



Kokanee Karnival Youth Education Program

Fall Streamside

Browns Creek and Fall River Hatchery Curriculum

Introduction

This document is Part 4 Incredible Journey Curriculum of the Browns Creek Section. Volunteers will set up this station at the site near where kokanee are spawning. Materials needed for this station include:

- Incredible Journey stand up display showing Circle of Life and development hazards and the associated materials;
 - Circle of Life attachments
 - Hazards of Eggs Developing into Spawning Fish attachments
 - Fate cards
- Kokanee Building a Redd laminated 11x17 demonstration sheet;
- Two Kokanee on a Redd laminated 11x17 demonstration sheet;
- 2 Kokanee examples silver lake and red spawning, laminated printed fish;
- Wood rack with 4 glass vials with eggs, eyed eggs, alevin and fry.
- Polarized glasses

Part 4 of the curriculum contains the following information:

- A. Spawning
- B. Circle of Life
- C. Hazards Of Egg Development Into Spawning Fish
- D. Time Saving Suggestion

The instructors should monitor their time at this station. As a general practice, each station will be allocated 20 minutes. Sometimes this can be extended to 25 minutes but often due to bus the arrival and departure, less time is available at each station is less than 20 minutes. You need to be prepared to modify your presentation to fit in the allotted time. A suggestion of how to modify the presentations at this station is given at the end of this curriculum. *Experience has shown that this is the station at Browns Creek that tends to run over the allotted time.* If you try to allocate 8 minutes for each of the three parts you will take too long.

When the students arrive at the station you should introduce the Kokanee Karnival volunteers. This helps let the students know that you are the instructors and are in charge. If the kokanee are present show them to the students. Hand out polarized glasses for better viewing. Point out the different sizes, colorations, and positions of the Kokanee in the stream. Also point out the dead and dying fish on the stream sides (if they are present).

Have the students sit on the log in front of the display. Most groups will have 8 to 10 students. You will need 10 participants for the Hazards of Egg development game. In some cases it may be necessary to have the teacher and or parent chaperones participate to have 10.



A. Spawning

Tell the students we are now going to talk about kokanee spawning. Tell the students that kokanee are landlocked salmon and ask if they know what landlocked means. Some may know but you may have to explain it. You can tell them that if these kokanee salmon had access to the ocean instead of having their path blocked by dams (manmade or natural) they would migrate to the ocean, traveling as far north as Alaska, putting on a lot of weight while feeding constantly. Tell them that if kokanee could go to the ocean they would be called sockeye salmon.

Ask the students if they know what a salmon's nest is called. You may have to give a hint by saying it is like a color. Some will know it is a redd. Show them the two kokanee examples and ask if they know which one is the spawning kokanee. You may want to tell them the difference between the silver and red kokanee (show laminated pictures). You can tell them that throughout most of their lives, kokanee are very bright, shiny, silvery fish with a dark back. This gives them camouflage from predators. But as the kokanee matures 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. Ask them if they know the difference between a male and female kokanee. The male develops a pronounced hook jaw and the teeth enlarge (kype). Tell the students that kokanee never eat again once they leave the lake. If they do not eat, what are the hooked jaw and big teeth used for. Some of the fish become very dark, especially as they complete spawning and are near death.

Use the two 11x17 sheets to demonstrate how the Kokanee build the redd and then spawn. You can tell them the female Kokanee expels some of her eggs, and as she does this, the male expels milt which fertilizes the eggs. The eggs fall to the bottom of the redd as they are heavier than water, and because they have a sticky covering they stick to the gravel in the redd. After she has expelled the eggs and they have been fertilized, she moves to the forward part of the redd and begins to fan gravel again with her tail to bury the eggs. After the Kokanee are done spawning, both they will die within a few days. But life is starting over again in the eggs she has laid.

You can then take the wooden rack and show them the four stages of development. First they are eggs and then eyed eggs. Tell the students the growth and development depend on water temperature. The colder the water, the slower the development. *Remind them they will see this development when they get trout eggs in the incubator in their classroom.* Ask the students what the kokanee are called when the eggs hatch (alevin). You can tell them the eggs take about 6 weeks to hatch. It may help to tell them the eggs laid now will hatch around Thanksgiving, this gives them a time perspective. Tell them the alevin are not mature and live in the gravel for a few weeks. Ask them what does an alevin have to eat while it lives in the gravel (egg or yolk sack). Tell them the alevin live in the gravel for 3 weeks. Ask what the alevin are called when they come out of the gravel (fry).

Significant Vocabulary.

