State of Alaska
Department of Fish and Game
Division of Sport Fish

Nomination Form
Anadromous Waters Catalog

M E

Region: 4 Southeast

USGS Quad(s): Ketchikan D-1

AWC Number of Water Body: 101-15-10500-2036-3010

Name of Water body: Marx Creek

☒ USGS Name ☐ Local Name

☐ Addition ☐ Deletion ☐ Correction ☐ Backup Information

For Office Use

Nomination #	140395	James J Hasbrouck, Fisheries Scientist	10/27/2014 Date
Revision Year:	2015	Habitat Operations Manager	10/27/14 Date
Revision to: Atlas ____ Catalog ____ Both ✓		AWC Project Biologist	9/29/14 Date
Revision Code:	A-2	GIS Analyst	10/6/2014 Date

OBSERVATION INFORMATION

	Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
200+	pink salmon	5/13 - 5/17/2014		X		☒
100+	coho salmon	5/13 - 5/17/2014		X		☒
(6)	chum salmon	5/16/14		✓		☒
						☐
						☐

IMPORTANT: Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat, locations, types, and heights of any barriers; etc.

Comments

FRP Permit SF2014-003 (Davila/Ketchikan Misty-Fiords RD Marx Creek near Hyder-local fish)

Picture DSCN2154.JPG

Name of Observer (please print): Jessica Davila

Signature: [signature]

Date: 9-26-14

Agency: USFS

Address: 3031 Tongass Ave
Ketchikan AK 99901

ALASKA DEPT. OF FISH & GAME
SEP 26 2014

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Anadromous Waters Catalog.

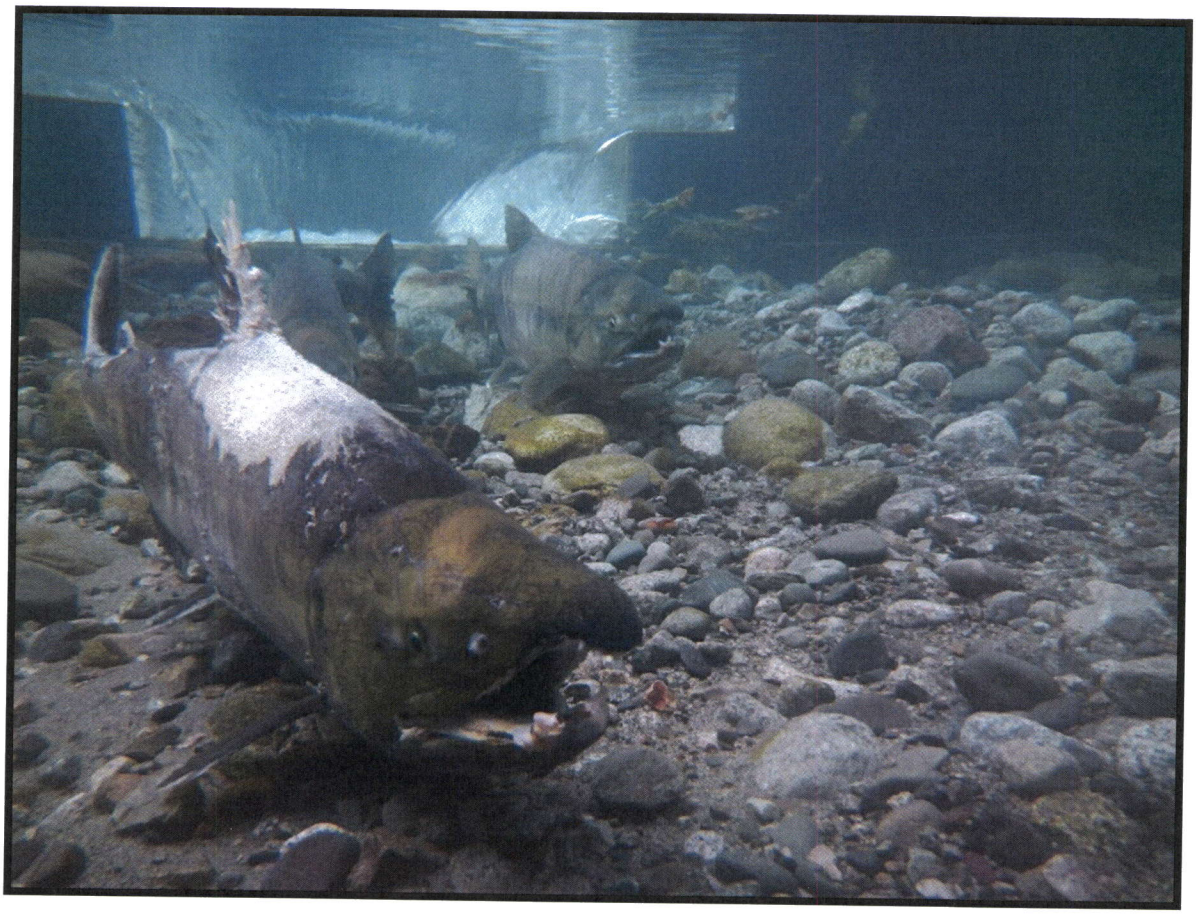
Signature of Area Biologist: [signature] Date: 9-26-14

