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Fisheries Resource Monitoring Program

Abundance and Run Timing of Adult Salmon in Tanada Creek in the
Wrangell-St. Elias National Park and Preserve, 2007

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ABSTRACT

Tanada Lake salmon are highly susceptible to Federal and State subsistence users as well as commercial harvest. The Batzulnetas Area subsistence fisheries specifically target Tanada Lake salmon stocks. Monitoring Tanada Lake salmon stocks aids in assessing sockeye salmon escapement into the uppermost tributaries of the Copper River and in evaluating the harvest opportunity for subsistence fishers in the Batzulnetas Area fishery and the uppermost portion of the Glennallen Subdistrict. The dynamic nature of the flows in Tanada Creek has prevented a rigid picket weir from functioning successfully. The feasibility of a floating resistance board weir utilizing underwater video counting as a monitoring tool were tested in Tanada Creek.

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INTRODUCTION

The upper Copper River drainage provides spawning habitat for sockeye *Oncorhynchus nerka* and Chinook *Oncorhynchus tshawytscha* salmon. Large numbers of adult salmon are harvested in commercial drift gillnet operations near the mouth of the Copper River from mid-May to September. Salmon escapement into the upper Copper River system contributes to Federal and State subsistence fishing opportunities through September 30. The monitoring and evaluation of these runs is essential to ensure that Wrangell - St. Elias National Park and Preserve (WRST) maintains natural and healthy populations of fish as required by the Alaska National Interest Lands Conservation Act (ANILCA).

The Copper River system supports over 124 known stocks of sockeye salmon, of which at least 12 occur above the confluence of the Copper and Slana Rivers (Roberson 1987). Two of these stocks migrate through Tanada Creek and spawn along the shores of Tanada Lake and in the lake outlet area (Figure 1). Historically, Chinook salmon are present in small numbers in Tanada Creek (Veatch and Scotton 2001). Tanada Lake sockeye salmon typically comprise the largest combined stock of spawning sockeye within the boundaries of the Wrangell-St.Elias National Park/Preserve, and is one of the largest stocks which spawn upstream of the Gulkana River. Tanada Creek is an ideal candidate for a weir site since it is one of the only clear water salmon streams that is near a road and accessible within WRST. Accurate, historic escapement data are needed to assess long term management strategies for Copper River fisheries and ensure sustainability of these important sockeye salmon stocks.

During 1997, 1998, and from 2001 through 2007, a fish weir has been operated by WRST in Tanada Creek to document salmon escapements into this Upper Copper River tributary. Prior to these years, The Alaska Department of Fish and Game (ADFG) operated a weir near the Tanada Lake outlet in 1979.

Tanada Lake sockeye are one of the uppermost runs of sockeye salmon in the Copper River drainage and support subsistence salmon fisheries both in the Copper River and in Tanada Creek. Historically, the native villages of Mentasta and Chistochina harvested salmon in the Batzulnetas Area fishery. Batzulnetas, the Ahtna name for the traditional fishing site on Tanada Creek, has been used by the Ahtna people for over 1,000 years (Kari 1986). From 1985-200, Katie John, Doris Charles and others attempted to reestablish this traditional subsistence fishery through litigation in Federal courts. The final "Katie John Decision", in which the Ninth U.S. Circuit Court of Appeals affirmed the Ninth U.S. Circuit Court's decision, resulted in expansion of Federal management of fisheries in waters under Federal jurisdiction throughout Alaska.

OBJECTIVES

Specific objectives for this seasons' study were to:

1. Install and operate a weir from approximately June to mid-August.
2. Compare and assess run timing with historic estimates.
3. Estimate age, sex, and length composition of the escapement.
4. Test video technology as an alternative method of assessing abundance.
5. Measure select water quality parameters and zooplankton biomass, and estimate correlation with estimates of escapement.
6. Conduct outreach about this project through instruction of local students and residents.

METHODS

Study Area

Tanada Creek is a third order perennial stream and a tributary to the upper Copper River in southeast interior Alaska (Figure 1). Originating at Tanada Lake (62°27'N, 143°23'W), Tanada Creek runs 30 km northwest to its confluence with the Copper River (62°37'N, 143°48'W). The creek flows through the Copper River Plateau and encompasses a watershed area of approximately 550 km². The terrain ranges from nearly level to gently rolling throughout the creek basin, and the creek gradient is less than 2%. Vegetation is dominated by mosses, sedges, dwarf birch, and willows. Black and white spruces are the primary evergreens, with stands of cottonwoods interspersed. Soils are poorly drained and underlain by shallow permafrost (USDA 1979). Annual precipitation in the area averages 39 cm, and ambient temperature ranges from a high of 32° C to a low of - 46° C with an average annual temperature of - 2.5° C (NOAA 1995). Tanada Lake usually freezes in September or October, and ice breakup normally occurs in May

The Tanada Creek weir is located approximately 750 m upstream from the Copper River and 300 m downstream from the Batzulnetas village site. Stream width at the weir is approximately 12 m. The vertical banks are approximately 0.65 m high, and there is no bank undercutting. Maximum water depth at midstream during bank-full conditions is estimated to be 1.5 m, and water velocity is moderate at normal water levels. The creek is prone to flooding during heavy rain. Channel substrate at both sites is predominately cobble, with interstitial sand, silt, and gravel. The stream banks are stabilized by spruce, willow, alder, grasses, and an understory of moss and horsetail ferns. Spruce, cottonwoods, and alder contribute to stream shading.

