Owikeno Lake – 2005 Coho DNA Baseline Sampling Program

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Overview

Identifying salmon stocks through the use of DNA microsatellite variation has become a useful tool in the management of pacific salmon stocks. In order for fisheries managers to determine fishery stock composition, it is necessary to have sufficient baseline data against which to compare unknowns. This information can be very useful to fisheries managers whose job includes avoiding the over-exploitation of weaker stocks.

The more DNA samples that are included in the baseline the more likely the microsatellite variation specific to a particular stock can be identified. DFO geneticists have established a benchmark of 200 DNA samples per stock to provide sufficient baseline information for analysis of mixed-stock fisheries samples.

In 2005, a Pacific Salmon Foundation proposal was approved and funded through the Rivers and Smith Salmon Ecosystem Planning Society (RSSEPS) to collect baseline DNA samples from coho in the Owikeno Lake drainage basin. The target systems for DNA sampling were the Washwash, Genesee, Amback, and Dallery. Coho DNA samples were collected by means of live capture and carcass recovery. Run timing, the number of live and dead fish, and river conditions were also recorded, along with any opportunistic biological data.

The program consisted of two stages. For Stage One, sampling was conducted in the upper and middle basins of Owikeno Lake. DFO Stock Assessment staff provided expertise, training, and materials while working with the Wuikinuxv Fisheries crew. For Stage Two, the Wuikinuxv Fisheries program conducted sampling in the lower basin of Owikeno Lake.

Methods

The 2005 Owikeno Lake Coho DNA Baseline Sampling program was conducted between November 22nd and December 1st. The project involved two stages of operation. Stage One outlines efforts and training that ran from November 22nd – 25th with DFO and Wuikinuxv Staff working together on the middle and upper basin. Stage Two summarizes efforts by the Owikeno Crew on lower basin streams

Stage One

Stream Inspections

Initially, stream surveys were conducted to assess coho presence/abundance. These surveys were conducted using a crew of 2-4 people walking the creeks and examining potential spawning areas, while scouring pools and cutbanks.
A diver in a dry suit was also used to enumerate coho in log jams and cutbanks. Stream conditions, fish enumeration, and biological data were recorded using the North Coast stream inspection logs.

Capture

Where possible, attempts were made to capture live adults. Capture methods included the use of small gill nets, dip nets or capturing coho by hand.

Sampling

Adult coho were sampled for sex and length (POH / Nose-fork). Individual scales and bulk DNA samples were collected where possible. North Coast stream inspection log forms.

Stage Two

Stream Inspections

Two to four members of the Wuikinuxv Fisheries Program were dispatched from the Owikeno village to survey lower basin systems and conduct capture where feasible.

Capture

The Owikeno crew did not have a gill net or a dive suit for the second part of the program and the only capture method used was a dip net.

Sampling

Sample guidelines were not adhered to as prescribed by DFO staff. For this reason, some of the biological samples collected during the program could not be used.

Results

Genesee Creek – Three streamwalks were conducted during November 22nd and 23rd. The first walk was strictly a reconnaissance inspection of most of the system. During the initial inspection, 12 coho were observed and 30 coho were estimated. Several redds were noted in the upper section but no coho carcasses were recovered for sampling. Two live and two dead sockeye were also noted. Water levels appeared to be above normal for the time of year and there was minimal bear activity.

Later that same day, a second inspection was completed. During the inspection, an attempt at capture yielded 3 coho. These fish were caught by holding a dip net in place

and scaring the coho into the net. All three fish were sampled and recorded as per sampling guidelines.

On November 23rd a diver in a drysuit was used to recover samples. The diver was able to thoroughly investigate all potential holding areas and 12 fish were captured for examination, of which 3 were recaptures from the previous days' efforts. In terms of enumeration, the diver's assessment of the creek was consistent with the original stream survey.