Revision 11/13

Name of Area Biologist (please print): Jessica Davila Fisheries biologist KMRD

Add new stream w/ pink, coho, and chum salmon rearing

Marx Creek Habitat Enhancement Project
2014



Written for the Marx Creek Habitat Enhancement
Ketchikan-Misty Fiord Ranger District
Tongass National Forest

I. INTRODUCTION

This report is a review of the Marx Creek Habitat Enhancement project and will be updated and evaluated annually till 2018. Marx Creek is man-made spawning channel and an Alaska Department of Fish and Game (ADF&G) cataloged tributary to the Salmon River near Hyder, Alaska (Figure 1). Hyder is approximately 100 miles NE of Ketchikan, Alaska. The legal location of the project is Township 68 South, Range 99 East, Section 14, Copper River Meridian. USGS Map Ketchikan D1.

II. BACKGROUND

In the early-1960's a Jokulhaup (ice-dammed or "dumping lake") developed at Summit Lake in British Colombia, the headwaters of the Salmon River. Floods caused by the draining of the lake were very large and destructive. In the mid-1970's, the Hyder Road (State Route #290200) next to Fish Creek was damaged and portions of Fish Creek were severely scoured by the flood. Dikes were built to protect Fish Creek and the Hyder Road. Marx Creek was initially created in 1974, as a drainage channel to allow for construction of the dike. Supplied with groundwater sourced from the Salmon River and upland areas, and adequate amounts of gravel, the channel was well suited to be developed as a salmon spawning channel, particularly for chum salmon.

In 1985, 4,000 feet of the mile-long (Marx Creek) channel were reconstructed with the objective of producing more spawning habitat for chum salmon. Twelve redwood weirs structures were installed in a series of stepped down reaches for grade control. Each weir was notched and allowed up- and downstream movement of fish. After reconstruction, chum salmon were transplanted into Marx Creek from Fish Creek by the ADF&G.

In 1989, the Forest Service in cooperation with the ADF&G extended the Marx Creek spawning channel upstream an additional 1,600 feet to increase spawning habitat. Unfortunately, this extension was constructed in direct contact with a flood control dike. Due to the porosity of the dike, silty glacial water pass through the dike and enters Marx Creek when the Salmon River floods. Chum salmon have tended to avoid the spawning area adjacent to the dike in recent years, but they do spawn downstream of it. The possible reasons chum salmon do not use the area are due to the increase in fine sediment, subtle changes in groundwater temperature or subtle change in chemical composition, i.e., greater Salmon River water influence closer to the dike.

In 2006, the Tongass National Forest, Ketchikan-Misty Fiord Ranger District (KMRD) proposed to the Pacific Salmon Commission (PSC) to investigate the feasibility of constructing a second channel extension parallel to the 1989 channel, but approximately 500 feet east of the flood control dike. With funding from the PSC, the KMRD secured the assistance of a Utah State University graduate student and graduate professor. The groundwater analysis constituted Phase I of the project. Phase I was conducted in 2006, whereby, twenty well points were installed to profile groundwater flow in the proposed project area. MODFLOW (McDonald and Harbaugh, 1988) was used to model groundwater and estimate a "new" channels effect on the existing channel. The draft report (Lachmar, Nelson, Randall, 2007) indicated the proposed project area does have sufficient subsurface flow to support an additional channel. However, in order to address the sediment issue, it was recommended the portion of Marx Creek adjacent to the dike should be filled in.

In 2008-2010, Phase II constructed 2,000 feet of channel with the objective of producing more spawning habitat for chum salmon. Redwood weir structures were installed and replaced in a series of stepped down reaches for grade control. Each weir was notched and allowed up- and downstream movement of fish. Rehabilitation of channel spawning in existing channel was replaced to achieve ideal spawning gravel size. Large wood habitat structures were installed in the channel after weirs. The structures overhang the channel to add complexity and cover in habitat.