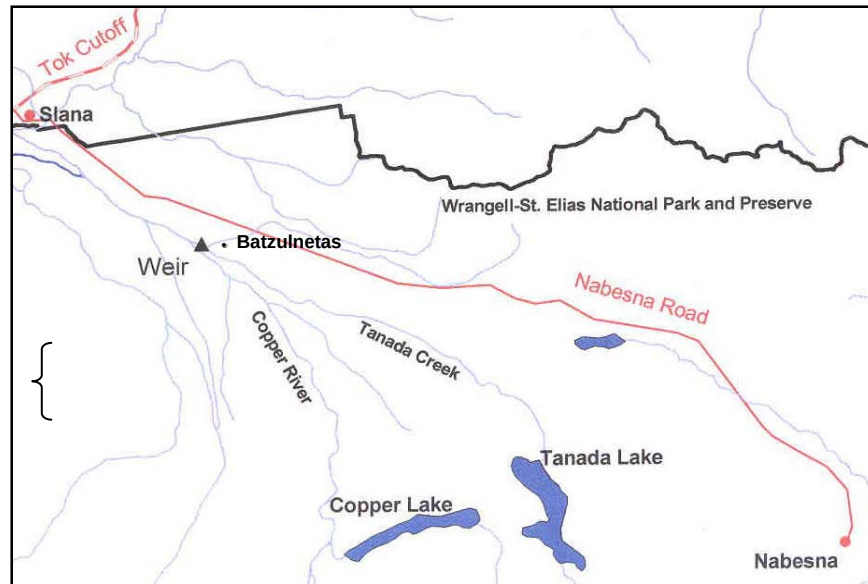


Figure 1. Tanada Creek and vicinity.

Weir Installation and Operation

In 2007, a floating resistance board weir was installed as described by Tobin (1994) (Figure 2). Installation began on May 29 (Figure 3) and was completed June 13 (Figure 4). The weir was installed at the same location as in 2006, which is approximately 50 meters downstream of its location of prior years. This site featured a wider stream cross section, a relatively shallow, less pronounced channel, and no bank undercutting. This location was selected to reduce the risk of major flooding at the weir site. The weir, with picket spacing of 3.75 cm, was placed across the 12 m stream width. The weir was designed with resistance boards that could be adjusted to raise the downstream end of the weir pickets approximately 75 cm above the water surface. Rigid weir pickets were installed from each riverbank connecting to the vertical bulkhead pickets of the floating weir structure. A 1.5 m x 2 m fish trap was installed in the weir near the north bank. The trap was constructed of aluminum channel, steel pipes, and PVC with gates that could be raised and lowered at both ends to allow for holding, sampling, and releasing fish. Technicians using dry suits, face masks, and snorkels regularly checked the integrity of the weir and repaired any gaps that could permit fish passage.

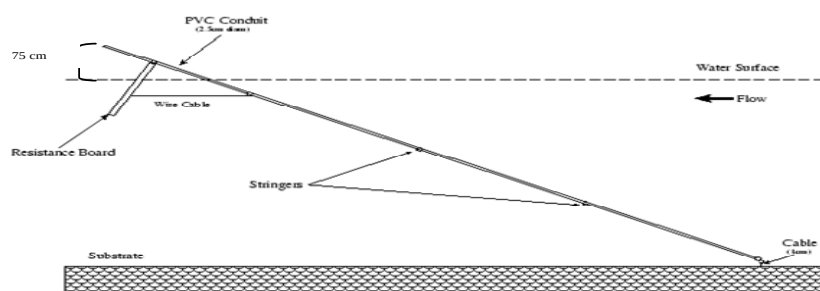


Figure 2. Side-View diagram of weir structure.



Figure 3. Constructing Tanada Creek weir, 2007.



Figure 4. Completed Tanada Creek weir structure, 2007.

A permanent cross section station was established on June 9, 1998 at a location approximately 100 m upstream of the present weir site. Four brass cap reference markers were set along a transect. A staff-gauge was placed in the creek near the north bank along the cross section. A staff gauge and water temperature reading were taken at the beginning of each daily weir check.

One *HOBOTM* data logger was placed in a submersible case at the base of the staff gauge to collect water temperature data throughout the summer. The data logger recorded temperatures every hour and 30 minutes.

Escapement Estimation

We incorporated a major change in the video camera system by replacing the overhead video camera recording system, which was in effect a system totally separate from the weir, with a new underwater camera installed directly on a passage chute connected to the weir (Figures 5, 6, and 7). This allowed unimpeded fish passage throughout the day and night, except when the crew closed the weir gate to review recorded video footage or obtain biological samples. To obtain useable video images during flooded, murky water conditions, the camera was secured inside a sealed aluminum housing that was filled with clear water. The fish passage chute forced fish passing through the weir to swim within a few inches of the glass surface of the camera housing. Thus even during periods of high turbidity, only the few inches of turbid water was between the glass surface of the camera housing and the body of the fish.



Figure 5. Video camera housing attached to fish passage chute.



Figure 6. Preparing camera housing for placement in river.



Figure 7. Underwater video and fish passage chute attached to weir.

Two 12 volt LED cluster lights were installed in the fish passage chute to illuminate the view area. A photocell switch automatically turned the lights on and off in response to changes in the level of ambient light.

A weatherproof case containing both a time-lapse S-VHS recorder and a separate digital video recorder (DVR) were housed on the north bank of the creek (Figure 8). A bank of four 12-volt deep cycle batteries (400 Amp-hours total capacity) provided power to the system. The use of duplicate recording provided a back up in case one of the units malfunctioned or failed to record. Charge was maintained in the battery bank primarily through use of a gas powered 2000 W generator and 40 Amp, 12-volt charger. Supplemental charge was also obtained from a photovoltaic solar panel array of 220 Watts and a charge controller.

Counts reported for 2007 were predominately obtained from the DVR footage since it was easier for staff to review output from the DVR than from the S-VHS recorder on site during daily weir checks. Having duplicate recording units proved useful since there were occasional times when one of the units would fail. However, both units failed to record data during one 8 hour period on July 5 and one 6 hour period on July 14. We did not attempt to generate fish passage estimates for these missing 14 hours.



Figure 8. Video recorders and field monitor.