- Landlocked
- Kype = lengthened and deformed lower jaw of a spawning male salmon to drive off other males
- Redd
- Eyed egg
- Alevin



- Fry

B. Circle Of Life

The Circle of Life poster on the stand up display shows several stages in the life of a Kokanee. There are several round attachments with Velcro to use with this display. *Often instructors say very similar things in the Circle of Life presentation as they do in the Hazards of Eggs Development game.* Take care because time is limited so try not to be redundant.

Tell the students the kokanee have the urge this time of year (autumn) to return to the stream in which they were born to spawn. This is what salmon do surviving many perils on the way — perils such as predators (birds, bears and seals), sport and commercial fishermen, waterfalls, and dams.

Ask the students how many eggs they think the female kokanee has, the range of guesses will vary widely. Ask if they think all the eggs will hatch and grow into adult salmon. Put the 1000 egg circle on the poster. Ask the students what they think can happen to the eggs and again the answers will vary. Quickly tell them about eggs being eaten (crayfish or sculpins), smothered by silt, pollution, squashed if people wade on the redd. Then put up the 800 circle and ask what can happen to the fry. Let them make suggestions about predators, herons, kingfishers, other fish. Tell them why their guess of bears and eagles may not be true at this stage of the Kokanee life (they are too small) but to remember this for later. Put the 500 fingerling circle on the chart and ask if all the fingerlings will make it to the lake, if not what may happen. Let them guess about predators. Reinforce that of the 1,000 eggs half have died and only 500 are left. Now put the 200 adult fish circle on the chart and tell the student the Kokanee are in the lake. Ask if they are safe and what are predators, eagles, osprey and people fishing. Put the adult symbol on the poster and show that of the 1,000 eggs maybe only one survives to come back to spawn. What can happen to them as they swim up the river, predators bears, eagles, osprey raccoons.

This is also a good time to review how the 1000 eggs provided food for other animals throughout the life cycle. Ask what happens to the salmon when they die (remain in stream) and if this is good or bad. Tell them how the bodies feed bacteria and bugs that are food for other fish as well as the fry and fingerlings. Without the decomposing bodies the young salmon would have no food.

Significant Vocabulary.

- Spawn = laying eggs and depositing milt (sperm)
- Sediment or silt= small particles of earth, clay, sand, or similar matter
- Migrate = to move from place to another
- Salmonid = a family of fish that include salmon and trout
- Alevin = stage of a fish that carries an egg sack
- Fry = small fish that feed mainly on zooplankton

C. Hazards Of Eggs Developing Into Spawning Fish



This is a game that the students really like to play. *Watch your time in this game to make sure you stay within the allotted time.* You need 10 players, ask teachers and chaperones to participate to make 10. Watch your time because this often takes 8 to 10 minutes to complete. Remind the students that not all the eggs will make it to be a spawning adult. Ask the student who they think will make it to the end and why; common answers are they are smart, fast, cool, lucky.

Give each play a 100 egg circle and have them put it on the poster starting from the bottom. It is efficient if one instructor talks and the other hands out the circles and Fate cards. When they are done give each player an EGG FATE card. Tell them not to turn the card over until you say go. Eight will survive. The students who survive get real loud and excited. It is important to calm them down so the game can proceed. Ask who did not survive and why. It is good to make sure the teacher or chaperones get the “did not survive cards.” Then give the 8 students who survived the fry cards and have them put the circles on the poster above the eggs. Hand out the FRY FATE cards. Again tell them not to turn them over until you say go and then ask who did not survive and why. Only 5 will survive. Hand out the fingerling circles to the 5 survivors and have them put the circles on the poster above the fry circles. Hand out the FINGERLING FATE cards and again tell them not to turn them over until you say go. You will have 2 survivors, ask those who did not survive why they did not make it to adults. Give the 2 remaining students the adult circles and have them put them on the poster and to stand near you. Mix the two ADULT FATE cards behind your back and ask one student to pick right or left hand. Give each a FATE card and see who survives. Ask the one who did not survive what happened and have the survivor put the fish circle on the top of the poster.

This is a good time to remind the students what they said at the start of the game about who would survive and why. Ask what they think really controlled who survived and who did not. Many will agree it is luck.

This completes this station at Browns Creek for this group. One instructor should guide the students up to the road and wait for the next group while the other instructor takes all the circles off the two posters and gets ready for the next group.

D. Time Saving Suggestion

If a reduction in presentation is needed due to the bus schedule, it is suggested that you eliminate the Circle of Life presentation, however you should combine the information with the Hazards of Eggs Developing game. The game really impresses the information on the students and is more significant than the Circle of Life presentation.