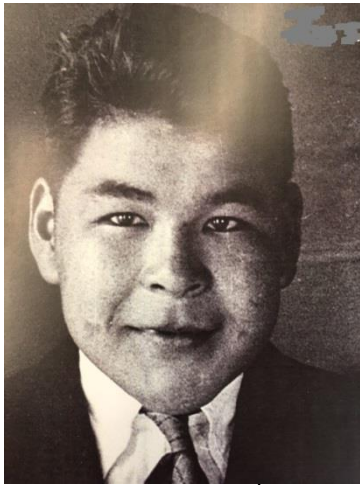


**FOOD FROM THE SEA: SALMON CYCLE GR: 3-5 (LESSON 7-9)**

**Elder Quote:** “Salmon was put up in many ways: smoked or air-dried, and cut up in little pieces and stuffed in a seal or sea lion stomach which had been dried, it was also salted. There is a little fish that you find under the rocks, we ate them while hunting. You find a rock which you can turnover and you generally will find a fish under it.

They would smoke and dry the salmon after it came up the streams to spawn, it is not fat and it had to stop eating. The bright salmon are fat molds and turns rancid. But the ones from the streams have lost most of the fat, you smoke or dry them they get hard as a board.”



Bobby A. Stamp (Born in 1926 to a French Canadian father and Dorothy Vlasoff from Nuchek. He moved to Chenega at the age of seven where he lived a subsistence lifestyle and was taught cultural values and lore by the village Elders. He died in 2005.)

(Bobby Stamp p.8)<sup>1</sup>

**Grade Level:** 3-5

**Overview:** Abundant salmon runs attracted the first settlers to the Chugach region. Careful observation of the timing and locations of the salmon life cycle stages allowed the Sugpiat and Eyak people to efficiently harvest and prepare them for consumption.

**Standards:**

<i>AK Cultural:</i>	<i>AK Content:</i>	<i>CRCC:</i>
D1: Acquire in-depth cultural knowledge through active participation and meaningful interaction with Elders.	Science C (2): A student should understand and be able to apply the concepts, models, theories, facts, evidence, systems, and processes of life science and should (2) develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms.	L1: Students should understand the value and importance of the Sugt'stun language and be actively involved in its preservation.

**Lesson Goal:** To understand the salmon life cycle and how the Sugpiat and Eyak people harvested and incorporated salmon into their traditional diets.

**Lesson Objectives:** Students will:

- Research the life cycle of the salmon.
- Research traditional salmon harvest methods.

- Research traditional subsistence salmon recipes.
- Learn to pronounce the Sugt'stun and/or Eyak vocabulary

**Vocabulary Words:**

Sugt'stun Dialects

English:	PWS:	Lower Cook Inlet:	Eyak:
red (sockeye) salmon	<i>nikliq</i>	<i>nikliq</i>	<a href="#"><i>cha'ch</i></a>
king (chinook) salmon	<i>luqqakaq</i>	<i>luqqakaq</i>	<a href="#"><i>te'ya'lee</i></a>
silver (coho) salmon	<i>qakkíyaq</i>	<i>qakkíyaq</i>	<a href="#"><i>AdAte'ya'</i></a>
dog (chum) salmon	<i>alimaq</i>	<i>alimaq</i>	<a href="#"><i>tiitl'</i></a>
humpy (pink) salmon	<i>amahtuq</i>	<i>amahtuq</i>	<i>giyah sdilahL kaashk'</i>

**Materials/Resources Needed:**

- Access to a computer projection screen
- Poster board (one per student group), markers, construction paper, tape
- FFS 35 Salmon Cycle.4.1 Food Memories (See below)
- FFS 35 Salmon Cycle.4.2 Project Guidelines (See below)
- FFS 35 Salmon Cycle.4.3 Life Cycle (See below)

**Kit Library:**

- Chandonnet, Ann, *The Alaska Heritage Seafood Cookbook*.
- DeCourtney, Christine A., et al., *Traditional Food Guide for the Alaska Native People*.
- Miller, Debbie S., et al, *A King Salmon Journey*.
- Smelcer, John E. and Morgen A. Young. *We Are the Land We Are the Sea: Stories of Subsistence from the People of Chenega*
- Stamp, Bobby A. *Chenega as I Saw It – It's people*.
- Stewart, Hilary. *Indian Fishing: Early Methods on the Northwest Coast*.
- Tabios, Derenty, et al. *Looking Back on Subsistence: Interviews with Elders of the Chugach Region*.
- Unger, Suanne. *Oaqamiigux: Traditional Foods and Recipes from the Aleutian and Pribilof Islands; Nourishing Our Mind, Body and Spirit for Generations*.