Daily weir checks were performed throughout the season. Upon arrival at the site, staff would close the weir gate to the fish passage chute, stop video recording, and then review digital video footage from the previous day's video start time to the present day video stop time. All observed salmon passage was recorded by hour (Figure 9). The time-lapse recorder was programmed to record in standard play (SP) mode, allowing for 48 hours of viewing on each T-160 tape. Tapes were changed every 48 hours.



Figure 9. Image of sockeye salmon passing camera.

Biological Data

As a means of estimating the age, sex, and length composition of sockeye salmon in the spawning escapement, we collected scales, identified sex, and measured length from samples of live fish taken from the live box in the weir; and also collected otoliths, identified sex, and measured length from samples of carcasses taken from spawning areas.

To obtain biological data from live sockeye salmon, the fish trap was operated for 3-5 hours during each daily weir check, and all sockeye salmon captured were sampled. A sampling cradle was used to facilitate handling. One scale was taken from each sockeye salmon in accordance with ADF&G protocols that specified a preferred area for scale collection, which is located on the left side of the fish, two rows above the lateral line on a diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin. Sex was determined from observation of external characteristics. Length was measured to the nearest 5 millimeter from mid-eye to fork of tail length (MEF). Sampled fish were marked with a round hole punched through the left opercle to avoid the possibility of sampling them again.

To obtain additional biological data from carcasses, a sampling trip was made to the lake outlet area and into Tanada Lake on September 12. Carcasses and heads were collected using a dip net and seine. Otoliths were removed by dissection, while sex and length were obtained when possible.

Scale and otolith samples were analyzed by ADFG Commercial Fisheries Division staff in Cordova to ensure consistency in aging. Ages of sockeye salmon whose scale margins had been reabsorbed were estimated from a length-at-age relationship developed using mixed stock samples ADFG collected on the lower Copper River.

Capacity Building

Owners of the Batzulnetas village site have generously cooperated with WRST by allowing use of their land to conduct this project. We work directly with them regarding any concerns they may have pertaining to the project or impacts from land use. During the Batzulnetas culture camp, which occurs each July, WRST provides a forum for community members to observe the weir project in operation and to ask questions about abundance, timing and management of the Tanada Creek run. Participation in the Batzulnetas subsistence fishery varies each year. We also hire local residents to work on the weir project, and these employees provide a direct connection between this project and surrounding communities.

RESULTS

Weir Operation

The weir was operated 102 days, from June 13 to September 23 (Table 1). No holes in the weir or scours at the base of the weir were found, and no flood events occurred. Although the floating resistance board weir was successfully operated during 2004, 2006, and 2007, it remains prone to periods of inoperability during years with extended periods of heavy rainfall. In 2005, four high water events compromised the weir; the flood level rose to above the stream banks and the near-shore rigid pickets were removed due to excessive debris load (Figure 13).

Table 1. Dates of weir operation, Tanada Creek, 2000-2007.				
Year	Start date	End date	Flood days	Days operational
2000	June 8	July 13		2
2001	June 5	August 23		60
2002	June 27	August 15		49
2003	May 31	September 19		112
2004	May 29	September 7		99
2005	May 26	September 22	18	101
2006	June 6	September 21	0	108
2007	June 13	September 23	0	102



Figure 10. Tanada Creek weir at flood stage in 2005.

Staff gauge readings in 2007 ranged from 0.2 ft to 2.2 ft and were below the 2002-2006 average for much of the season (Figure 11). Staff gauge readings in 2007 during the period the weir was in operation were generally below average levels for the preceding five years except for a few days in late June and during late September (Figure 12). In contrast, the water level in 2005 ranged from 1.3 ft to 4.5 ft and was the highest since staff gauge readings were started in 2002 (McCormick and Sarafin 2006).

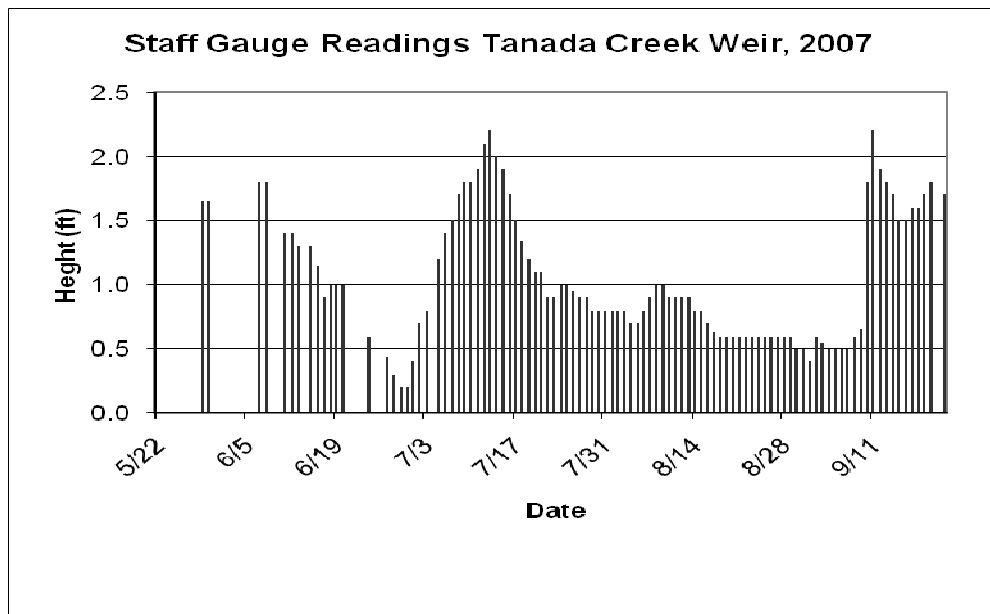


Figure 11. Staff gauge readings at Tanada Creek weir site, 2007.