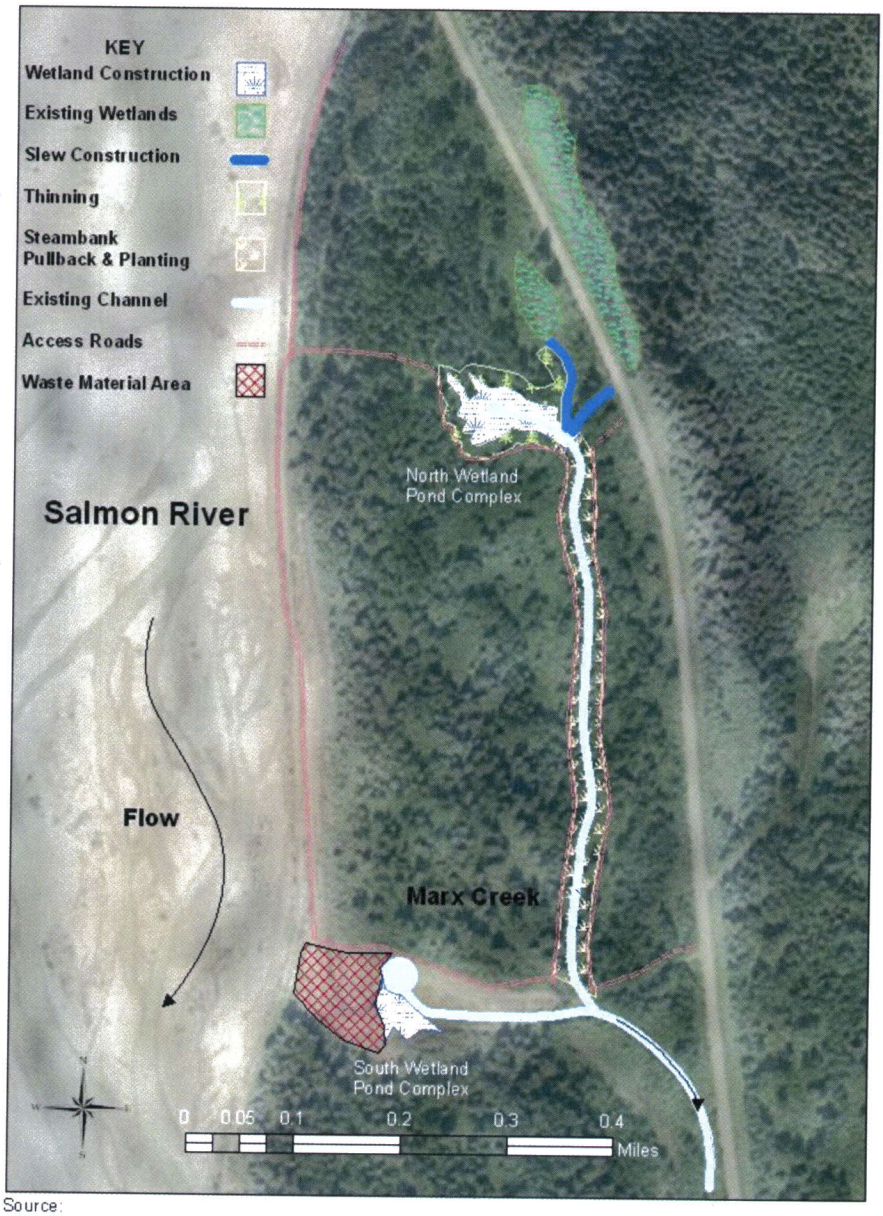
III. Purpose and Need

The 2013 configuration of Marx Creek was not providing optimal habitat conditions and utilization for chum and coho salmon for the following reasons:

1. Low water temperatures;
2. Lack of habitat complexity in upper 2,000 feet of Marx Creek; and
3. Low usage of the spawning channel by spawning or rearing salmon.

There was also a need to mitigate effects to wetlands caused by transportation improvement and construction activities in the lower Salmon River. The project additionally provided habitat and enhancement of existing habitat for riparian dependent wildlife species through revegetation efforts. The need for the project stemmed from chum salmon stocks of southern Southeast Alaska and northern British Columbia, particularly those in Portland Canal, being designated as stocks of special concern by the U.S./Canada Pacific Salmon Treaty, and nearby Fish Creek chum stocks were a Forest Service Region 10 sensitive species. Chum salmon are of special interest in southern Southeast Alaska because they provide the commercial fishery with the second highest catch in numbers and value of all salmon harvested. Because of their abundance and large size, chum salmon are also important for subsistence and provide valuable food for a variety of other animals.

Figure 1. Vicinity map for the Marx Creek Project area.



Source:
ESRI imagery
MarxCr-Proposed Actions_011813.mxd

Figure 2: Marx Creek Project location

IV. 2014 Construction

Work included:

- Modify the margins of the North and South ponds creating additional shallow water habitat. Up to 1.72 acres (0.7 North, 0.9 South);
- Rehabilitated and enhanced 1.72 miles of spawning channel stream banks through revegetation and slope adjustment;
- Reduce fine sediment in up to 11,733 square yards of spawning gravels; and
- Hand planted 2 acres with locally obtained vegetation along the margins of the stream channel.

Design Features

1. An erosion/sediment control plan in place (BMP 14.5)
2. During construction of shallow water habitat, the new area was isolated from the existing pond and stream for as long as possible in order to minimize sediment production. The last step of construction was to connect the new area to the existing pond or stream. (BMP 18.3).
3. Fish were removed prior to construction. Sites were partially dewatered to aid removal effort. Fish were handled in accordance with the Fish Resource Permit guidelines and returned to the stream downstream of the work area.(BMPs 14.15, 18.3)
4. Construction sites were dewatered during construction to minimize sediment input downstream by separating instream work from flowing water. (BMP 14.15)
5. A Forest Service fisheries biologist, fisheries technician and/or hydrologist was on-site during construction activities to monitor the project.

