Eklutna River Spawning Surveys, 2021

Native Village of Eklutna

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Abstract

Historically, the Eklutna people subsisted on the plentiful salmon of the Eklutna River. In 1929, the damming of the river for a hydroelectric project to provide power to Anchorage blocked salmon passage upstream. Then, in 1955, a second hydroelectric project was completed at Eklutna Lake, which blocks any lake outflow from entering the river except during flood events. Most of the water remaining in the system comes from a small tributary- Thunderbird Creek. In spite of the removal of the lower dam in 2018, the cumulative impacts of these projects have had and continue to have significant effects on the salmon populations of the river. Salmon spawning surveys were conducted by Native Village of Eklutna in 2002-2003 (Lamoreaux 2003), but no counts have been performed since. To assess the current state of Eklutna River salmon, salmon spawning surveys were performed weekly during spawning season and will be repeated in 2022. These data will provide a baseline index by which the effects of potential restoration and mitigation measures can be compared.

Methods

Spawning surveys were performed on a weekly basis beginning on June 8th, 2021 and concluding on October 27th. Stream reaches 1-6 (Brophil and Lamoreaux 2020) and Thunderbird Creek were surveyed by foot in an upstream direction by two surveyors (when available) wearing polarized lenses to enhance fish spotting/identification. Location and numbers of salmon were recorded on a field data sheet, as well as redd locations. Salmon and redds were identified to species. Any Chinook or coho carcasses that were found were measured and the head was removed for submittal to Alaska Department of Fish and Game for otolith extraction and analyses to determine if fish had hatchery origins. Surveys were limited to Thunderbird Creek on 9/20 and 9/28 due to high flows and turbidity in the mainstem Eklutna River during experimental flow releases from the Eklutna Lake dam.

Results

Returning adult Chinook, pink, chum, and coho were observed and documented as spawning during the 2021 season. No returning sockeye were observed. Spawning was observed in reaches 1-5 and in Thunderbird Creek. No spawning of any species was observed in Reach 6, and only one individual pink salmon female was observed in that reach. Reach 6 encompasses the mainstem of the Eklutna River above the confluence with Thunderbird Creek up to the site of the removed dam. This reach is subject to low flows and contains degraded habitat due to

Figure 1. NVE field staff recording observations of returning salmon. October 19, 2021. Photo by Jessica Speed.

sedimentation from the site of dam removal. Before dam removal, this was a productive chum and coho spawning area (Lamoreaux 2003).

Chinook were observed in the system for five weeks from July 6 to August 8. Weekly counts ranged from 1-6 individuals (Table 1). Two redds were documented (Table 2), one in the mainstem of the Eklutna above the Glenn Highway bridge (Reach 5) and one in Thunderbird Creek near the falls. One Chinook carcass was recovered by another research group and submitted for otolith analyses. Analyses did not show any hatchery markings.

Table 1. Total number of adult salmon observed by survey date and species. Surveys on 9/20 and 9/28 limited to Thunderbird Creek

Fish Count by Date				
Date	**Chinook**	**Coho**	**Chum**	**Pink**
6/8/2021				
6/15/2021				
6/22/2021				
6/29/2021				
7/6/2021	2			
7/13/2021	5			
7/20/2021	4			
7/26/2021	6			10
8/2/2021	1			38
8/9/2021			4	125
8/18/2021			9	136
8/24/2021			3	105
9/1/2021		4	5	42
9/7/2021		4	1	11
9/12/2021		6		3
9/20/2021		0		
9/28/2021		4		
10/5/2021		8		
10/13/2021		3		
10/19/2021		1		
10/27/2021				

Table 2. Total number of redds observed by survey date and species. 9/20 and 9/28 Surveys limited to Thunderbird Creek

Redd Count by Date				
Date	**Chinook**	**Coho**	**Chum**	**Pink**
6/8/2021				
6/15/2021				
6/22/2021				
6/29/2021				
7/6/2021				
7/13/2021	1			
7/20/2021				
7/26/2021				
8/2/2021	1			
8/9/2021				23
8/18/2021			2	43
8/24/2021				31
9/1/2021			2	18
9/7/2021				5
9/12/2021		2		
9/20/2021				
9/28/2021		1		
10/5/2021		1		
10/13/2021		1		
10/19/2021				
10/27/2021				
Total:	**2**	**5**	**4**	**120**