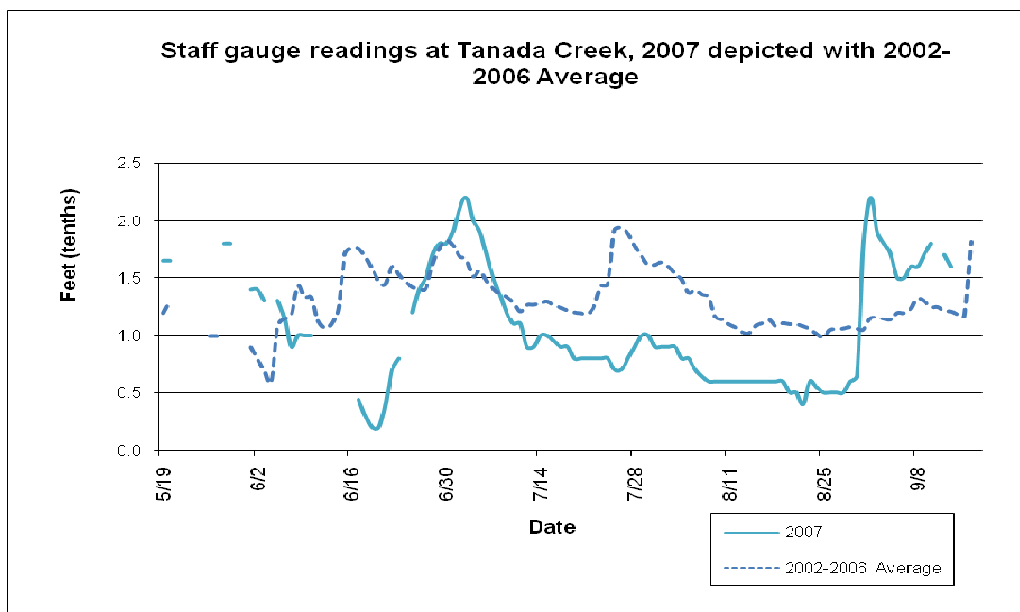


Figure 12. Staff gauge readings at Tanada Creek weir site, 2007 and 2002-2006 average.

Water temperatures in 2007 ranged from 40°F to 63° and were generally similar to temperatures during 2002, 2004, and 2006 from late June through mid-August (Figure 13). From mid-August through early September, 2007 water temperatures were generally warmer than those recorded during 2004 and 2006 and colder than those recorded in 2002.

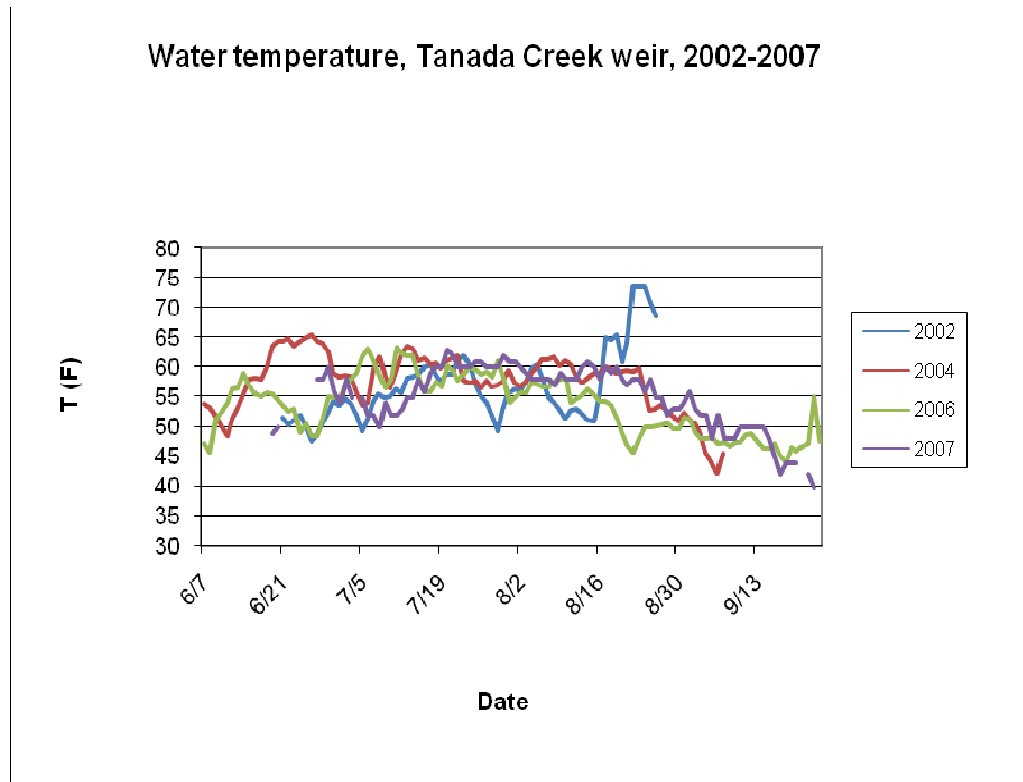


Figure 13. Water temperature at Tanada Creek weir site, 2002-2007.

Escapement Estimation

A total of 11,103 sockeye and 7 Chinook salmon was observed migrating past the weir in 2007 (Figure 11 and Appendix A). The greatest daily escapement was recorded on July 29 when 646 sockeye salmon were counted through the weir. The 2007 weir passage estimate of sockeye salmon was similar to the historical average of 11,736 (Figure 15 and Table 2). The 2007 weir passage estimate of Chinook salmon was almost twice the historical average (4), but continued the past trend of very low abundance.

The Tanada Lake sockeye salmon stock comprises an extremely small component of the total Copper River run (Table 3). In 2007, the Tanada Lake escapement comprised about 1.2% of the estimated total escapement of 926,438 sockeye salmon into the Copper River. This was just slightly less than the historical average of 1.6%.

