## 2.3 Local Pacific Salmon Species

### Subject
Life Science

### Objectives
The students will:

- Know names and facts about the five Pacific salmon species
- Complete the Pacific Salmon Species of Whatcom County chart

### Materials
- *Students for Salmon Journal* (print this section in color)
- Art Supplies—crayons, markers, pencils

### Size/Setting/Duration
Whole class/classroom/ ~60 minutes

### Background
After understanding the salmon’s anadromous life cycle, students are ready to learn about the differences between the five local Pacific salmon species. In addition to appearance, the five species have slightly different habitat requirements, including the season for spawning and the duration of time spent in fresh water and saltwater. There are many other species found locally that also belong to the family *Salmonidae* (also known as salmonids). We focus on Pacific salmon because they are considered the most culturally, ecologically, recreationally, and commercially important. Two other anadromous salmonids are the sea-run cutthroat trout and steelhead, a type of rainbow trout. These trout, unlike the Pacific salmon, do not die after spawning, and may spawn again multiple times.

### Procedure

1. There are several pages of information on salmon included in the teacher handbook as well as the *Students for Salmon Journal*—Salmon Facts (general information about Pacific salmon) and a fact sheet for each of the five Pacific salmon (Chinook, coho, chum, sockeye, and pink). Students should read these to familiarize themselves with the Pacific salmon found in Whatcom County.

2. Once the salmon fact sheets have been read, have your students complete the *Five Pacific Salmon Species of Whatcom County* chart. This chart addresses the scientific and common name, weight, length, and interesting facts about each species. All information to fill out the chart can be found on the different fact sheets.
### Next Generation Science Standards

<table>
<thead>
<tr>
<th>Performance Expectation</th>
<th>Scientific and Engineering Practices</th>
<th>Disciplinary Core Ideas</th>
<th>Crosscutting Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Asking Questions and Defining Problems</td>
<td>▪ LS1.A: Structure and Function</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Five Salmon Species of Whatcom County - Answer Key

<table>
<thead>
<tr>
<th>Species Name (Common and Scientific)</th>
<th>Weight</th>
<th>Length</th>
<th>Interesting Fact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinook Oncorhynchus tshawytscha</td>
<td>10-24 lbs.</td>
<td>36-58 inches</td>
<td>Answers for this column will depend on students.</td>
</tr>
<tr>
<td>chum Oncorhynchus keta</td>
<td>9-15 lbs.</td>
<td>25-40 inches</td>
<td></td>
</tr>
<tr>
<td>coho Oncorhynchus kisutch</td>
<td>6-12 lbs.</td>
<td>24-38 inches</td>
<td></td>
</tr>
<tr>
<td>pink Oncorhynchus gorbuscha</td>
<td>2-5 lbs.</td>
<td>20-30 inches</td>
<td></td>
</tr>
<tr>
<td>sockeye Oncorhynchus nerka</td>
<td>4-8 lbs.</td>
<td>25-33 inches</td>
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</table>
Pacific Salmon Facts

How big is the biggest salmon? The smallest?
The largest salmon is a Chinook, which can grow to be 58 inches (147.3 cm) long and 100 pounds (45.5 kg). The smallest salmon is the pink (3-5 pounds).

How fast can salmon swim?
A migrating sockeye salmon can swim for long periods at an estimated speed of one body length per second. For a 24 inch fish, the speed is 1.4 miles per hour. For short distances of burst swimming, the speed can be five or more body lengths per second, or at least 7.0 miles per hour. When swimming against a strong current in a river, the swimming speed can be less.

How high can a salmon leap?
Chinook, coho, and sockeye can jump as high as eight feet. Chum and pink salmon usually jump no more than three feet.

What predators eat salmon?
Juvenile salmon: larger trout, salmon, sculpins, squawfish, crows, northern pikeminnow, mergansers, osprey, kingfishers, terns, gulls, and other birds.
Adult salmon: eagles, gulls, seals, whales, halibut, dolphins, porpoises, wolves, and people.

Why do salmon turn different colors when they spawn?
Salmon lose their silvery color when leaving the ocean. The silver scales are absorbed and other skin pigments appear. Scientists think that spawning colors help salmon find members of their own species to mate with.

How does a salmon find its home stream?
Fisheries scientists believe that salmon navigate at sea with an inner magnetic compass. They can also sense day length, which lets them know when the seasons are turning as the length of day changes. As a migrating salmon approaches its home stream, its sense of smell comes into play and it follows the familiar smell of the stream it lived in as a juvenile. This migration back to
their home stream is a result of “home stream imprinting” that occurred as the juvenile salmon migrated to the ocean.

**Salmon are anadromous fish. What is an anadromous fish?**

Anadromous means that a fish spends part of its life cycle as a juvenile in fresh water where it was hatched, then migrates to the ocean to become an adult over a period of many months or years, and then returns to the fresh water to spawn and produce offspring.
Five Pacific Salmon Species in Whatcom County

Helpful hints to remember our Pacific salmon!

