

Little Gunnuk Creek Site Visit

Date: 9/09/08 – 9/11/08

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Background

Little Gunnuk Creek is located in the Little Gunnuk watershed, approximately 0.25 miles southeast of the Gunnuk Creek Hatchery in Kake, Alaska (Figure 1). It is a Class 1 salmon stream near the estuary, and likely becomes a Class 2 resident fish stream (cutthroat trout, Dolly Varden char) past the cascades upstream of the old dam, approximately 0.25 miles from the road crossing in Kake. This stream was harvested to the banks in 1980 near the headwaters, upstream and immediately downstream of the crossing on Road 6308 in the upper portion of the watershed. This report is a summary of a field visit conducted on 9/09/08 to 9/11/08. The goal was to answer basic questions about the channel and riparian condition, and to assess the potential to restore degraded habitat.



Figure 1. Little Gunnuk Watershed near Kake, Alaska

Objectives

1. Qualitatively assess the channel and riparian condition of Little Gunnuk Creek along its entire length from the estuary to the portion harvested to the streambanks near the headwaters.
2. Conduct a Tier 2 stream survey in the upper portion of the watershed and compare the results with Tongass National Forest standards used for Fish Habitat Objectives for the same channel type.
3. Gather information about the watershed and stream from people familiar with its history, and clarify objectives for future use and/or potential restoration.
4. Identify data needs.

Observations

Weather conditions for the two days spent on the stream were partly cloudy, with intermittent rain, and mild temperatures in the mid-forties. The stream was flowing at a moderate level following several days of light rain. The lower portion of the stream was reconnoitered by USFS and Gunnuk Hatchery personnel on 9/10/08 from the mouth to approximately 1 mile below the road crossing near the headwaters. The following day USFS personnel reconnoitered the stream from the upper stream crossing on Road 6308 downstream to the beginning of the large beaver complex. Fish passage and information needs were identified, and riparian condition was assessed visually.

Lower Watershed (Downstream of Road 6308)

An old check dam approximately 0.25 miles upstream of the mouth was assessed for upstream passage. The dam is approximately 3m high, 5m across, and has withstood many years of flow without failure (according to Mike Jackson this dam supplied water to the old cannery near the turn of the century). Water flows under and through the structure, with a large space below the lowest log providing sufficient passage upstream (Photo 1).



Photo 1. Upstream view of old check dam on Little Gunnuk Creek.

Approximately 100m upstream from the dam, a series of cascades was encountered. The first was a triple drop with a large pool at the bottom and was likely passable for adult coho (Photo 2).



Photo 2. First cascade upstream of dam.

The second cascade was encountered shortly after the first. This barrier was approximately 4m high, and is likely a barrier to fish migrating upstream (Photo 3).



Photo 3. Second cascade encountered after dam. Likely a barrier to upstream migrating fish. Note Zack on the left for scale.

The third cascade was approximately 3m high and was encountered just upstream of the second. It appeared passable on the downstream right portion of the feature (Photo 4).



Photo 4. Third cascade. Note Zack upstream with orange gloves.

Shortly after the third cascade the stream gradient decreased, but the channel remained well contained by bedrock (moderately incised) and was bordered by a clearcut 5-7 years old on the downstream right side. A short distance later the stream was bordered on both sides by clearcuts. We followed the stream until it abruptly became a large beaver complex near the middle of the watershed (Figure 1), then paralleled the stream using a temporary spur road for most of the remaining distance.

Upper Watershed (Upstream of Crossing on Road 6308)

USFS personnel assessed the culvert at the Road 6308 crossing and conducted a Tier 2 stream survey on 9/9/08 and 9/11/08. Fish crossings on the Tongass National Forest are categorized red, gray, or green according to passage conditions. The Road 6308 culvert met Tongass criteria for a red fish crossing; those having a high certainty of not providing juvenile fish passage at all desired flow levels (Photo 5).



Photo 5. Culvert crossing on Road 6308 is likely juvenile fish barrier.

Tier 2 Stream Survey

A Tier 2 stream survey was conducted in the Riparian Management Area (RMA) harvested in 1980 in the upper portion of the watershed (Figure 1). The habitat variables assessed were summarized and compared to standards for Tongass Fish Habitat Objectives for the MM1 channel type (USDA Forest Service, 2001) (Table 1).

Table 1. Little Gunnuk Creek habitat variables and comparisons to Tongass Fish Habitat Objectives.