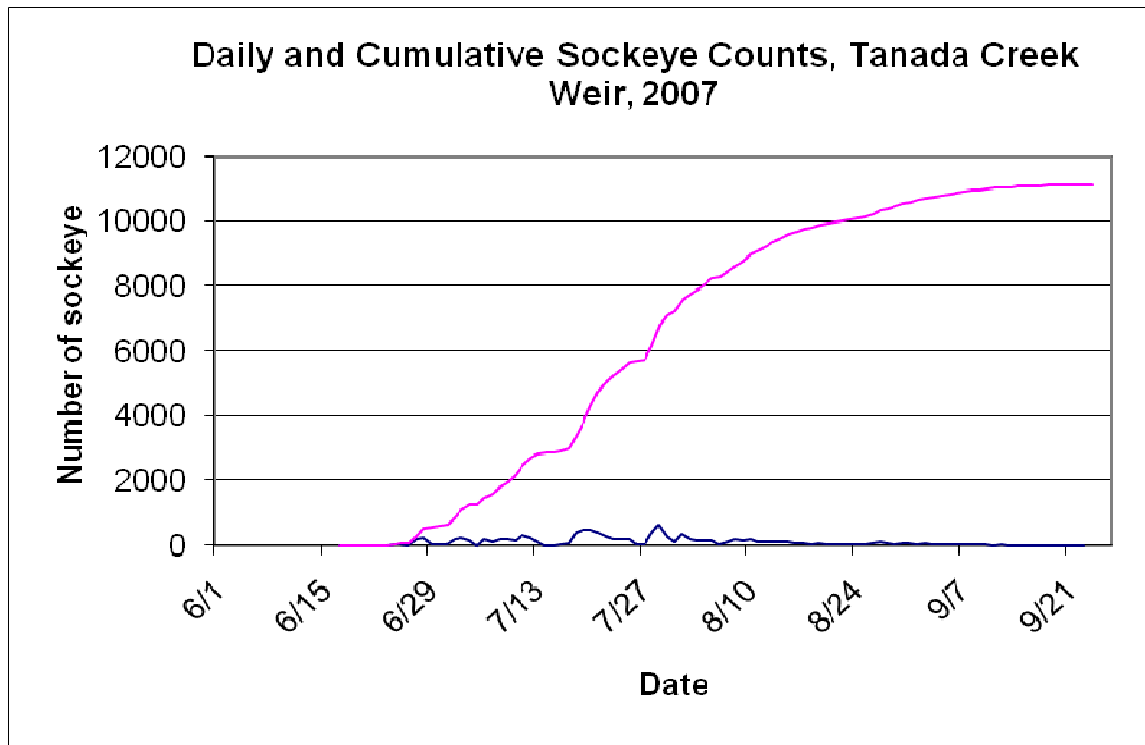


Figure 14. Daily and cumulative counts of sockeye salmon passing the weir, 2007. (The lower line represents daily counts, while the upper line represents cumulative counts.)

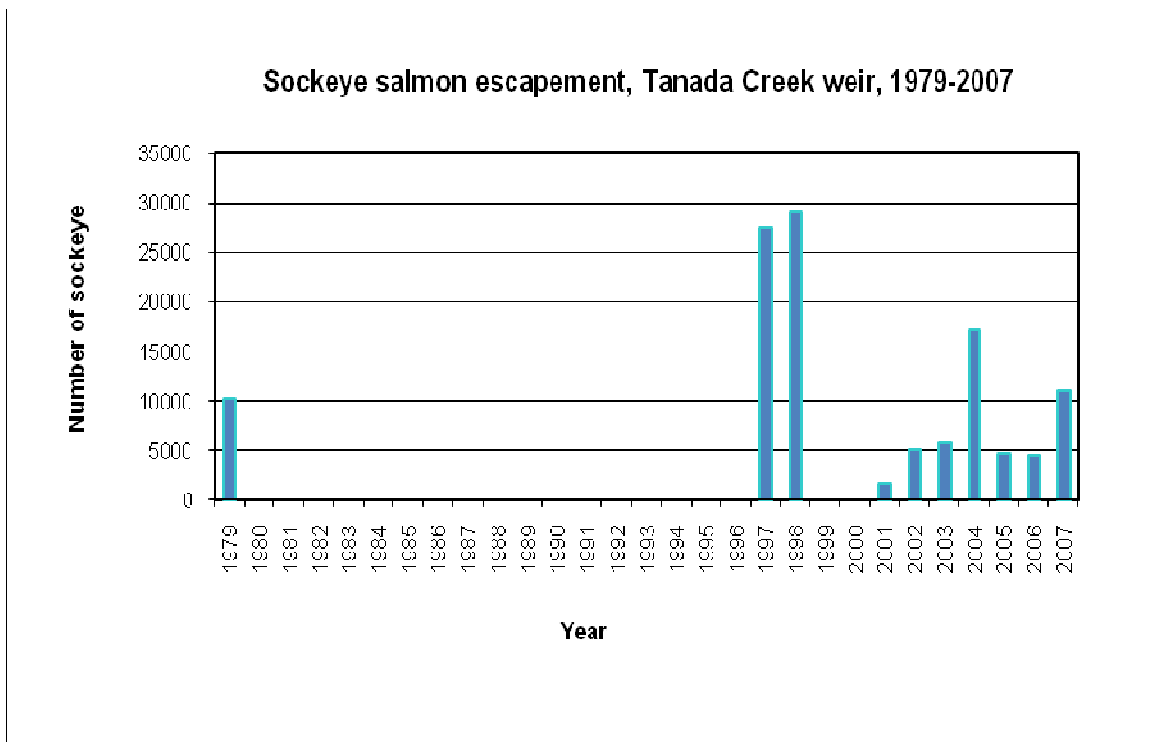


Figure 15. Estimated escapement by year, 1979-2007.