**Web Resources:**

- Pacific Salmon Migration Routes  
[https://www.google.com/search?rlz=1C1GGRV\\_enUS752US752&biw=1920&bih=974&tbm=isch&sa=1&ei=AIVFWsTPLePj0gKsiojYDw&q=Alaskan+salmon+migration+patterns&oq=Alaskan+salmon+migration+patterns&gs\\_l=psy-ab.3...5145](https://www.google.com/search?rlz=1C1GGRV_enUS752US752&biw=1920&bih=974&tbm=isch&sa=1&ei=AIVFWsTPLePj0gKsiojYDw&q=Alaskan+salmon+migration+patterns&oq=Alaskan+salmon+migration+patterns&gs_l=psy-ab.3...5145)

- Pacific Salmon Migration Routes <http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/salmon-saumon/facts-infos/index-eng.html> Salmon Facts including salmon species migration routes
- Salmon Life Cycle Stages “The Odds” <https://scienceandmemory.uoregon.edu/the-odds.html> (5:23) Time lapse photography of Artist’s watercolor rendition of salmon life cycle
- Salmon Life Cycle Stages [http://www.adfg.alaska.gov/index.cfm?adfg=fishinggeneconservationlab.generalinfo\\_salmon\\_story](http://www.adfg.alaska.gov/index.cfm?adfg=fishinggeneconservationlab.generalinfo_salmon_story) Salmon Life Cycle Stages Graphic with Descriptions
- Salmon Life Cycle Stages <https://www.fws.gov/alaska/cybersalmon/coho.htm> Salmon Life Cycle Stages with Descriptions
- Salmon Life Cycle Stages <https://www.fishex.com/salmon/alaska/salmon-life-cycles> “The Fascinating Life of an Alaskan Salmon” Salmon Life Cycle Stages with Descriptions
- Salmon Life Cycle Stages [http://www.adfg.alaska.gov/static/education/educators/curricula/pdfs/salmon\\_in\\_the\\_classroom\\_unit\\_1\\_overview.pdf](http://www.adfg.alaska.gov/static/education/educators/curricula/pdfs/salmon_in_the_classroom_unit_1_overview.pdf) pp.4,5 Salmon Life Cycle Stages Descriptions & Ocean migration routes by species; pp.6,7 Salmon Life Cycle Needs and Threats; p. 10 Salmon Life Cycle Drawings
- Salmon Life Cycle Stages <https://www.streamnet.org/wp-content/uploads/2014/10/Interactive-Salmon-Life-Cycle.pdf> Salmon Life Cycle Descriptions

### **Teacher Preparation:**

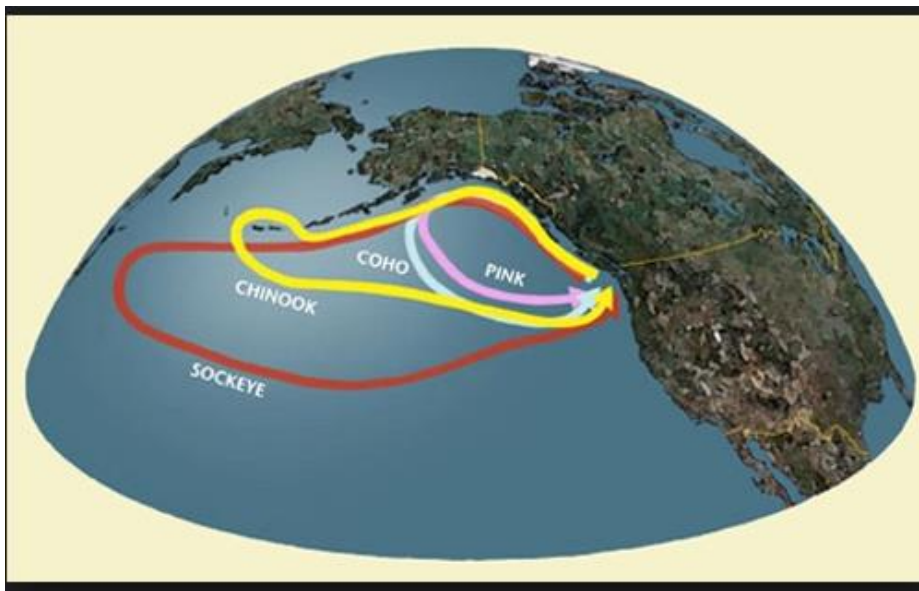
- Review Activities and practice Sugt’s tun or Eyak vocabulary.
- Google ‘Alaska Salmon Migration Routes’ and select an image of Alaskan Salmon ocean routes to display on the computer projection screen.
- Determine how many classes will be needed for students to research and make their salmon posters.
- Contact your Local Education Coordinator or local Tribal Council for a list of Elders that could share his or her expertise on traditional salmon fishing techniques and recipes.
- Before the Elder or Recognized Expert arrives review with students how to interact respectfully with the Elder during his or her visit.

