

Technical Memorandum

2012/13 Fish Utilization Report

Maxwelton Watershed

To: Marine Resources Committee of Island County, Salmon Recovery TAG, WDFW, and Island County.

Regarding: Maxwelton Watershed Spawning Survey and Smolt Count, performed by Whidbey Watershed Stewards

Date: July 3, 2013

Introduction

In 2006 the Island County Conservation District and Diking District #2 replaced the tide gate doors at the mouth of Maxwelton Creek for the purposes of improving the functioning of the gate for flood prevention and fish passage. In the fall and winter of 2006/7 the Wild Fish Conservancy (WFC) surveyed the creek for evidence of salmon and spawning activity to analyze the ability of fish to navigate the tide gate. They produced a report in 2007 with recommendations for improvements that included data from the 2003/4 WFC Maxwelton fish utilization study, along with out-migrating smolt surveys from Whidbey Watershed Stewards (WWS) during 2004-7. In subsequent years, both the spawning survey and smolt count have been performed by WWS volunteers trained by WFC, and since 2009 the program has been coordinated by the WWS staff biologist. Reporting for the smolt count and spawning survey were made available to funders and permitting agencies in separate formats due to funding and permitting requirements, but starting in 2013 they will be combined to provide a more comprehensive report on monitoring efforts.

2012/2013 Spawning Survey

On December 12 and 18, Whidbey Watershed Stewards conducted salmonid spawning/pre-spawn mortality surveys on previously selected index reaches of mainstem Maxwelton Creek on Whidbey Island. This survey has been conducted annually since 2006. Whidbey Watershed Stewards staff and volunteers previously trained by a Wild Fish Conservancy biologist conducted all surveys. Survey objectives were to characterize the current state of salmonid spawning and in-stream conditions in the Maxwelton Watershed.

The survey in 2012/13 covered established parcels that had been investigated during previous seasons on property where permission has been granted. These parcels have previously had spawning activity on them, and although the survey is limited to the lower reaches where we have landowner consent, this set of properties has been consistent each year. This year the Quade tributary was not surveyed since habitat conditions and culvert conditions had deteriorated there in the past 2 years. Sediment has now covered all the

gravels in the lower Quade reach, and the culvert had become a complete barrier to fish as more than half the culvert was filled with sand.

It should be noted that salmon have been reported returning to the creek as early as the end of October in the past, and the 2012/2013 survey was particularly short, occurring only in December. No spawning adults were found during the previous two seasons, and funding availability limited effort during this current year. Discoveries of fish carcasses are often reported to WWS by local residents, and this did not occur at any locations for the previous 2 years.

Spawning Survey Results

Spawning survey observations are listed on Table 1, along with the smolt count results. Each survey covered the same sections of the main stem of Maxwellton creek. We surveyed only the mainstem of Maxwellton in the lower reach using the same protocols as in previous years. Three people conducted all of the surveys: Robin Clark, Watershed Program Manager for WWS, and two WWS board members, Bob Gentz and Lee Chavez, both trained by WFC in past survey efforts.

Written summaries for each survey are provided below:

December 12, 2013

The survey was conducted mid-day on a cloudy but dry day. Flows during the survey were moderate to high, and visibility was average. Readings from Island County gauges at culverts along French Rd. were recorded to quantify the relative stream height at the time of the surveys. The Maxwellton Creek gauge was 1.4, a moderately high flow. Water temperature was 45 degrees Fahrenheit, our typical temperature for December. Observations on clean gravels indicated that there had been little activity in the creek, with all gravels very flat, and no potential areas of sorting that could be confused with redd construction. One fresh carcass was observed, a spawned out female in the area just below the location where WWS had previously removed a failing culvert. This habitat is in excellent condition now, as the former culvert plunge pool has re-sorted and formed excellent gravel beds with consistent overhanging vegetation and channel complexity. No redd was apparent, and no male carcasses were observed.

December 18, 2013

This survey was also conducted on a cloudy, but rainless day. The gauge reading was at 1.9', a high flow situation which makes visibility and surveying difficult. This is approximately bank full height. Temperature was noted at 41 degrees Fahrenheit, although variation in thermometer readings was suspected. A second spawned out female carcass was found just upstream of the first one, in the location where the culvert had been removed in 2010. Again, no redds were evident and no male carcasses were found, but there were only a few eggs remaining in the carcass.

