

Tucannon River Programmatic

Project #: 2010-077-00

Contract #: 56233

Annual Progress Report

(Reporting Period February 2012 to January 2013)

Contractor

Snake River Salmon Recovery Board

Contract Number 56233

Steve Martin, Director

Kris Buelow, Project Manager

Contact Information:

SRSRB Office,

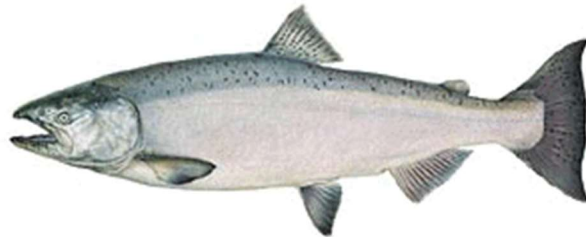
410B E Main St.

Dayton, WA 99328

509-382-4115

steve@snakeriverboard.org

kris@snakeriverboard.org



Abstract:

The Tucannon River Programmatic (Programmatic) project 2010-007-00 is managed under the contract 56233 by the Snake River Salmon Recovery Board (SRSRB). The purpose is to provide support in completing the goals and objectives of the Programmatic during this 2nd year of implementation. The SRSRB maintained and convened two committees (Tucannon Technical Committee and the Regional Technical Committee) which prioritize restoration actions and projects in the Tucannon River for the purpose of improving spring Chinook habitat.

Tasks completed in 2012 included project identification and prioritization into a long term work plan, partner technical support, public outreach, project and habitat data compilation and project database management. The SRSRB managed the completion of the Tucannon River Conceptual Restoration Plan for Reach 5, the finalization of Project Area 14 final design, development of preliminary designs for Project Areas 15 & 24.

The Programmatic in coordination with WDFW, USFS and CTUIR completed the implementation of Project Area 10 in August 2012. WDFW and SRSRB completed pre and post project monitoring in association with implementation and will continue to monitoring the project as it matures.

In 2012 the SRSRB allocated its FY 2012 implementation funding to the final design and implementation of Project Area 14 for implementation in 2013. Additionally, the SRSRB allocated funds to the completion of final designs on Project Area 15 to be completed in 2013 for implementation in 2014. SRSRB in coordination with CTUIR and the TCC & RTT began development on Project Area 3 with the CTUIR developing a preliminary design which has been approved through the committees. CRUIR is currently working on a contract requisition with BPA.

The SRSRB coordinated and provided Programmatic funds to supplementing the collection of ChAMP monitoring sites on the Tucannon in correlation to active restoration project. The purpose of this activity was to provide pre/post implementation data for project completion. Additionally, the SRSRB coordinated funding to secure Ecologic Inc. to aid in the development of its habitat monitoring plan.

Table of Contents:

Section	Page#
Abstract:	2
Introduction:	7
Study Area:	8
Implementation Approach:	9
Work Element Methods And Results Deliverable Reporting:	10
Program Implementation:	10
Program Guidance and Create Project List:	11
Develop Effectiveness Monitoring Plan:	13
Effectiveness Monitoring:	13
Community Involvement and Education:	18
Data Management:	19
Conduct Environmental Compliance:	19
Transport and Store LWD for Future Project Needs:	20
Citations:	21
Tables:	22
Figures:	31
Appendix A:	50
Appendix B:	52

Introduction: Tucannon River Programmatic Habitat

The Snake River Salmon Recovery Board (SRSRB) serves as the Lead Entity for salmon recovery in the Washington State portion of the Snake River and its tributaries, guiding funding for the Salmon Recovery Funding Board (SRFB). Beginning in 2011, the SRSRB was awarded a project (# 2010-077-00) from Bonneville Power Administration (BPA) and as part of that project an administrative contract to manage the Tucannon River Programmatic (programmatic) on the Tucannon River in South East Washington, through 2018. This report covers work completed under contract #56233 between February 1, 2012 and January 31st 2013. The objectives of the programmatic are to identify, prioritize and implement habitat restoration actions in the Tucannon River which would improve spring Chinook habitat by 17% over the time of the 2008 FCRPS Biological Opinion. The SRSRB manages the programmatic by working with its local partners developed through the SRFB supported Regional Organization including; the Columbia Conservation District (CCD), Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Nez Perce Tribe (NPT), Pomeroy Conservation District (PCD), Tri-State Steelheaders (TSS), Umatilla National Forest Pomeroy District (USFS), Washington Department of Fish and Wildlife (WDFW), Washington State Parks Wooten State Park. The partners provide technical support in the development of restoration priorities, identify restoration projects that best meet the priorities and prioritize those projects for the 1.3 million dollars annually available to the programmatic. To coordinate and manage the activities related to project management and implementation the SRSRB receives a contract from the programmatic annually. The purpose of this annual report is to describe the work completed using the project management contract.

During the performance period the SRSRB coordinated the monthly meetings of the Regional Technical Team (RTT) the Tucannon Coordination Committee (TCC), and provided updates to the SRSRB governing body. The RTT and the TCC are the technical group responsible for project prioritization and technical review and is the technical support for the SRSRB. It is through these technical groups the SRSRB reviewed and approved the Tucannon Geomorphic Assessment (Anchor April, 2011) and the Conceptual Restoration Plan, Reaches 6 to 10 Tucannon River Phase II (November 2011). These documents were developed to be used as a guide in the prioritization of restoration projects into the Tucannon Work Plan. The SRSRB implemented the development of several sub contracts to implement restoration actions, collect monitoring data, acquire restoration materials, and advance restoration designs. The SRSRB conducts annual tours of restoration projects in the basin and offers technical guidance in the pursuit of matching funding for restoration in the Tucannon.