V. August 2014 conclusions

The ADF&G and USFS conducted three foot surveys on Fish and Marx creek on 7/28, 8/11 and 8/26. Although chum salmon numbers were still relatively low by 8/26, things looked much better than the first two surveys. 1,810 live chum were counted and 656 dead chum salmon in the creek, which was the highest on record since 2007. Our total escapement estimate for the year (based on an expansion using prior weir count/foot surveys) is 6,280 chum salmon (95% Prediction Interval= 4,334—9,100). The stretch of Fish creek along the bear observatory had very good numbers of pink and chum salmon. The overall pink salmon escapement at the creek looks very good and we counted over 20,000 fish. One thing that may help this year's chum salmon is that the abundance of pink salmon seems to have relieved some of the bear pressure on the chum salmon. In recent years with low chum abundance it often seems like we don't see any carcasses of spawned out fish because they are eaten as soon as they become weak. This year we are finding quite a few intact chum salmon carcasses and it seems likely the high density of pink salmon may have helped many of them get through the spawning process. The Marx Creek spawning channel also showed major improvement in the final survey. We counted over 700 chum salmon in the channel and fish were well distributed from the top of the new section down to the bear observatory. It looked like much of the best spawning substrate had fish actively spawning on it. Greater than 100 Chum were counted in the newly altered channel, which in the last years has seen less than 20 fish annually.

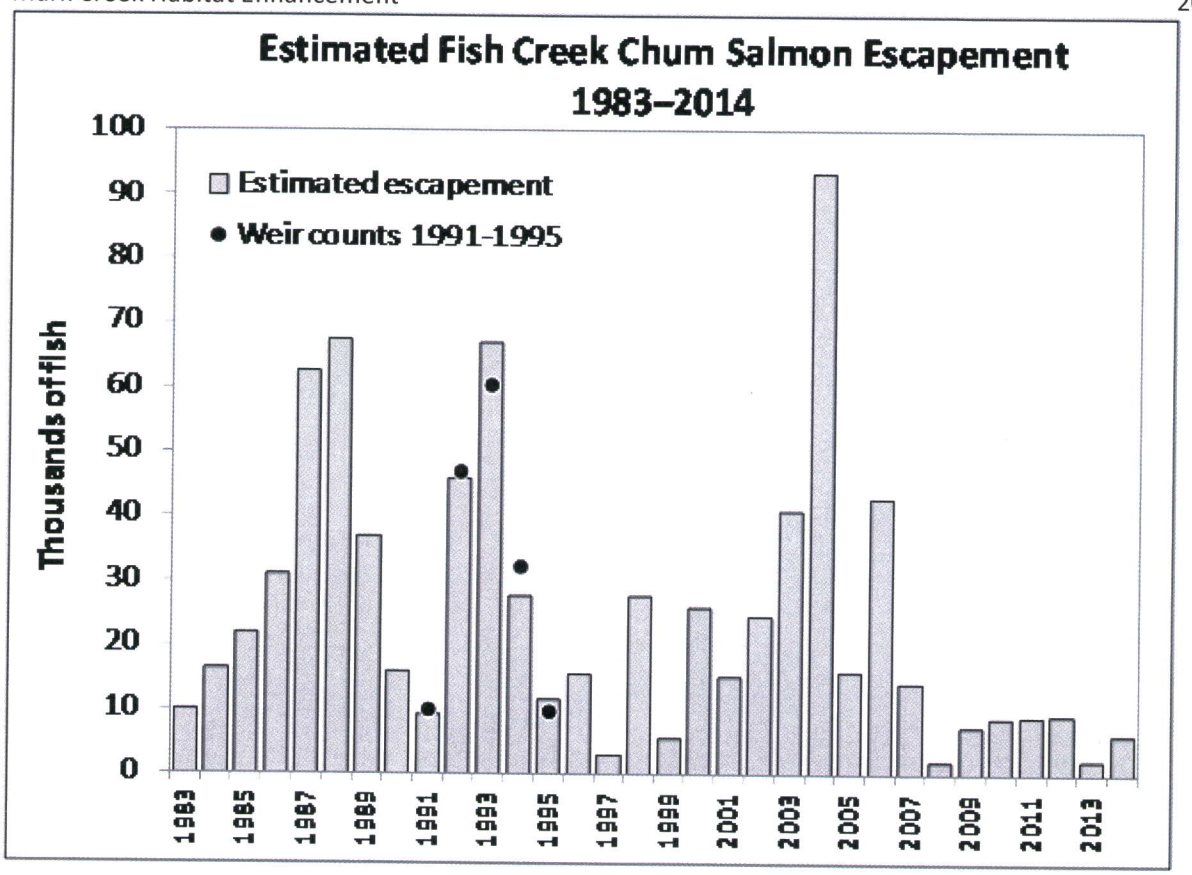


Figure 3: Estimated Fish Creek Chum Salmon Escapement counts since 1983 to 2014. Fish and Marx creek has been in a downward trend since 2004