Habitat Response Variables	Percentile	MM1	Little Gunnuk Values	Rating
WD	25	10.2		Fair
	25-50			Good
	50	14.2		
	50-75		18	
	75	22		Fair
TKWD/m	25	0.06		Fair
	25-50			Good
	50	0.12		
	50-75		0.13	
	75	0.14		Excellent
Pools/km	25	50		Fair

	25-50			Good
	50	60		
	50-75			
	75	70	114.67	Excellent
Pool Size (rpd/avbfd)	25	0.83		Fair
	25-50			Good
	50	1.25		
	50-75		1.84	
75	1.91		Excellent	
RPD/CBW	25	0.07		Fair
	25-50			Good
	50	0.08		
	50-75			
75	0.10	0.11	Excellent	
Pool Space	25	2.80		Excellent
	25-50		3.14	Good
	50	4.00		
	50-75			
75	5.80		Fair	
Plength/m	25	0.38	0.34	Fair
	25-50			Good
	50	0.54		
	50-75			
75	0.70		Fair	
TLWD/m	25	0.27		Fair
	25-50			Good
	50	0.38		
	50-75		0.41	
75	0.51		Excellent	
D50	25.0	26.0	23	Fair
	25-50			Good
	50.0	35.0		
	50-75			
75.0	53.0		Fair	
Rel-Submerg	25.0	5.0		Fair
	25-50			Good
	50.0	7.1		
	50-75		7.46	
75.0	12.4		Fair	

The preliminary reach ratings based on this comparison indicate 20% of the reach is rated as “Fair”, 60% as “Good”, and 20% in “Excellent” condition. The two variables receiving “Fair” ratings included D_{50} , which is the median particle size of the stream substrate, and pool length per meter. The D_{50} is in the 25th percentile of variables but the value is not extreme. Based on site conditions this value is likely a reflection of the natural condition of this stream and does not indicate a degraded condition. Total pool length per meter is likely low due to the relative high numbers of plunge pools created by woody debris in the channel. These types of pools tend to be short in length, but deep, and offer excellent fish habitat.

Three blown-out beaver dams were encountered hiking to the Tier 2 survey site, upstream of the culvert on Road 6308. The beaver pond furthest upstream was approximately 67m long, averaged 20m wide, and was 0.8m deep. The dams were breached recently based on vegetation regrowth within the “pool” footprint, and the stream was actively scouring through the sediment, creating a new channel (Photo 6). Approximately 1000 cubic meters of sediment remained at the time of the survey and will likely be transported downstream as the channel migrates with natural flow fluctuations (Photo 7; Photo 8). Fine sediment was observed in the stream from these dams to the large beaver complex below the road crossing.



Photo 6. Recently breached beaver pond near stream survey site.



Photo 7. Fine sediment deposited in beaver pond.



Photo 8. Active channel migration through beaver pond sediments.

Recommendations

Following the Tier 2 stream survey and visual assessment of the length of Little Gunnuk Creek, we determined that potential restoration projects are minor. There appears to be at least one natural fish barrier approximately 150m above the old check dam. The cascades above the dam were natural, with no coho sighted above these features. The culvert on Road 6308 is likely a barrier to fish passage under certain flow regimes and during juvenile life stages of resident fish, which include cutthroat trout and Dolly Varden char. Resident cutthroat trout were seen upstream of the culvert below the beaver dams. No fish were identified downstream of the culvert, and none were seen above the cascade barriers, although resident populations likely occur throughout the stream.

Projects identified include the following:

1. Replacement of the red fish culvert on Road 6308.
2. Radio tagging adult coho near the estuary to assess passage up the natural barriers and the extent of stream utilization beyond.
3. Environmental education in the form of a “watershed watch” modeled program with the Kake High School.

The fish culvert on Road 6308 falls under the ownership of Sealaska Regional Corporation and its replacement will depend on interest levels and potential funding sources, most of whom will receive copies of this report. There is a relatively high amount of quality spawning and rearing habitat upstream of the crossing, and replacement would be beneficial for resident populations. We will continue to work closely with the Gunnuk Hatchery on the possible tagging of adult coho in the fall of 2009. While we believe the second cascade is a barrier to upstream migrating adults, this could be validated with careful field observation and radio tagging. Several original stakeholders in this assessment effort have expressed interest in an environmental education component involving Kake Public Schools. Perhaps the tagging and subsequent tracking could be integrated into such a program. Details about what the environmental education will entail will depend on coordination with interested parties.

Citations

USDA Forest Service. 2001b. Aquatic Habitat Management Handbook. U.S. Forest Service. Alaska Region: FSH 2090.21.

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