**Opening:** The Sugpiat and Eyaks settled here along the coast thousands of years ago attracted by the richness of the local resources, especially the abundant salmon runs. Our Alaskan salmon are now famous around the world for its fine flavor and healthful properties. Do you know where to find salmon around here? When and how do you catch them?

## Class Activities:

### Class 1

1. Introduce the Elder to students and invite him or her to describe the five species of salmon, talk about local salmon fishing grounds, traditional ways of catching salmon (before motorized transport), and how harvest techniques have changed over time.
2. Briefly discuss salmon life cycle and migration from stream to ocean and back. List five species of salmon on the board and invite the Elder to help pronounce their Sugt'stun and/or Eyak names. (*See vocabulary listed above.*) Point out that the Sugpiat and Eyak were so attuned to the characteristics of the five species of salmon that their languages have no single word for just salmon.
3. In Sugt'stun May is *Niklit, Tanqiat* (LCI & PWS) or Red Salmon Month; June is *Alimat Tanqiat* (LCI)/*Alngahtuliq Tanqiat* (PWS) or Chum Month; August is *Amahtut Tanqiat* (LCI)/*Amehtumpiat Taiqiat* (PWS) or Pink Salmon Month; and Sept. is *Qakkiyat Tanqiat* (LCI)/*Cuqlihpam uksuam tanqia* (PWS) or Silver Salmon Month.
4. Display salmon species migration routes. Discuss when the salmon are easier and harder to harvest. (*Too hard to find in open ocean. Without motorized transport salmon harvested close to shore or in stream.*)



Discuss which of the salmon life stages were traditionally used by the Sugpiat or Eyak. (*Eggs – plentiful, easily harvested/Alevin – too small, no/Fry – too small, no/Parr – no/Smolt – eaten/Ocean-going Adults – too dispersed, too far away; Returning/Spawning adults – eaten, easily harvested*)

5. Read *A King Salmon Journey* aloud. Ask students to list the challenges the returning salmon face as they swim to their natal streams (*drift net; fish wheel, dip net -pictured p.26, paddle wheeler, different tributaries, silt, predators like bears, eagles, ravens, foxes...*)
6. Explain the project: Students will spend two to three (*teacher's option*) classes to research the life cycle of the salmon and the ways in which salmon were harvested and then eaten in the traditional subsistence lifestyle of the Sugpiat and/or Eyak. Their research will include interviews with family members and/or Elders about their subsistence salmon harvests and

- uses. Students will create original posters to display this information. Students will share their research results with the class as part of the final lesson, FFS 35 *Guest Chef Chowder*.
7. Review kit library resources and assign students to small groups. Distribute Project Guidelines (FFS Salmon Cycle 4.2 Project Guidelines) and direct students to divide up the project work.
  8. Assign family salmon subsistence interviews as homework. Share the following quote as an example of what can be learned from interviewing Elders.

*“Somebody gave me some salmon eggs and I didn’t know what to do with them. Could you show me?”*

I wouldn’t advise you to use them after they have been frozen. I tried that. I tried freezing salmon eggs and I tried cooking them. They just got mushy and they were just yucky. They are just no good for anything. If they were fresh you could boil them. If you got the eggs out of a salmon and put them in a bowl for two or three hours they would get hard. You could bounce them on a table like Ping-Pong balls. After that you just put salt on them. I have seen people eat them raw with just salt. I do too. I eat them. My grandchildren tried that. I don’t know if they liked it but they ate it. They like the boiled salmon eggs. You take the heart of the salmon and put it in with the fish eggs and boil them.