- **Chinook (King)**
  - The king of all fingers

- **Sockeye (Red)**
  - The finger you use to point to your eyesocket

- **Chum (Dog)**
  - Chum rhymes with thumb

- **Coho (Silver)**
  - You wear silver on this finger

- **Pink (Humpy)**
  - Like your pinky
Chinook

Also known as: Blackmouth, King, Spring, Tyee
Scientific Name: *Oncorhynchus tshawytscha*
Average Weight: 10-24 lbs (4.5-10.9 kg)
Length at Maturity: 36-58 inches (91.4-147.32 cm)
Status in Nooksack Watershed: Threatened

Chinook Life Cycle:

- There are two different types of Chinook in Whatcom County—Spring Chinook and Fall Chinook.
- Spring Chinook migrate upstream from April to July and spawn early August to September. Fall Chinook salmon spawn October to November.
- Spring Chinook spawn in the three forks (South, North, and Middle) of the Nooksack River and in a few larger tributaries (such as Canyon Creek).
- Fall Chinook spawn in the Nooksack’s upper main stem, the North Fork, and larger tributaries (such as Bertrand Creek and Fishtrap Creek). They also spawn in Whatcom Creek.
- Chinook may be three to five years of age at the time of spawning.
- Juvenile spring Chinook migrate to the estuary after several months in fresh water (they are known as ‘ocean type’ Chinook) or after one year in fresh water (‘they are known as ‘stream type’ Chinook). Fall Chinook are usually the ocean type, migrating to the ocean after several months.

Habitat Needs:
Chinook are most often found in rivers and occasionally in larger creeks. Spawning usually occurs in fast water side channels and main stem areas with fist-sized gravel.
Chum

Also known as: Dog, Keta, Calico, Silverbrite
Scientific Name: *Oncorhynchus keta*
Average Weight: 9-15 lbs, up to 40 lbs (4.1-6.8 kg, up to 18.1 kg)
Length at Maturity: 25-40 inches (63.5-101.6 cm)
Interesting Fact: Whatcom Creek in Maritime Heritage park is home to one of the largest recreational fisheries for chum in Washington State.
Status in Nooksack Watershed: Not warranted

Chum Life Cycle:

- Chum migrate and spawn in the mainstem, forks, and tributaries of the Nooksack River and in Chuckanut, Padden, Squalicum, and Whatcom Creeks between November and January.
- Chum may be three to five years of age at spawning
- The carcasses of chum are an especially important food source for bald eagles and this can be observed at sites along the Nooksack’s north fork.
- Chum rear in the freshwater for up to one month and then migrate to estuaries.

Habitat Needs:
Chum can often be found spawning where groundwater upwells through the spawning gravel. Upon entering the estuary, juveniles prefer tidal sloughs and small estuaries associated with the nearshore.
Coho

Also known as: Silver

Scientific Name: Oncorhynchus kisutch

Average Weight: 6-12 lbs, up to 31 lbs (2.7-5.4 kg, up to 14.1 kg)

Length at Maturity: 24-38 inches (61.0-96.5 cm)

Status in Nooksack Watershed: Not warranted

Coho Life Cycle:

- Coho migrate back to freshwater to spawn between October and January in the Nooksack River and its tributaries. Coho also spawn in the Dakota and California Creek watersheds, and in Terrell, Squalicum, and Whatcom Creeks.
- Juvenile coho usually spend at least one year in freshwater before migrating to the ocean. They usually spend two years in the ocean and return to spawn at the age of three years.

Habitat Needs:
Spawning coho are often found in small, lowland creeks not used by other salmon.
Pink

Also known as: Humpy, Humpback
Scientific Name: *Oncorhynchus gorbuscha*
Average Weight: 2-5 lbs, up to 12 lbs (1.0-2.3 kg, up to 5.4 kg)
Length at Maturity: 20-30 inches (50.8-76.2 cm)
Status in Nooksack Watershed: Not warranted

Pink Life Cycle:
- Pink spawn from August to September. At the time of spawning, pink are two years of age. Due to their short time spent in the ocean, pink are the smallest adult Pacific salmon. In the Nooksack, there are primarily odd year pink, meaning they will spawn every odd year (example: 2013, 2015, etc.), however there is a small population of even year pink (example: 2012, 2014, etc.).
- Pink salmon spawn in the Nooksack River and the larger tributaries of the Nooksack.
- After a few weeks, juveniles migrate from freshwater to the estuary. This means that of all five species of Pacific salmon, juvenile pink (as well as chum) are the least dependent on freshwater environments.
- In the summer, it is common to see schools of juvenile pink and chum salmon along the nearshore (area of the bay that is close to shore).

Habitat Needs:
Pink salmon often spawn closer to the sea than other species; sometimes they even spawn in the salty nearshore or in estuaries.
Sockeye

Also known as: Red, Blueback
Scientific Name: *Oncorhynchus nerka*
Average Weight: 4-8 lbs, up to 15 lbs (1.8-3.6 kg, up to 6.8 kg)
Length at Maturity: 25-33 inches (63.5-83.8 cm)
Status in Nooksack Watershed: Not warranted

Sockeye Life Cycle:

- Most sockeye spawn in the tributaries of a lake or along the lake shore at four years of age.
- The juveniles soon move from the tributary into the lake, where they spend one to two years before migrating to the ocean.
- There is no lake connected to the Nooksack River, however sockeye spawn in the North Fork of the Nooksack River.
- There are some sockeye, called kokanee, that stay in freshwater their entire lives instead of migrating to the ocean. Kokanee are present in Lake Whatcom, Lake Padden and Lake Samish.

Habitat Needs:
Most sockeye require the presence of a lake in their watershed. Sockeye have adapted to use lakes during the fry stage of their life cycle. However, sockeye in the Nooksack River have learned to survive without the need for a lake!
### Five Salmon Species of Whatcom County

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