Smolt Count Summary

Whidbey Watershed Stewards has been conducting a smolt count on the main stem of Maxwellton Creek at the French Rd. culvert for the past 9 years, 2005-2013. The trap was constructed in 2004, and has been kept in good repair and managed by Gregg Ridder. Each year a scientific collection permit is obtained, and data is reported to WDFW on their data reporting form, and a report to the MRC has been made when funding was supplied by them. The trap is generally installed on May 1, and taken out on June 1. The culvert system under French Road has two 24" culvert pipe. The trap flume is attached to the eastern-most culvert pipe, and the western pipe is closed off with a piece of plywood, diverting all of the flow through the eastern pipe and the trap. During the course of the month, it is often necessary to allow water to bypass the trap by removing the plywood from the western pipe due to high flows or to remove the flume entirely from the culvert to avoid damaging the trap. Thus, the effort has never been able to capture 100% of the outmigrating smolt, but represents a relative measure of the population with conditions being somewhat variable each year.

Each year volunteers are recruited and contacted to participate in the smolt count. Training for new volunteers is done on an individual basis, and new volunteers are paired with someone familiar with the protocol and operation of the trap. This year Gregg Ridder, Bob Gentz, Susie and Luca Fallows, Wendy Visconty, Mellissa Holmes, Gillian Beattie, Gordon Marvin, Sandy Shipley, Lee Chavez and Robin Clark were the volunteers tending the trap.

The trap was installed on April 30th, 2013 and brought online on May 1. Six coho smolt were captured on the first day of effort, and this likely indicates that fish had already begun their outmigration. Water conditions in the creek were low as little rain fell during late April and early May. Flood stage water flows started during periods of no rain on May 15th. The western culvert was unblocked to allow flow to bypass the trap during several days. Following the high flows, the water receded so that some adjustments were made to the trap to allow for enough flow to remain in the flume. Over a period of a week high and low flow condition continued. Extreme high and low flows made keeping the appropriate amount of water in the flume difficult, and we experience one fry mortality due to stranding in the flume during low flow.

This year there was a large decrease in cutthroat smolt, and a continuing decline in the number of coho smolt and fry. The current number of smolt is approximately one quarter of the population found in 2009, although the fish are large and healthy. In each of the past few years, the trap must be removed or bypassed at least some of the time, and the count is a general indicator of the population trend rather than an absolute number of fish present. In 2014, we propose to begin the survey in mid-April to see if an earlier out migration is occurring, but given the combined results of the spawning survey and the smolt count we do not believe we are missing a large section of the population.

Fish Utilization

The fish utilization summary is in Table 1, and the Table 2 graphic shows the smolt count results for the years 2005-2013. No population augmentation has been conducted in the Maxwelton system since 2003, the last year when school groups released fry from an egg rearing programs offered by WDFW. The population levels are extremely low given the healthy habitat present throughout 19 miles of stream and wetland in the watershed.

Given that the fish utilization investigations are intended to gauge fish passage at the tide gate, it is clear that functioning of the tide gate has not increased fish passage and further monitoring of the gate should be undertaken. The recommendations offered by WFC in 2007 have not been implemented, and they should be considered before the population disappears entirely.

Table 1: fish utilization in Maxwelton and Quade Creek

Coho Salmon Observations	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013
<i>Reach A Mainstem Maxwelton</i>										
live salmon	1	12	X	2	0	0	0	0	0	0
carcasses	2*	X	X	1	0	0	1*	0	0	2
redds; all confirmed and unconfirmed	10	X	X	2	1	2	4	0	0	0
coho smolt only#	X	19	64	3	10	114	18	28	17	25
<i>Reach C - Quade Creek</i>										
live salmon	X	X	X	1	0	0	0	0	0	0
carcasses	X	X	X	0	0	0	2	0	0	0
redds; all confirmed and unconfirmed	X	X	X	2	0	0	4,3 [^]	0	0	0