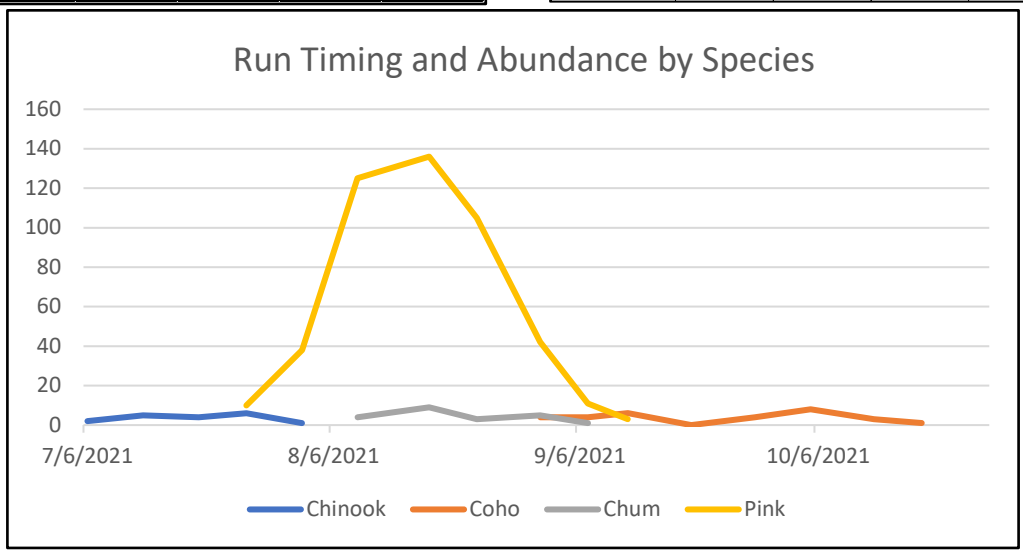

Figure 2. Observed run timing and abundance by species, 2021.

Pink salmon were observed from July 26 to September 12. Weekly counts ranged from 3-136 individuals. 120 redds were documented, and spawning activity occurred in Reaches 1-5, with the heaviest concentrations in Reach 5.

Chum salmon were observed from August 9 to September 7 with weekly counts ranging from 1-9 individuals. Four total redds were documented- two in Reach 1 and two in Reach 5.

Coho were observed in system from September 1-October 19. Counts ranged from 1-8 individuals. Five total redds were documented- one in Reach 5 and four in Thunderbird Creek. Two carcasses were recovered and submitted to ADFG for otolith analyses. One fish had hatchery markings and the other did not.

Figure 3. Female coho carcass collected on October 27th. No hatchery marks were detected

Discussion

Returns of all species of salmon except pink were down when compared to those in the previous 2002-2003 fish counts (Figure 2). Chum salmon had the largest observed decline, going from max counts of 1051 and 272 down to 9 individuals. Coho declined from max counts of 131 and 39 to 8. Chinook declined from 36 and 29 down to 6. Sockeye were observed in low numbers in 2002-3 (2 and 21, respectively), but none were observed in the Eklutna in 2021. Pink salmon, however, increased in number to a max count of 136 individuals in 2021 compared to 42 and 18 in 2002-3.

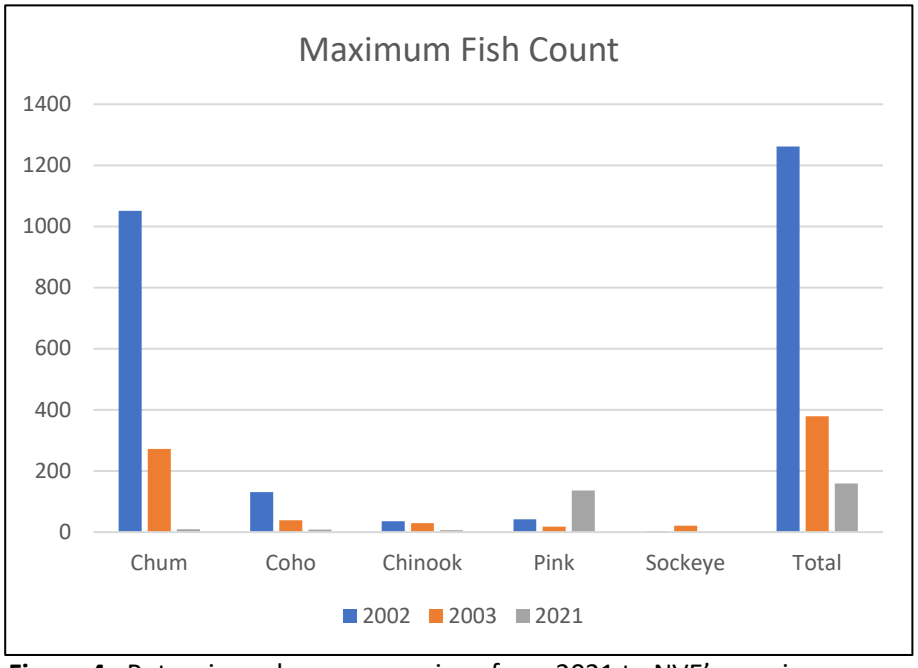

Figure 4. Returning salmon comparison from 2021 to NVE's previous study counts in 2002-3 (Lamoreaux 2003)

NVE's previous study documented heavy concentrations of spawning chum and some coho in Reach 6 of the Eklutna. This reach has undergone significant changes since the removal of the lower dam. The sediment wedge that had built up over the years behind the dam released sediment and filled in the pools which previously had been used for spawning. The degradation of this habitat may partially explain the severely depressed numbers of chum and coho seen in 2021 compared to those seen in 2002-3.

NVE will perform spawning surveys again in 2022.

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Literature Cited

Lamoreaux, M. 2003. *Native Village of Eklutna 2002 Eklutna River Fish Study*. Native Village of Eklutna. Accessed 3/10/2022. http://eklutna-nsn.gov/download/NVE-Fish-Study-2002-2003.pdf

Brophil, C.A. and M. Lamoreaux. 2020. Eklutna River Salmon Habitat Assessment and Collaboration to Recommend Restoration Flows. Native Village of Eklutna.