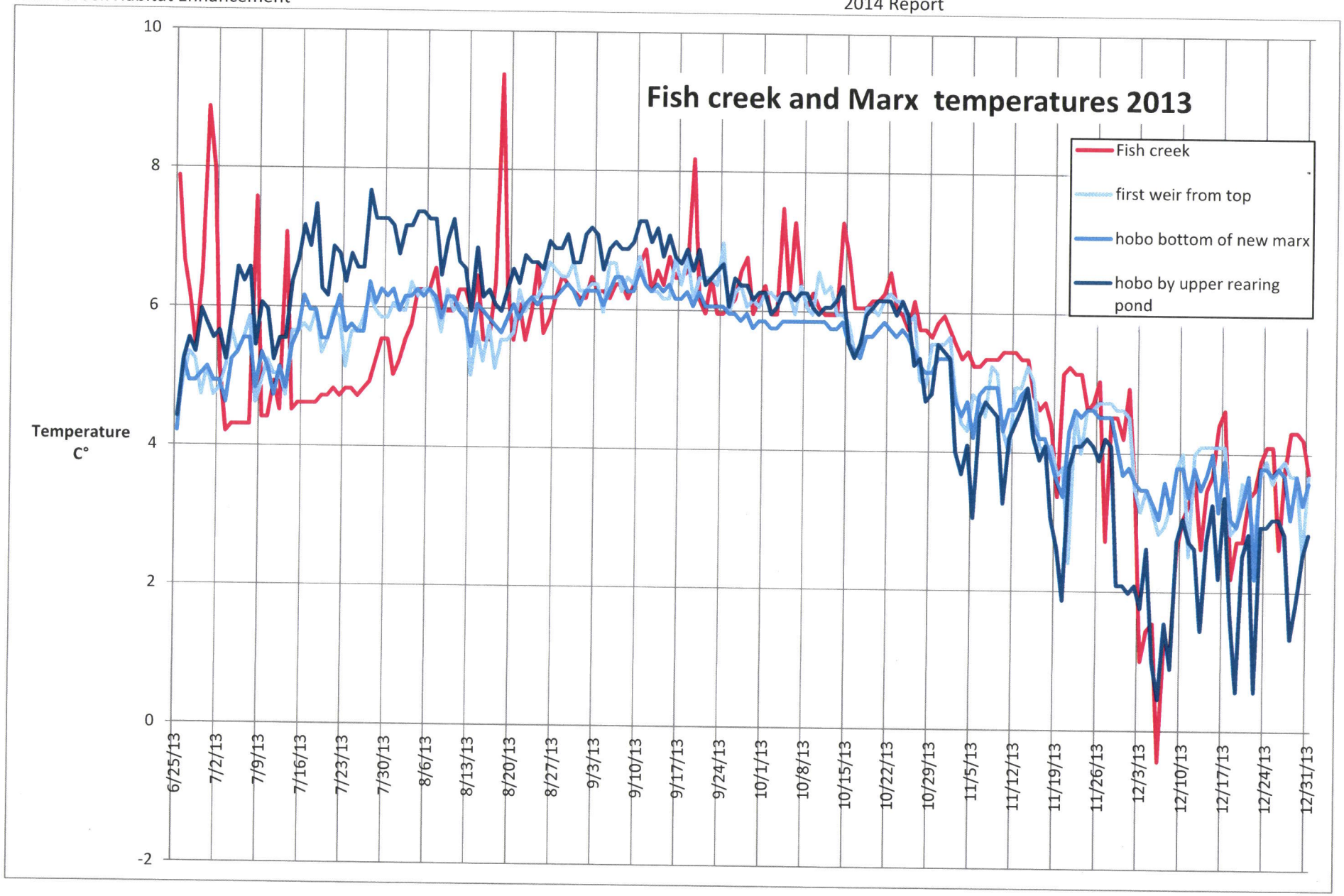


Figure 4: Fish and Marx creek stream temperatures in 2013. Marx Creek on average was 4.3°C and Fish Creek was 5.3°C. No construction activities occurred in 2013.