Table 2. Tanada Creek weir salmon passage estimates obtained since 1979, total estimated inriver sockeye salmon run estimates from Miles Lake sonar project for the corresponding years. (The percentage of the total Copper River inriver run represented by Tanada Creek is shown in parentheses.)

Year	Number of sockeye		Number of Chinook in Tanada Creek
	Tanada Creek	Miles Lake	
1979	10,244 (4.3)	237,173	5
1997	20,729 ¹ (1.8)	1,148,079	5
1998	28,992 ² (3.3)	866,957	2
1999	—	848,921	—
2000	—	587,592	—
2001	1,649 (0.2)	833,569	16
2002	6,186 ³ (0.8)	816,825	5
2003	5,856 (0.6)	695,233	2
2004	17,120 (2.6)	669,646	0
2005	4,659 ⁴ (0.5)	854,268	1
2006	4,514 (0.5)	959,731	4
2007	11,103 (1.2)	926,438	7
1979-2006 Average	11,105 (1.6)	816,831	4

¹ Contains expanded estimates from periods without monitoring; however, season was also reduced due to flooding.

² Value contains an estimate of 1,030 fish passed through a breach in weir.

³ Estimate based upon mark-recapture sampling; the actual weir count was 2,489.

⁴ Weir compromised by flooding, estimate from video count; the actual weir count was 739.

Run Timing

In 2007, the first sockeye salmon was observed at the weir June 20. The median point of the run occurred July 25 when the cumulative total reached 5,552 sockeye salmon. The last sockeye was observed on video on September 20, and the weir was removed on September 23. Historically, the first sockeye salmon have been observed at the weir between June 11 and July 13, while the median date of the run has ranged from July 2 to August 23 (Table 3). In 2007, the first sockeye salmon was observed on June 20, while the median date of the run was July 25. The migratory run timing curve for 2007 was very close to the historic average curve and similar to the curve for 1998 (Figure 16).

Table 3. Annual arrival date of first sockeye salmon and median point of migration past the Tanada Creek weir, 1998, 2001-2007.

	First Sockeye	Median Date	Median Number
1998	13-Jul	19-Jul	14,496
2001	14-Jun	14-Jul	825
2002	28-Jun	12-Jul	3,094 ¹
2003	11-Jun	5-Aug	2,929
2004	11-Jun	2-Aug	8,560
2005	13-Jun	23-Aug	2,539 ²
2006	17-Jun	2-Jul	2,257
2007	20-Jun	25-Jul	5,552

¹extrapolated based upon total run size estimate.

²based on overhead video count.

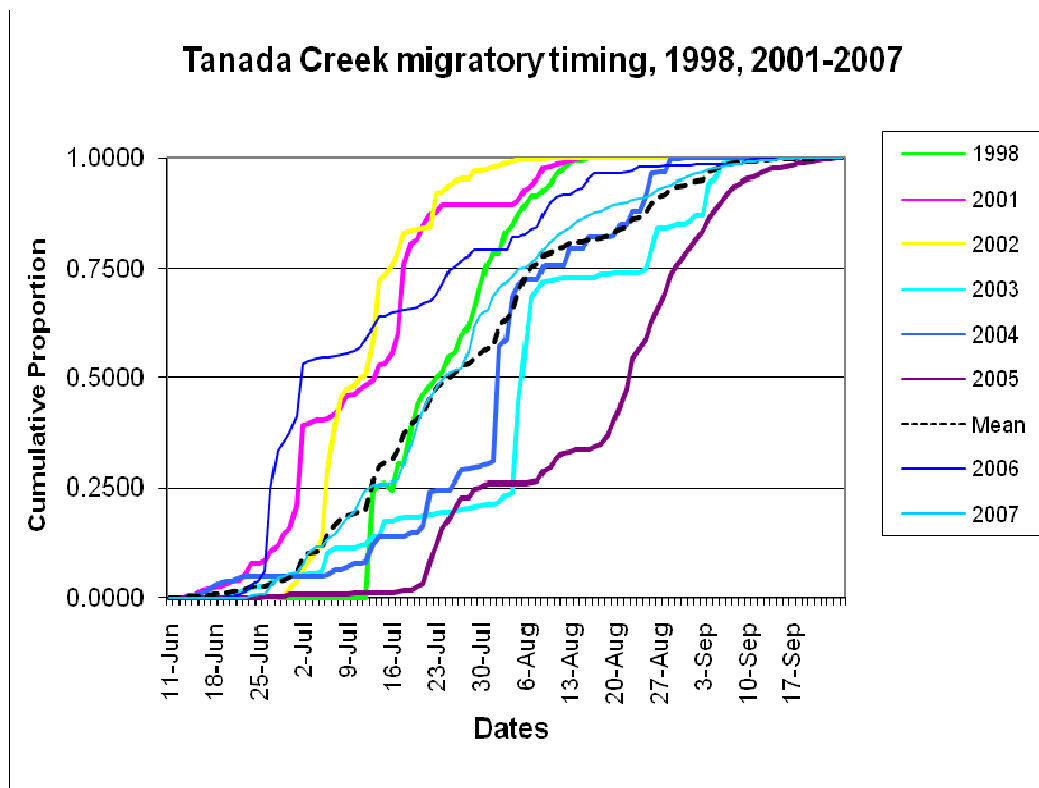


Figure 16. Historical and average migratory run timing for sockeye salmon passing the Tanada Creek weir site.

Biological Data

A total of 604 sockeye salmon were sampled for age, sex, and length information during the period of July 1 through September 12. Scales were collected from 394 individuals and otoliths from 210. From these 604 samples, 542 individuals could be aged, which represented about 5% of the total escapement. Ages were obtained from all 210 otoliths, but 62 scales were not useable.