* carcasses that may have been placed, not from live spawning salmon

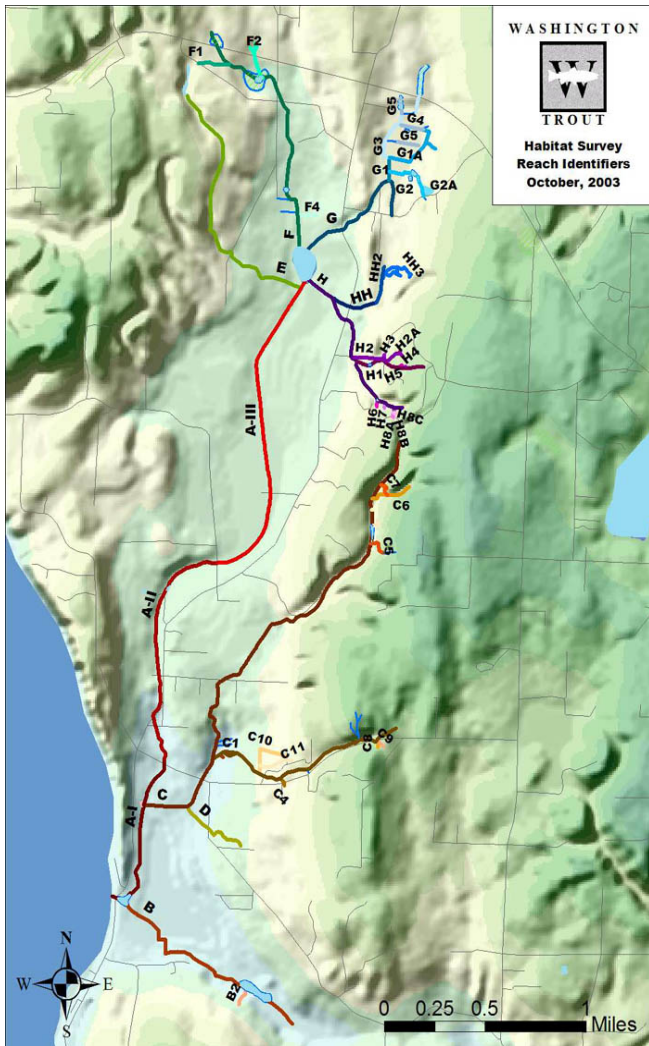
[^] carcasses or redd counted on each survey day separated by a comma

#smolt count occurs in May following the last year noted.

Future Inquiry and Recommendations

In the 2012/13 season, WWS was able to continue the effort to survey for fish utilization of the creek, but several important questions remain about the fish population in the Maxwelton system.

Map 1: Wild Fish Conservancy Maxwelton Stream Reaches



It appears that fish are very limited in their able to gain access to the watershed. Historic reproductive population would have been in the range of 10's of thousands of fish for this system, and the population is far below sustainable levels today. The only way to assess the functioning of the tide gate would be to monitor the gate itself, and assess if salmon were able to get through the outlet pipe and tide gate vaults. In addition, improvements to the outflow pipe, and functioning of the doors may be possible without detrimental effect on flooding if an evaluation was conducted. At present, the only proxy available to judge the passability of the gate is to find adult salmon in the creek, and to make assumptions about the natal population.

In 2010 spawning activity was found in the Quade Creek tributary, and further investigation into that reach was recommended. A blocking culvert on Wildes Rd. was identified, and listed on the Island County replacement list. In 2011 the condition of the spawning habitat in the Quade tributary deteriorated significantly, and spawning gravels were covered by 6-8 inches of sand. The culvert was nearly entirely blocked by sand until county crews cleared it in fall of 2012.

This culvert is undersized, and a bottomless culvert should be a priority for this site. Also, the sediment problems in the system should be identified and remedied if possible.

Other culverts identified as partial blockages, or velocity blockages have changed since the monitoring effort in 2003. These culverts should be re-evaluated and further fish passage projects in the valley identified. This evaluation should be compared with the structural condition report by the county, and priorities established. In particular, the mainstem Maxwelton culvert under French Rd., and Erikson Rd. have both deteriorated, and should be evaluated.