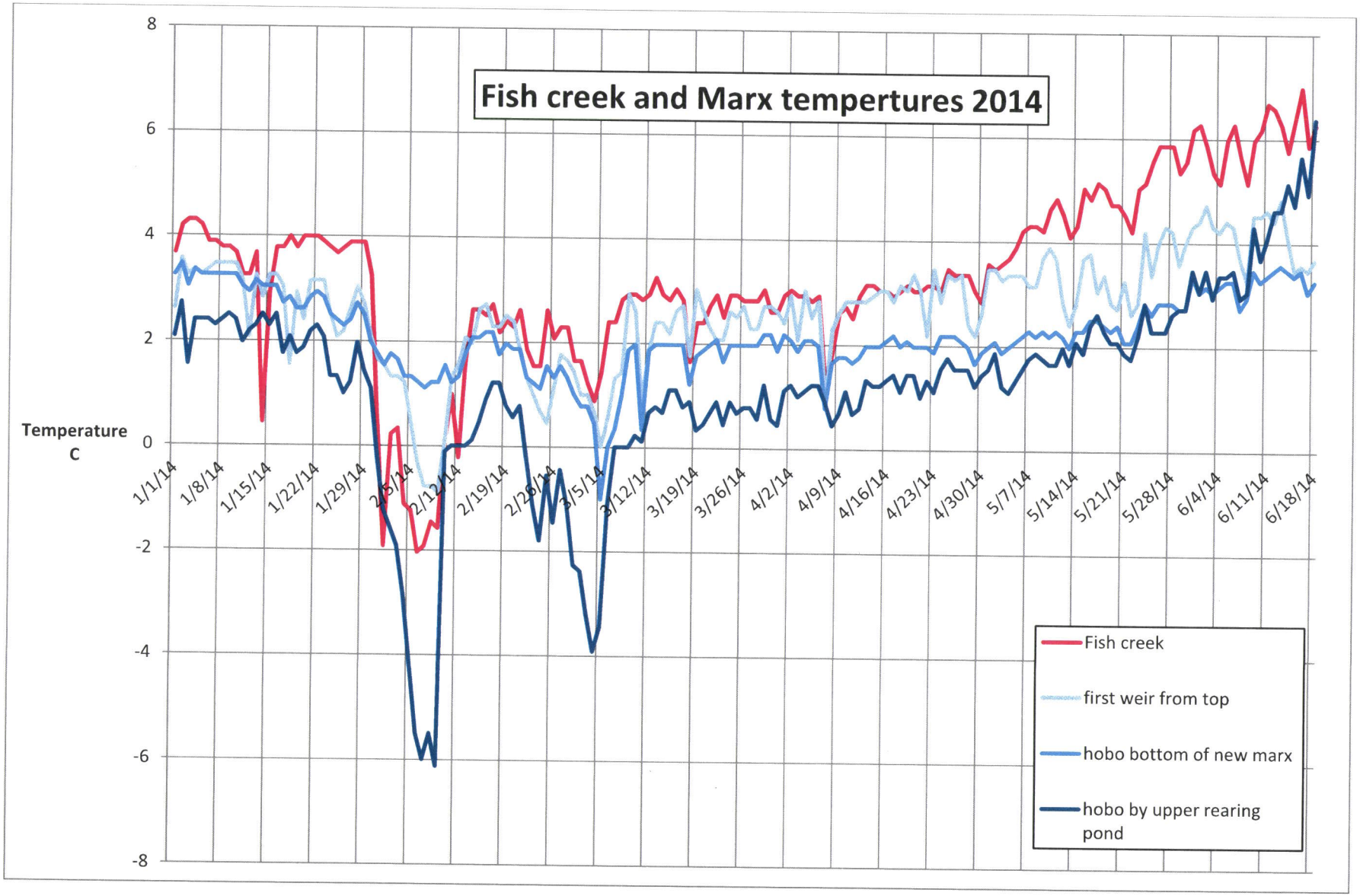
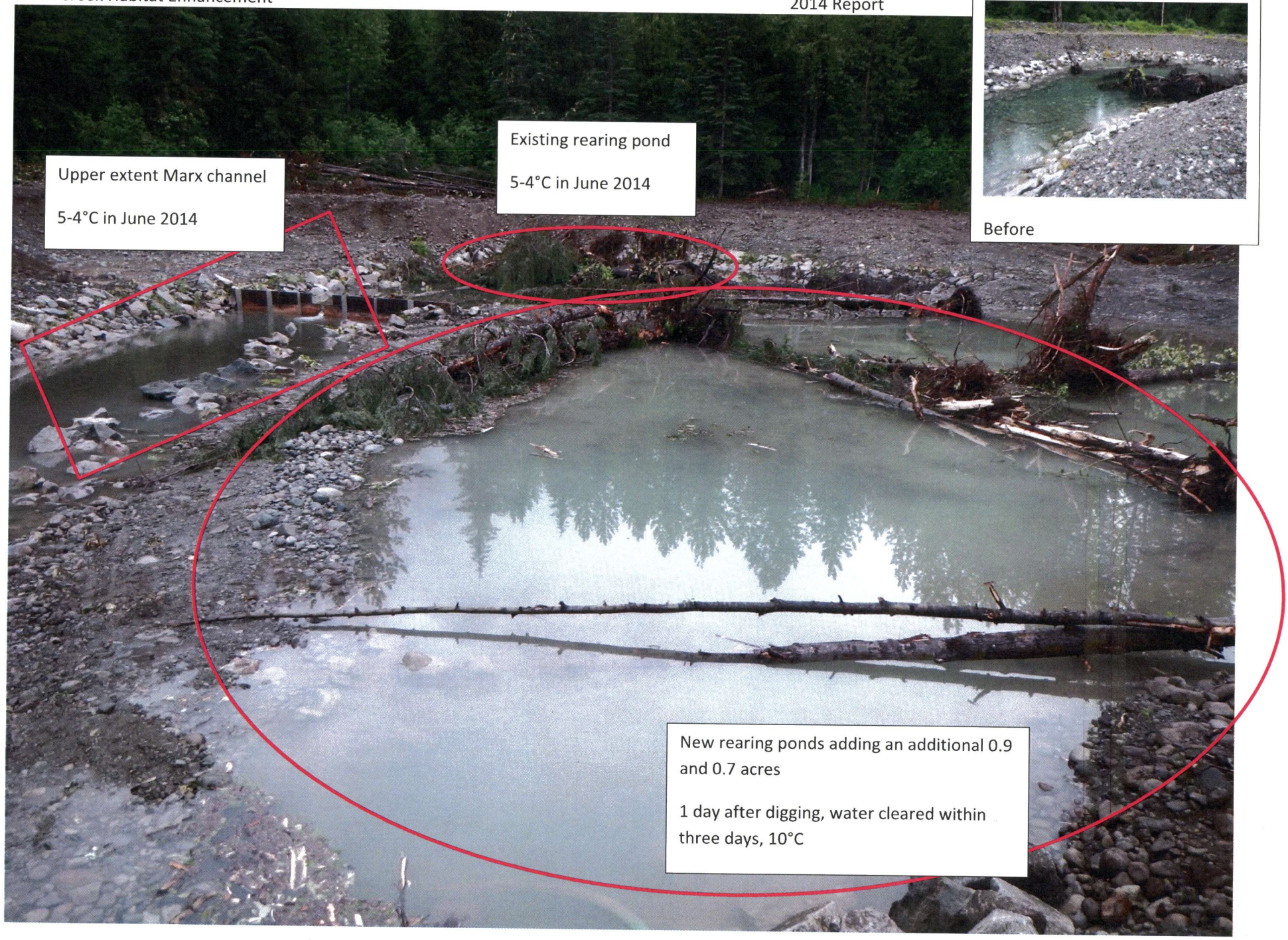