Age-1.3 sockeye salmon from the 2002 brood year were estimated to comprise 95.3% of the escapement (Table 4). Only 0.6% of the escapement was estimated to be age-1.4 and -2.3 sockeye salmon from the 2001 brood year, while the remaining 4.1% of the escapement was estimated to be age-0.3 and -1.2 sockeye salmon from the 2003 brood year.

Table 4. Age-class, brood year, and sex of Tanada Lake sockeye salmon sampled during July 1-September 12, 2007.							
Sex		Brood Year and Age-Class ¹					Weir Passage
		2003		2002	2001		
		0.3	1.2	1.3	1.4	2.3	
Female	Percentage of sample	0.5	0.9	39.9	0.0	0.2	41.5
	Number in escapement	61	102	4,425	0	20	4,608
Male	Percentage of sample	1.9	0.7	55.5	0.2	0.2	58.5
	Number in escapement	205	82	6,166	20	20	6,493
Total	Percentage of sample	2.4	1.7	95.3	0.2	0.4	100.0
	Number in escapement	266	184	10,591	20	40	11,101
	Standard Error	73	61	100	20	29	

¹Ages interpreted from otoliths and scales. Saltwater ages from resorbed scales were determined from length frequency data.

Capacity Building

In 2007, this weir project provided employment for five local residents who worked as technicians staffing the weir. The Batzulnetas culture camp took place during the week of July 16-20 (Figure 17). The weir was being operated during this event, and several tours of the weir site given by NPS crew and staff members during the week of culture camp. Reports concerning the weir project were given at local Subsistence Resource Commission meetings, South Central Resource Advisory Council meetings, government-to-government meetings with Mentasta and Chistochina, and to the Ahtna Subsistence Committee.



Figure 17. Batzulnetas culture camp.

DISCUSSION

Escapement Estimation

Escapement monitoring typically relies on video, sonar, or direct visual observation. Video technology provides a means of monitoring without having staff on site throughout the field season. Prior to 2007, Tanada Creek weir operations were based on direct visual observations made one or more times each day. The gate in the weir was only open to allow fish passage when counts were being done. Despite efforts to make counts and pass fish at various times of the day, salmon would not always pass through the weir while someone was on site and opened the gate. Inevitably, salmon would be observed backed up below the weir, congregated in pools, and delayed in their migratory attempts. This increases their vulnerability to predation and can eventually lead to self-inflicted bodily damage as fish repeatedly attempt to push through or past structures of the weir. Also, when salmon are concentrated behind the weir, the likelihood of attracting bears to the weir is increased. One option to regulating fish passage by closing and opening a gate within the weir is to keep the gate open at all times. If salmon were counted by direct visual observations, keeping the weir open at all times would make it necessary to extrapolate data to cover periods when visual observations were not being made. Since salmon migration rates are not uniform either within or among days, visual observations would need to be made several times each day to reduce the magnitude of extrapolation errors. By using an underwater video camera in conjunction with a passage chute to ensure that all fish passing through the weir travel close to the camera lens, the gates remain open while staff is not present, and fish can pass in a more natural pattern with fewer detrimental effects.

Run Timing

Determining a median run date that could be used to forecast the total run size in-season would be useful to managers. However, run timing of the Tanada Creek sockeye salmon stock has been highly variable (Table 4 and Figure 16), which indicates that inseason forecasting could not be done with a useful amount of precision. Many factors could affect run timing each year, including fisheries, physical barriers, water discharge, and water temperature.

Biological Data

With the new methodology of the continuously operating underwater video camera in place this year, staffing time at the weir site was greatly reduced. However, having the weir gate continually open except for the 3-5 hours each day when staff were at the site, reduced the number of salmon available for sampling, since their migration was no longer impeded. Therefore, we increased our sample by collecting otoliths from carcasses found near spawning areas. Overall, we obtained samples from approximately 5% of the run. While age-1.3 sockeye salmon comprised most of the sample, as has been found in past years, the accuracy and precision of percent contribution estimates were lower. In future years, we will conduct multiple sampling events on the spawning grounds to obtain a larger sample size. Ages obtained from otoliths may also be more accurate than those from scales, since many scales show extensive resorbed outer margins. Sockeye salmon with reabsorbed scales were aged through use of a length-at-age relationship developed by ADFG. However, data from the relationship are obtained from mixed stock samples collected in the lower Copper River. If large difference in length-at-age occurred among stocks, this technique will introduce some unknown error into results for the Tanada Creek stock.

Capacity Building

Sockeye escapement in Tanada Creek has fluctuated substantially during the years that the weir has been in operation from a high of 28,992 in 1998 to a low of 1,649 in 2001 (Table 2). During those years the sockeye harvest in the Batzulnetas fishery has varied from a high of 582 in 1998 to a low of 0 in some years (Table 5). In 2005, the Batzulnetas fish wheel was damaged by the flood waters and no fish were caught. In 2007, one Batzulnetas permit was issued and only one sockeye salmon was harvested.

In 2007, five local residents of the Slana area were employed by WRST to staff the weir. Through this employment, they gained experience in biological monitoring, sampling, reporting, and entering data. Through their individual local ties, they each contributed to disseminating information from this, and other projects within the Park. They had a positive impact on improving relations between the residents of local communities and WRST.

Table 5. Participation and harvest in the Batzulnetas fishery, 1987-2007.					
Year	Permits Issued	Sockeye Harvest	Year	Permits Issued	Sockeye Harvest
1987	8	22	1998	3	582
1988	0	0	1999	1	55
1989	0	0	2000	0	0
1990	0	0	2001	1	62
1991	0	0	2002	1	208
1992	0	0	2003	1	164
1993	1	160	2004	1	182
1994	4	997	2005	1	0
1995	4	16	2006	0	0
1996	0	0	2007	1	1
1997	1	428			

CONCLUSIONS

Weir Operation

The present weir site has worked well in 2006 and 2007, although water levels were not high and it hasn't been put to the test of flood waters. The floating resistance board weir and underwater video camera recording system was successfully operated at this site.