*What is your favorite way of eating salmon?*

I don’t really have a favorite way. I eat them any way, every way. I eat a lot of salmon and I process it every way. I boil it. Fry it, kipper it, smoke it. I noticed this morning these two grandchildren’s mother must have had salmon from fishing the flats. I noticed that they are smoking. They got a little smoker. I am glad that when I pass on they will know what to do. I sowed Daryl. I said, “You’re doing it wrong. Your smokehouse is altogether wrong. It doesn’t have a draft and he’s not putting the wood in the way it is supposed to be. The fish are all right. They are all hung nice. I am really pleased the way they put the fish in there. In fact, in a couple of days, if they keep it up, they will be ready to bake in the oven. Two or three days of smoking and they will be ready to bake in the oven. I told him if they don’t put any heat in that now, it’s cold, the fish are going to sour. You gotta have heat with your fish now. It’s getting cold. It’s a lot of work to put up fish. You gotta have heat, smoke. They have new smokehouses now. You have a pipe with the smoke on it. I prefer the old ways where I just had an old fifty-gallon drum, out fourth-ways, and had a two-layer fish hanging up, and have some alders to smoke the salmon.”

- Jessie Tiedeman<sup>ii</sup>

## **Class 2**

1. Briefly review interview results. Distribute and share Elders’ memories of food from the sea (FFS Salmon Cycle 4.1 Food Memories) and discuss.
2. Show “The Odds” (5:33) <https://scienceandmemory.uoregon.edu/the-odds.html> Time lapse of artist’s narration and rendition of salmon life cycle.
3. Distribute Salmon Life Cycle descriptions (FFS Salmon Cycle 4.3 Life Cycle Descriptions)

4. Remind students that their posters should match subsistence recipes with the salmon life stages. Students may use recipes from their interviews, handouts, or heritage kit cookbooks. *Note: there is some variation in how the life cycle stages are labeled. For purposes of recipe matching it is useful to have both returning adult salmon and spawning salmon.*
5. Review Science Poster prompt guideline on Heritage website.
6. If time, students may draft poster design.

### **Class 3 (& Class 4)**

1. Distribute poster materials.
2. Conclude research.
3. Review guidelines and create poster.

### **Assessment:**

- Students created an original informational poster of the salmon life cycle and harvest methods.
- Students identified the salmon life stages and their uses in subsistence recipes.
- Students correctly pronounced the Sugt'stun or Eyak vocabulary words.

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<sup>i</sup> Stamp, Bobby A. *Chenega as I Saw It—It's People*. Chugach Alaska Corporation, 2010. p.24.

<sup>ii</sup> Interviewed by Daryl Kramer, *Out of Our Time, the Storytellers Oonechguk Edowchu*. Cordova Baptist Press, 1980. p.66. (Out of print)



### FFS Salmon Harvest Cycle 4.1 Traditional Food from the Sea Memories

#### **Quotations:**

ROE/SPAWN “They would also put up spawn when it was still whole. Then they put it in dried seal or sea lion stomachs and kept it in the smoke house. Spawn was smoked by hanging it over sticks in a smoke house until it turned hard and gummy.

In the olden says they fought a lot. I was told that when the village was being attacked by another clan that they fed spawn to the children. If you have not eaten any it would be like a mouth full of taffy, you can’t speak, it would stick to the roof of your mouth and teeth that is why they fed it to the children so they would not scream or talk.

The *Penuk* was eaten with berries, which were picked and stored in seal oil. They put all kinds of berries and *penuk* together and it was call *A goo duk*. Salmon spawn is called *Penuk*. The salmon spawn was taken from the salmon when they were in the streams and ready to spawn and put in a dish pan and you had a paddle that looked like this.

It was called *Chee duk*, an Aleut word for it was “squash tool” or “mash tool”. It was rounded and you worked it in a rotary motion and it mashes the spawn and after the spawn was mashed you take it to a cold stream, you have the water running around the pan and you stirred it until it got thick and it was set in a warm place and all the shells from the eggs came to the top and the am amount of cooked spawn was added...”