Figure 5: Fish and Marx creek stream temperatures up to June 2014. Marx Creek on average was 1.2°C and Fish Creek was 3.3°C. Stream temperatures downloaded before construction was completed in July of 2014. 2015 report will include all of 2014 stream temperatures and post construction data.

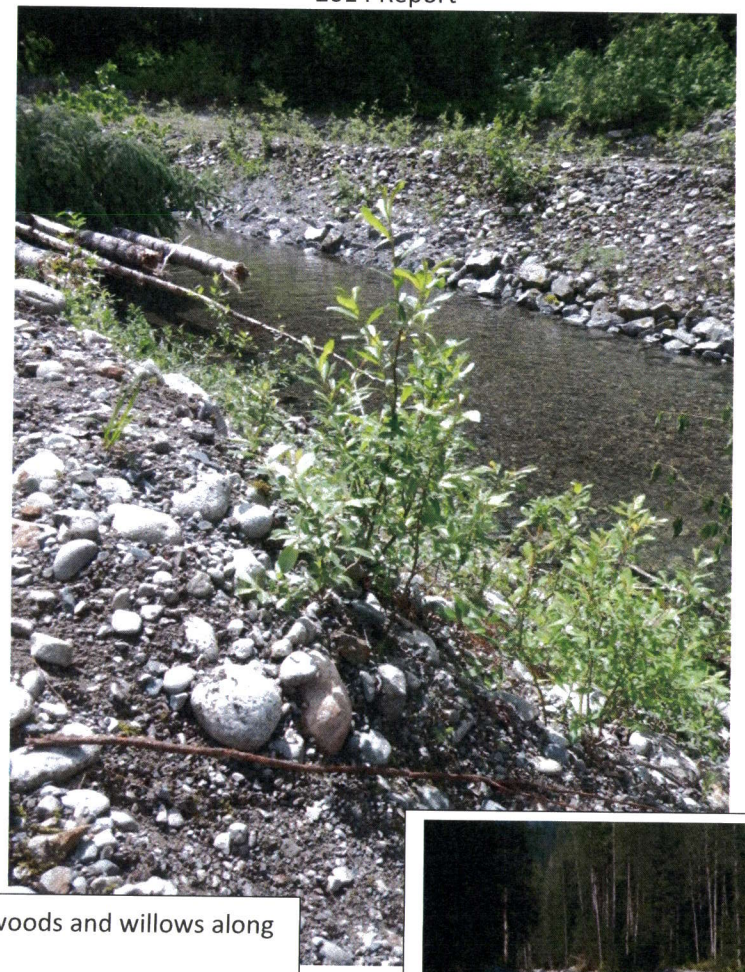

Upper extent Marx channel
5-4°C in June 2014
Existing rearing pond
5-4°C in June 2014
Before
New rearing ponds adding an additional 0.9 and 0.7 acres
1 day after digging, water cleared within three days, 10°C

After and Before

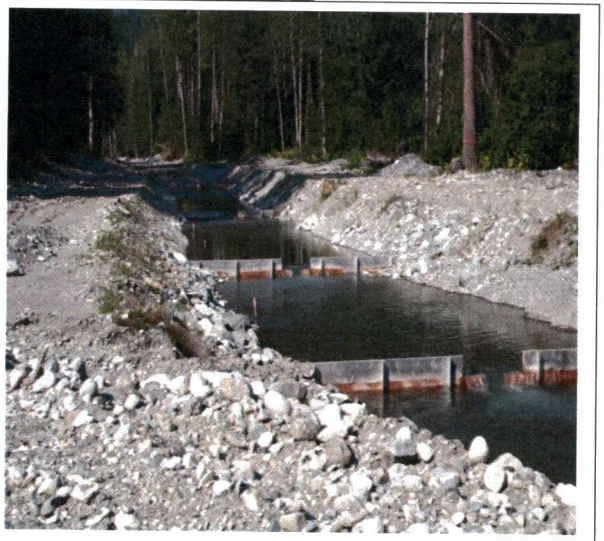
Instream cover, Observed the highest concentration of young of the year and Dolly Varden at upper Marx since construction in 2008 after cover was added in 2014.
1.72 miles of Marx creek benefited

Mark Creek Habitat Enhancement

2014 Report



2014 Two acres were planted with cuttings of cotton woods and willows along banks



banks – before

ADF&G permit no. SF2014-003

Summary report of fish collection activity.