Escapement Estimation

Underwater video provides an excellent means of enumerating salmon passage at the weir. Salmon are counted daily during on-site video review. Interference to natural migratory timing is minimized. Run timing appears to be highly variable in Tanada Creek. The average median run date does not appear to be a useful tool for projecting total run size using the existing data.

Biological Data

Otoliths can provide saltwater adult life-stage information that cannot be obtained from the resorbed scales typically collected at Tanada Creek. It appears feasible to collect otoliths as a means of gaining stock-specific age-class data for the Tanada Lake escapement. The

predominant age-class (1.3) of the sockeye salmon escapement to Tanada Lake was similar to past years of this project.

Capacity Building

The Tanada Creek weir project supports positive relations between the WRST, fisheries managers, and the residents of local communities.

RECOMMENDATIONS

Weir Operations

1. Continue to operate the weir at the present site, which has been used during 2006 and 2007.
2. Survey Tanada Creek for potential weir sites that may be more resistant to impacts from floods resulting from heavy seasonal rains.

Escapement Estimation

1. Continue to operate the underwater video camera system to estimate escapement.
2. To decrease reliance on a gas powered generator, improve the performance of the photovoltaic power supply by increasing the array wattage, relocating the array, or installing a more efficient charge controller (MPPT, utilizing maximum power point tracking technology).
3. Continue monitoring to work towards a definition of natural and healthy sockeye salmon escapement for Tanada Lake stocks.

Biological Data

1. Increase efforts to collect otoliths to provide AWL data and discontinue scale sampling efforts.

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Appendix A. Tanada Creek daily salmon counts, 2007.

Tanada Creek Weir Salmon Counts, 2007				
Date	Daily sockeye	Cumulative sockeye	Daily Chinook	Cumulative Chinook
6/13/07	0	0	0	0
6/14/07	0	0	0	0
6/15/07	0	0	0	0
6/16/07	0	0	0	0
6/17/07	0	0	0	0
6/18/07	0	0	0	0
6/19/07	0	0	0	0
6/20/07	7	7	0	0
6/21/07	2	9	0	0
6/22/07	3	12	0	0
6/23/07	1	13	0	0
6/24/07	47	60	0	0
6/25/07	29	89	0	0
6/26/07	0	89	0	0
6/27/07	201	290	0	0
6/28/07	239	529	0	0
6/29/07	26	555	0	0
6/30/07	52	607	0	0
7/1/07	47	654	0	0
7/2/07	189	843	0	0
7/3/07	256	1,099	0	0
7/4/07	180	1,279	0	0
7/5/07	0	1,279	0	0
7/6/07	182	1,461	0	0
7/7/07	130	1,591	0	0
7/8/07	196	1,787	0	0
7/9/07	198	1,985	0	0
7/10/07	166	2,151	0	0
7/11/07	321	2,472	0	0
7/12/07	237	2,709	0	0
7/13/07	128	2,837	0	0
7/14/07	18	2,855	0	0
7/15/07	0	2,855	0	0
7/16/07	46	2,901	0	0
7/17/07	80	2,981	0	0
7/18/07	394	3,375	0	0
7/19/07	478	3,853	0	0
7/20/07	471	4,324	2	2
7/21/07	419	4,743	3	5
7/22/07	298	5,041	1	6
7/23/07	210	5,251	0	6
7/24/07	207	5,458	0	6
7/25/07	193	5,651	0	6
7/26/07	44	5,695	0	6
7/27/07	45	5,740	0	6
7/28/07	413	6,153	0	6
7/29/07	646	6,799	0	6
7/30/07	298	7,097	0	6

7/31/07	121	7,218	0	6
8/1/07	354	7,572	0	6
8/2/07	191	7,763	1	7
8/3/07	154	7,917	0	7
8/4/07	156	8,073	0	7
8/5/07	174	8,247	0	7
8/6/07	35	8,282	0	7
8/7/07	140	8,422	0	7
8/8/07	189	8,611	0	7
8/9/07	175	8,786	0	7
8/10/07	183	8,969	0	7
8/11/07	141	9,110	0	7
8/12/07	113	9,223	0	7
8/13/07	120	9,343	0	7
8/14/07	117	9,460	0	7
8/15/07	109	9,569	0	7
8/16/07	96	9,665	0	7
8/17/07	66	9,731	0	7
8/18/07	50	9,781	0	7
8/19/07	83	9,864	0	7
8/20/07	56	9,920	0	7
8/21/07	47	9,967	0	7
8/22/07	42	10,009	0	7
8/23/07	43	10,052	0	7
8/24/07	29	10,081	0	7
8/25/07	27	10,108	0	7
8/26/07	90	10,198	0	7
8/27/07	108	10,306	0	7
8/28/07	68	10,374	0	7
8/29/07	60	10,434	0	7
8/30/07	90	10,524	0	7
8/31/07	66	10,590	0	7
9/1/07	43	10,633	0	7
9/2/07	63	10,696	0	7
9/3/07	43	10,739	0	7
9/4/07	56	10,795	0	7
9/5/07	38	10,833	0	7
9/6/07	32	10,865	0	7
9/7/07	36	10,901	0	7
9/8/07	29	10,930	0	7
9/9/07	25	10,955	0	7
9/10/07	37	10,992	0	7
9/11/07	11	11,003	0	7
9/12/07	24	11,027	0	7
9/13/07	11	11,038	0	7
9/14/07	11	11,049	0	7
9/15/07	6	11,055	0	7
9/16/07	9	11,064	0	7
9/17/07	17	11,081	0	7
9/18/07	14	11,095	0	7
9/19/07	6	11,101	0	7
9/20/07	2	11,103	0	7
9/21/07	0	11,103	0	7

9/22/07	0	11,103	0	7
9/23/07	0	11,103	0	7

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