Bobby Stamp, *Chenega as I Saw It – It’s People* p.25

CAMPS “In the early days we had summer camps, fall camps and spring camps. In early spring when the snow left the ground, it was bear that we went after. At the same time, we would get bidarkis (chitons) and seaweed. We also fished cod and dried it. Salmon was caught and then buried about the half way mark of the tide. We would dig them up and eat them. They were usually green; I guess everybody liked them and supposed to be good so I guess I followed them.”

Bobby Stamp, *Chenega as I Saw It –It’s People* p.27

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FISH CRICK:” We would go into the salmon streams and get the fish. We always had salmon growing up. We went in to the salmon streams which we simply called “fish cricks.” My grandma always wanted the ones with the biggest humps. You cut off the nose-and-hump portion, put some salt on it, and eat it, which is called *kazaq*. We would also get the loose eggs from the female salmon. We called the eggs “beebles.” I don’t know where the term came from; I just grew up calling them beebles. We would rinse them out, put them in cold water with lots of salt, and let them sit in the fridge overnight. They get real crunchy. I can’t eat them anymore. The taste is just too fishy for me now. But when I was little I would eat them like they were going out of style.”  
Donia Abbott, *We Are the Land We Are the Sea*, p.4

BEEBLES: “I remember how every summer around August we would wade in the creek and catch salmon with our hands and squeeze the females to get their eggs out. We call them beebles. We’d take a couple of buckets and our nets and go down to the creek in Valdez. We’d catch as many fish as we could to fill the buckets with fish eggs, and then we’d take them home. We’d clean the beebles, soak them in water, and then refrigerate them overnight, which would make them hard. You’d know the eggs were ready when they bounce on a table like a ball. The we drain them and salt them.”

Tanya Pipkin, *We Are the Land We Are the Sea*, p.88

FERMENTED FISH EGGS “They used to make these spoiled fish eggs. My Uncle Jack had a dried, blown-up seal stomach in his shed. They’d put the fish eggs in there and make them like Limburger cheese, totally rotten and smelly. Then they’d put them on a plate and mix in blueberries and eat it. I couldn’t do it.”

Avis Kompkoff, *We Are the Land We Are the Sea*, p.43

FISH HEADS: “I really like boiled fish heads. You can boil them and eat everything except the gills and bones, or you can eat the part on top of the fish head, the skin, and part of the nose where the bone is soft cartilage. That’s really good. And you can eat the cheeks. They used to cut the hump off a pink salmon and eat it raw with salt water. Seawater has just the right amount of salt. You eat it right on the creek, right on the beach. . . . I really miss all the old ways of eating, like eating *sulunaq* and boiled fish heads and fresh clams right off the beach. I remember how we’d go out and dig them and clean them and then cook them that night for supper. We used to eat black bear, seal, sea lion, and porpoise. Porpoise meat is real black, but I like it. I like the skin. Too. I quit eating saturated fats, but I really like a little bit of seal oil with dried fish. Some elders like it rancid. My Aunt Diane likes it that way.”

Paul Timmy Selanoff, *We Are the Land We Are the Sea*, p.106

**Books:**

Tabios, Derenty. *Looking Back on Subsistence Interviews with Elders of the Chugach Region*, (S. P. Wassilie & L. Lofquist-Taylor, Eds.). Chugachmiut Corp., 2000. (Salmon: pp.6-9, 24-25)

*Neq’rkat: The Wild Foods Cookbook*, Alutiiq Museum and Archaeological Repository, 2014.



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**FFS 35 Salmon Harvest Cycle 4.2 Life Cycle Project Guidelines**

Name(s) \_\_\_\_\_

**Class 1** – In your research group decide....

Which species of salmon to research: \_\_\_\_\_

Who will research salmon life stages: \_\_\_\_\_

Who will research salmon harvest methods: \_\_\_\_\_

Who will review search traditional subsistence salmon recipes: \_\_\_\_\_

Who will review interview results for info to use on poster: \_\_\_\_\_

Who will find/create poster artwork for Salmon Life Stages & harvest methods: \_\_\_\_\_

Share and explain the poster to the class (at least 2 students):

\_\_\_\_\_ & \_\_\_\_\_

**Homework:** Interview an Elder or other family member about salmon harvest and use.

What do they remember about ways to harvest, process, and eat salmon?

How was salmon traditionally harvested and eaten and how is it done today?