The area biologist was contacted on: 4/29/2014

Location ID (optional)	Latitude	Longitude	Datum	Coordinate determination method	Name of water body	Date	Observer name (first name, middle initial, last name)	Fish collection method	Species	Life stage	Length (mm) No estimates/ranges	Length method	Weight (g)	Sex	Age	Age method	ADF&G GCL	Additional count (1)	Disposition (1)	Additional count (2)	Disposition (2)	Comments
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/13/2014	Jessica Davila	Minnow Trap	Dolly Varden	juvenile								19	ID'ed and released			less than 55 mm
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/14/2014	Jessica Davila	Minnow Trap	Dolly Varden	juvenile								25	ID'ed and released			less than 55 mm
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/15/2014	Jessica Davila	Minnow Trap	Dolly Varden	juvenile								22	ID'ed and released			less than 55 mm
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/16/2014	Jessica Davila	Minnow Trap	Dolly Varden	juvenile								10	ID'ed and released			less than 55 mm
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/17/2014	Jessica Davila	Minnow Trap	Dolly Varden	juvenile								5	ID'ed and released			less than 55 mm
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/13/2014	Jessica Davila	Minnow Trap	coho salmon	juvenile								45	ID'ed and released			
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/14/2014	Jessica Davila	Minnow Trap	coho salmon	juvenile								30	ID'ed and released			
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/15/2014	Jessica Davila	Minnow Trap	coho salmon	juvenile								25	ID'ed and released			
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/16/2014	Jessica Davila	Minnow Trap	coho salmon	juvenile								32	ID'ed and released			
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/17/2014	Jessica Davila	Minnow Trap	coho salmon	juvenile								12	ID'ed and released			
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/16/2014	Jessica Davila	Minnow Trap	chum salmon	juvenile								5	ID'ed and released			
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/13/2014	Jessica Davila	Other	pink salmon	juvenile								100	ID'ed and released			scooped out of stream with helmet
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/14/2014	Jessica Davila	Other	pink salmon	juvenile								50	ID'ed and released			scooped out of stream with helmet
	55.97476	-130.06508	WGS84	MAP	Marx Creek	5/15/2014	Jessica Davila	Other	pink salmon	juvenile								50	ID'ed and released			scooped out of stream with helmet
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					Marx Creek	5/13/2014	Jessica Davila	Minnow Trap	Dolly Varden	not applicable								19	ID'ed and released			
					Marx Creek	5/14/2014	Jessica Davila	Minnow Trap	Dolly Varden	not applicable								25	ID'ed and released			
					Marx Creek	5/15/2014	Jessica Davila	Minnow Trap	Dolly Varden	not applicable								22	ID'ed and released			
					Marx Creek	5/16/2014	Jessica Davila	Minnow Trap	Dolly Varden	not applicable								10	ID'ed and released			
					Marx Creek	5/17/2014	Jessica Davila	Minnow Trap	Dolly Varden	not applicable								5	ID'ed and released			
					Marx Creek	5/13/2014	Jessica Davila	Minnow Trap	coho salmon	juvenile								45	ID'ed and released			
					Marx Creek	5/14/2014	Jessica Davila	Minnow Trap	coho salmon	juvenile								30	ID'ed and released			
					Marx Creek	5/15/2014	Jessica Davila	Minnow Trap	coho salmon	juvenile								25	ID'ed and released			
					Marx Creek	5/16/2014	Jessica Davila	Minnow Trap	coho salmon	juvenile								32	ID'ed and released			
					Marx Creek	5/17/2014	Jessica Davila	Minnow Trap	coho salmon	juvenile								12	ID'ed and released			
					Marx Creek	5/16/2014	Jessica Davila	Minnow Trap	chum salmon	juvenile								5	ID'ed and released			
					Marx Creek	5/13/2014	Jessica Davila	Other	pink salmon	juvenile								100	ID'ed and released			scooped out of stream with helmet
					Marx Creek	5/14/2014	Jessica Davila	Other	pink salmon	juvenile								50	ID'ed and released			scooped out of stream with helmet
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CHr,CO,Pr
200+ Pr,100+ COr, 6 - CHr
add new stream 101-15-10500-2036-3010
w/chum, coho, & pink salmon rearing,
use NHD flowline for hydro
CHs,COsr,Ps
CHs,COsr,Ps
CHp
COr
COr
CHp
SALMON
AERIAL
TRAMWAY
Fish
Silver Falls
Slide
Creek
15
16
22
21
23
2500
1000
200
600