Island County has been conducting outreach efforts in the watershed as part of a source identification and pollution reduction program. Monitoring efforts to measure flows should continue and be incorporated into management of the gate and associated hydrolic activity in the valley.

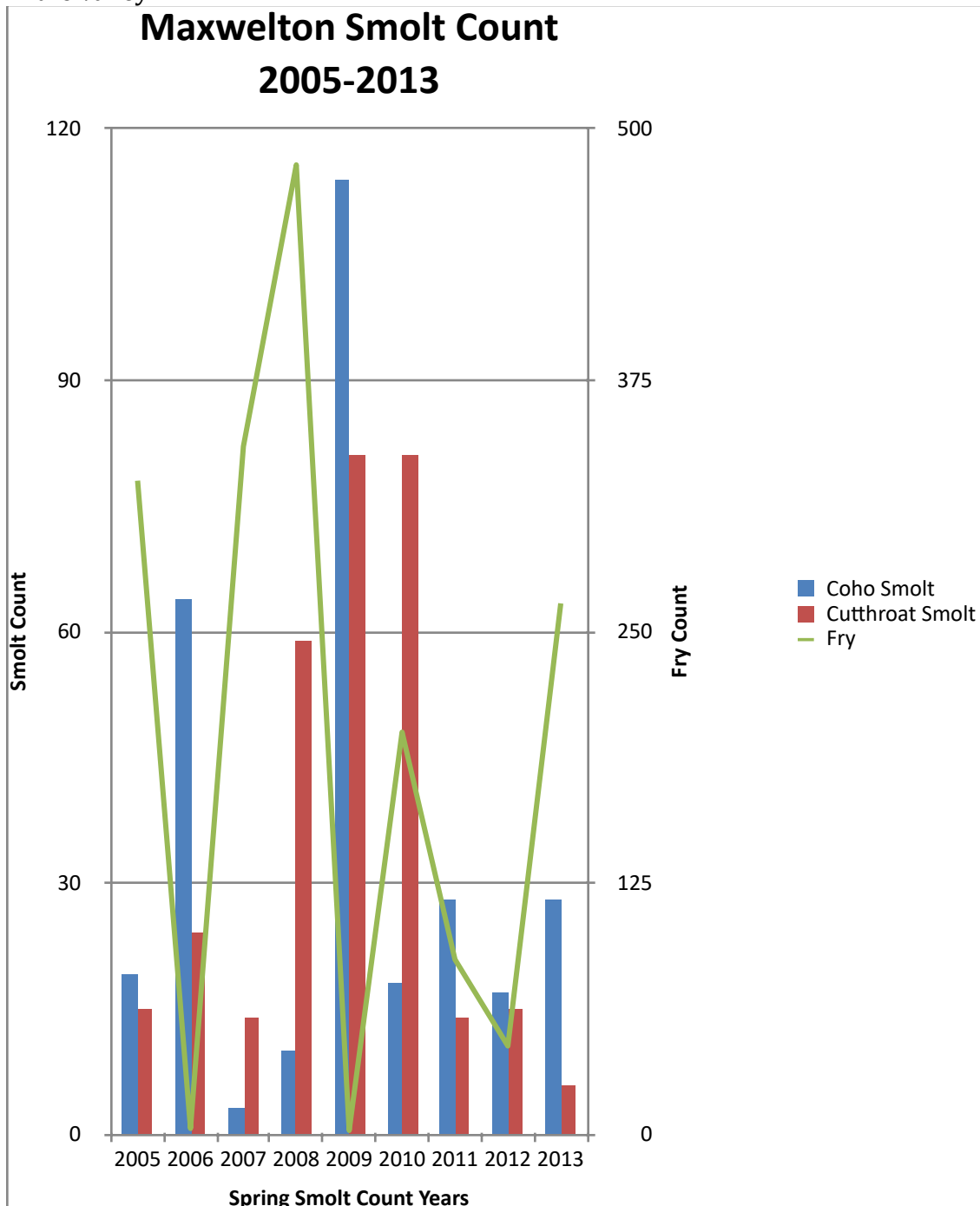




Figure 3: spawned salmon from Maxwellton Creek 12/15/13



Figure 4: Smolt photo by WWS volunteer