Where must game fish be hooked? _____

The Central Zone (Map is on page _____)

General Regulations Page _____

1. What is the catch limit for trout in lakes? _____

2. Streams? _____

3. What is the minimum length for trout? _____

4. How many trout over 20 inches may be kept? _____

5. How many brook trout may be kept from streams? _____

6. When are lakes open for fishing? _____

7. Streams? _____

8. Can you use bait in streams? _____

9. What is the daily limit for largemouth and smallmouth bass? _____

10. What size? _____

11. What is the limit on bluegill, catfish, crappie, other sunfish, walleye, and yellow perch? _____

12. Whitefish? _____

13. Carp? _____

14. Crayfish? _____

Special Regulations

Certain waters within the Central Zone have Special Regulations. On which page are the Special Regulations? _____

The **fish crew** involves students in map reading by having students locate the following areas on maps in the *Oregon Sport Fishing Regulations*:

1. Lake Billy Chinook, the Metolius Arm
2. Browns Creek
3. Crane Prairie Reservoir
4. Cultus Lake
5. Davis Lake
6. Deschutes River-Lake Billy Chinook upstream to Benham Falls
7. Deschutes River-Benham Falls upstream to Wickiup Reservoir
8. Deschutes River-Crane Prairie upstream to Little Lava Lake
9. East Lake (Health Advisory)
10. Lava Lake
11. Prineville Reservoir
12. Shevlin Pond
13. Squaw Creek
14. Tumalo Creek
15. Twin Lake, South
16. Twin Lake, North

Other Information

Have students find information on the following topics **before** the classroom presentation:

1. Bull trout and brook trout identification
2. Catch and release
3. Freshwater fish species
4. Health advisories
5. Salmon identification