How did they learn to harvest and prepare salmon?

What is their favorite salmon recipe? Which salmon species do they eat most often?

**Classes 2 & 3 – Research, Poster Creation**

(See also Chugachmiut Heritage Website Science Poster prompt for more guidelines.)

Each poster should contain:

\_\_\_\_\_ Salmon species label in English and Sugt'stun or Eyak

\_\_\_\_\_ Salmon life cycle illustrations

\_\_\_\_\_ Each life stage should be identified with a brief physical description and where found

\_\_\_\_\_ At least 3 Harvest Method Illustrations with brief explanations of which life cycle stage they targeted

\_\_\_\_\_ At least one salmon recipe for three of the salmon's life cycle stages (The recipe should indicate what type of salmon is used - both in English and Sugt'stun or Eyak, whose recipe it is and where it originated, if known.)

*Posters will be judged on fulfillment of the guidelines; organization and clarity of information presented; and artistic qualities.*

**Final Class – Presentation**

Team members will briefly present poster information to class using both English and Sugt'stun and/or Eyak words for the species of salmon described.

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## FFS Salmon Cycle 4.3 Life Cycle Descriptions

Salmon Life Cycle <https://www.nps.gov/olym/learn/nature/the-salmon-life-cycle.htm>

### 1 & 2: Eggs & Alevins

The cycle begins in freshwater, when a redd, or a female's nest of eggs, is fertilized. These eggs remain in the gravel throughout the winter, and the embryos develop. In the spring, the eggs hatch and alevins emerge. These are tiny fish with the yolk sac of the egg attached to their bellies. Alevins stay close to the redd for a few months. When they have consumed all of the yolk sac and grown in size, these fish emerge from the gravel, and are then considered fry.

### 3: Fry

Fry swim to the surface of the water, fill up their swim bladders with oxygen, and begin to feed. Depending on the species, fry can spend up to a year or more in their natal stream. Upon emerging from the gravel, both [pink](#) and [chum](#) are already silvery smolts, and head directly to sea. [Sockeye](#) fry tend to migrate to a lake, spending 1-2 years before migrating to sea. [Chinook](#) fry usually spend less than 5 months in freshwater, while [coho](#) fry may spend over a year. The survival of fry is dependent upon high-quality stream habitat. Boulders, logs, shade, and access to side channels is important in allowing fry to hide from predators and prevents them from getting flushed downstream during flood river-flows.

### 4: Seaward Migration

Eventually, environmental cues cause fry to begin their migration downstream towards the oceans. At this time, smolting begins, and scales grow as they turn a silvery color. At night to avoid predators, small fry (or developing smolts) allow the river to take them tail-first downstream while larger fry swim actively towards the ocean. Estuaries, at the mouth of the river, are crucial to the survival of young smolts. While allowing their bodies to adjust to the new conditions, they feed heavily, hoping to ensure survival in the ocean.

### 5: Ocean Life

While some salmon remain in coastal water, others migrate northward to feedings grounds. Salmon may spend one to seven years in the ocean. Certain species have more flexible life history strategies, while others are more rigid. Coho may spend up to seven years at sea, but typically four. Pink salmon, on the other hand, spend a fixed 18 months at sea. Sockeye typically spend two years at sea, coho spend about 18 months, and chinook can spend up to 8 years before journeying back to their natal streams to spawn.

### 6: Spawning Migration

It is unsure as to how exactly salmon detect their natal streams, though it is suspected that scents and chemical cues, as well as the sun, play an important role in the homeward migration. Once the salmon reach freshwater, they stop feeding. During the course of the journey, their bodies instinctively prepare for spawning. The taxing journey draws energy from their fat storage, muscles, and organs, except for the reproductive organs. Males develop hooked noses, or kype, in order to fight for dominance.

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### 7 & 8: Spawning & Death

Upon reaching natal streams, females build nests, or redds. These little depressions in the gravel are made by the female by turning on her side and using her tail to dislodge stones or pebbles. Males fight with other males for spawning rights with a female. The dominant male will court the female and upon spawning, they release eggs and milt simultaneously. The eggs will settle into the gravel, and the female will cover the eggs with loose gravel and move upstream in order to prepare another redd. Eventually, both the males and females die, supplying the river habitat with nutrients and the seeds of the next generation that will someday return to continue the cycle.

