

TTCD Lesson Plan (15): Invasive Pike Video Lesson

Unit: Invasive Pike	Grade(s): 3-12	Class Size: 1-25	Lesson Duration: 45 minutes	Location: Classroom
Topic(s):	Salmon, invasive pike, population dynamics			
Student Prerequisites:	Students should have an understanding of the salmon life cycle, and have reflected on their personal and community connections with salmon.			
Essential Questions:	How do invasive pike impact existing salmon populations? What impact could invasive pike have on commercial and subsistence fisheries?			
Student Objectives:	Students will learn how invasive northern pike impact freshwater salmon habitat in southcentral Alaska. Students will understand how the pike life cycle encourages faster population growth than the salmon life cycle and what this means for the native salmon population.			
Standards:	Supports NGS Standards: 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. Supports Cultural Standards: E-2: Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them. Students who meet this cultural standard are able to: understand the ecology and geography of the bioregion they inhabit.			
Local Context:	Salmon hold cultural and economic significance in the community. Invasive pike threaten commercial and subsistence harvest.			
Vocabulary:	Salmon redd Alevin Fry Spawn predation			
Dena'ina language words:	<i>Added by TTCD or community partners</i>			
Materials:	• Computer • Projector • Set of cards with plausible adaptations on them			
Instructor Prep:	Download powerpoint to the computer you will use. Make sure the computer and			

	projector are compatible.
Introduction:	Present Powerpoint on pike and salmon life cycles. Salmon life cycle presentation should be a recap of previous lessons. Egg: Can take up to 30 days in cold climates. Ask: Do salmon eggs need more or less time to emerge? [More- all winter] Sac fry: Attach to plants while gaining energy from their yolk sac Ask: What salmon life stage is this similar to? [Alevin] Fry: Detach from plants and feed; remain in weedy, vegetated areas. Fingerling: After about one month, pike are a few inches long and develop teeth. They begin eating other fish at this stage. Adults: Can be 12” long; begin to reproduce at 1 year for males, 2 years for females. At this stage, pike eat many types of fish, including juvenile salmon, and other pike. Spawners: Pike spawn annually and do not die after spawning. Pike spawn in marshy areas with lots of vegetation. Eggs attach to aquatic plants. On average, females lay 50,000 eggs. Ask: Is this more or less than salmon? (More, salmon lay 2,000 – 6,000 eggs.) 11 10 9 8 7 6 5 4 3 2 1 1 2 3 4 5 6 7 8 9 10 Turn on screen reader support Invasive Northern Pike Instruction should highlight that pike spawn annually and do not die after reproducing. In comparison, salmon spend 1-7 years in the ocean, and then die after they return to their natal stream to spawn.

	In southcentral Alaska, where pike are invasive, juvenile salmonids are one of their favorite food resources. Ask: If pike reproduce more frequently, produce more eggs than salmon, and eat juvenile salmon, what do you think happens to salmon populations once pike invade? [They decrease]
Directions:	Present one or both of the following videos on invasive northern pike in southcentral Alaska: https://youtu.be/pDDRluz0r3c https://youtu.be/lct32AKvEy4 Link the video's references to juvenile salmonids to what students remember about the salmon life cycle. <i>Think-pair-share</i>: Which salmon life stages are most impacted by pike? What does the video say about pike's impact on salmon populations?
Wrap Up:	Hand out half-sheets of paper (or their TTCD notebooks) and coloring/writing utensils. Direct students to write or draw their answer to the following question: "If salmon could change one thing about their biology or life cycle, what one change do you think would allow them to survive better against invasive pike?" <i>Explain that they have to select a realistic change already found in some fish, not a magical change or superpower!</i> Have students <i>think-pair-share</i> and discuss the merits of each potential salmon adaptation they have chosen.
Lesson Adaptations:	For the wrap-up: Provide several sets of cards with plausible adaptations on them (spawn multiple times, lay more eggs, spawn in saltwater, develop better camouflage, spend less time in freshwater as juveniles, grow faster, grow bigger). Have students work in groups of 2-3 to choose the adaptation they think would be most beneficial to salmon. Then discuss it as a large group.
Extensions:	
Reflections:	How did it go? What did students understand most/least? What could change about instruction or lesson plan?
Resources Used:	