

## Unit 4: Salmon Two

### Big Idea:

- Salmon harvest and management are closely linked to information gathered by biologists.

### Essential Questions

- How is biological information of salmon gathered?
- What can salmon scales tell biologists?
- What user groups harvest local salmon?
- What are commercial fishing methods used to target salmon?
- What is considered in setting harvest limits for salmon species?
- What are the implications of over-fishing?
- How can protein analysis be used to prove evolutionary relationships of salmon and other fish

**Vocabulary:** Subsistence, commercial, sport, recreational fishing, harvest limits, escapement, mortality, over-fishing, set-net, trollers, seining, biological sampling, age-scale analysis, fisheries management

### NGSS Priority Standards:

**HS-LS2-2** Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

**HS-LS2-6** Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

**HS-LS2-7** Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.\*

**HS-LS4-1** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

**HS-ESS3-3** Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

**HS-ESS3-4** Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.\*

**HS-ESS3-5** Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

**HS-ESS3-6** Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

### **Common Core Math and LA**

#### **Alaska State Standards Connections: ELA/Literacy -**

**RST.11-12.1** Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

**RST.11-12.2** Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

**RST.11-12.7** Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

**RST.11-12.8** Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.

**WHST.9-12.2** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

#### **Mathematics -**

**MP.2** Reason abstractly and quantitatively.

**MP.4** Model with mathematics.

**HSN.Q.A.1** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (

**HSN.Q.A.2** Define appropriate quantities for the purpose of descriptive modeling.

**HSN.Q.A.3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.