Washwash River – One streamwalk was conducted on November 23rd but high water and slightly turbid conditions hampered visibility in potential holding areas. With the latter water conditions and adverse weather conditions (thick fog on the lake), the walk was called off after examining the lower reaches (#1 and #2). No live coho or coho carcasses were observed in the inspected areas. No redds were sighted in the surveyed area and high water conditions prevailed throughout the duration of the project. It should be noted that coho were observed in the lower sections of the Washwash River in late September / early October during the fall sockeye stream inspections.

Marble Creek – Lower sections of Marble Creek were inspected for coho on November 24th. A crew of four assessed both braids of the creek up to the logging road bridge. There were 15 coho observed, but high water conditions hindered any possible capture attempts. Redds were observed in lower section of the west arm as well as a couple of kelts. No coho carcasses were observed

Amback Creek – The Wuikinuxv Fisheries Program conducted three inspections of Amback Creek. No fish were observed during walks on November 18th and November 29th. A total of 15 fish were counted on December 30th. Four samples were obtained on these walks. Coho were also observed in this system in early October during the sockeye enumeration program.

Meadowese Creek – The Wuikinuxv Fisheries Program conducted one streamwalk of the Meadowese Creek in which 7 coho were observed. High water and turbidity hampered visibility but one sample was obtained. No mention of redds was made in Stream Inspection Logs.

Summary

A total of eighteen DNA samples were obtained from the various streams surveyed. Coho were confirmed to be present in all of the systems surveyed although for the Washwash, adult coho presence was based on observations from early October during the sockeye enumeration program.

In all systems surveyed there was visual evidence of spawning activity but most fish observed were located in the deeper pools and underneath debris and logjams. Based on the limited observations, it is tough to accurately assess populations, run timing or the

peak spawning. However, coho were observed "flipping" at the mouth of Genesee Creek on November 25 after the crews had left the camp.

DNA baseline data was obtained and the logistics involved in the collection of samples were investigated. Coho spawning areas were identified and this information will be very useful for future programs of this nature.

Recommendations

Though the visit to the systems in Owikeno Lake (November 21-December 1) was within coho run timing parameters for Central Coast streams, unseasonably high water levels hampered catch / observation efforts. I would suggest consultation with the Wui'Kinuxv Fisheries personnel prior to commencing the program. Furthermore, with coho observed flipping in Owikeno Lake on November 25, questions still remain surrounding the run timing of the Owikeno Lake coho stocks. Further investigation, later in the season, is necessary to determine the full extent of the spawning time of these coho stocks.

Coho were accessible for capture and DNA sampling as early as mid September in 2005. There should be earlier, more concentrated efforts in the Sheemahant, Neechanz, and Washwash Rivers based on observations made during the 2005 Owikeno Lake Sockeye Fall Enumeration Program. Potential exists for netting and angling coho in any of the aforementioned systems.

Using an experienced diver for coho enumeration and capture is essential for future coho DNA programs. This was evident in a small system such as the Genesee Creek, which has a large amount of cover (undercut banks and log jams).

SEE TABLE 1

TABLE 1

Date	Stock	Fish #	Sex	POH	NF	DNA	Scales
Nov.22	Genesee	1	F	725	850	Y	Y
Nov.22	Genesee	2	M	415	570	Y	Y
Nov.22	Genesee	3	M	570	715	Y	Y
Nov.23	Genesee	4	M	565		Y	Y
Nov.23	Genesee	5	M	600	730	Y	Y
Nov.23	Genesee	6	M	350	440	Y	Y
Nov.23	Genesee	7	M		580	Y	Y
Nov.23	Genesee	8	F	560	630	Y	Y
Nov.23	Genesee	9	F	610	760	Y	Y
Nov.23	Genesee	10	F	540	650	Y	Y
Nov.23	Genesee	11	F	595	720	Y	Y
Nov.23	Genesee	12	F	590	730	Y	Y
Nov.29	Amback	13	UNK			Y	N
Nov.29	Amback	14	UNK			Y	N
Nov.29	Amback	15	UNK			Y	N
Nov.29	Amback	16	UNK			Y	N
Dec.01	Meadowese	17	M			Y	N