Area of Primary Focus:

The Tucannon River is a Snake River tributary originating in the Blue Mountains of southeast Washington (Figure 1) and is located in Columbia and Garfield Counties. The main channel is approximately 58 miles long and drains about 503 square miles before entering the Snake River approximately 3 mile upstream from Lower Monumental Dam. Several major tributaries drain into the

mainstem including, Pataha Creek, Tumalum Creek, Cummins Creek, Little Tucannon, and Panjab Creek. A full description of the basin has been provided in the Tucannon River Geomorphic Assessment and Habitat Restoration Study (Anchor April, 2011).

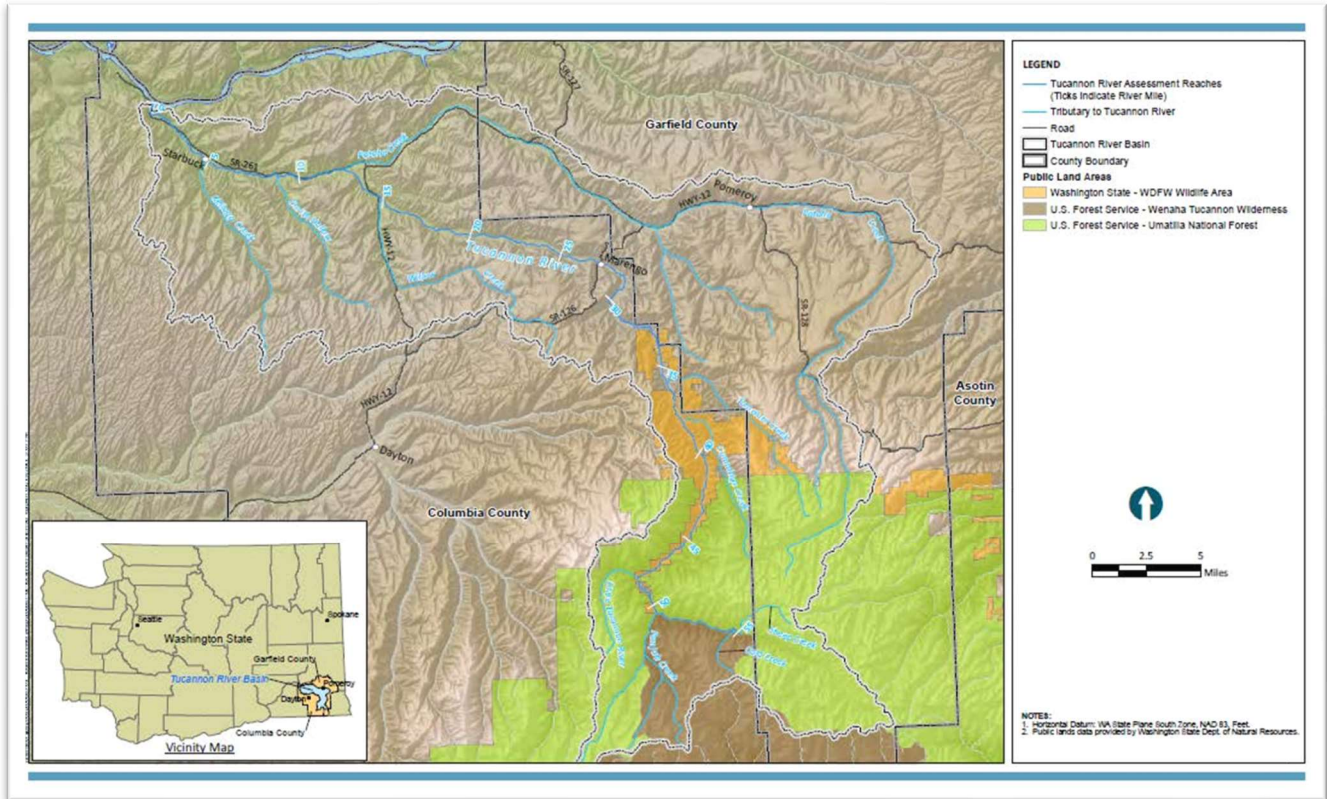


Figure 1. Tucannon River Watershed vicinity map (Anchor April, 2011). The gold shaded areas indicate the Wooten Wildlife Area, the green areas the Umatilla National Forest, the darker brown headwaters of the Tucannon indicate the wilderness area and the remainder of the watershed is private land.

Focal Species

The Tucannon supports populations of four threatened species including the Snake River ESU spring Chinook, Snake River fall Chinook, Snake River ESU summer steelhead, and the Columbia River bull trout. All reaches of the Tucannon River are utilized by all species during one or more seasons annually. The lower Snake River spring Chinook is currently only present in the Tucannon having been extirpated from Asotin Creek (Figure 2).

The Tucannon River spring Chinook is a sub-population of the Snake River spring Chinook ESU which has been listed as threatened under the Endangered Species Act since 1996 and is the primary focus of the programmatic restoration project. The Tucannon River is the lowest downstream tributary population in the Snake River and is also the lowest elevation drainage where Snake River spring Chinook exist, in the Snake River. The population was in decline throughout the 80’s, but reached a

critical low in the mid 90's when the number of wild adults dipped to as few as three natural produced individuals. The current know distribution for spawning and rearing spring Chinook in the Tucannon is from RM 20 upstream to RM 50 based on available information (Figure 2). The project reach identified for restoration action under the programmatic is based on the known spawning and rearing areas of historic and current populations. Restoration focusing on projects increasing channel complexity and floodplain connectivity from RM 20-50 (Figure 3) will receive first priority for implementation funding under the programmatic, however project focusing on steelhead habitat restoration drainage wide, will remain a high priority for funding from sources other than the programmatic.

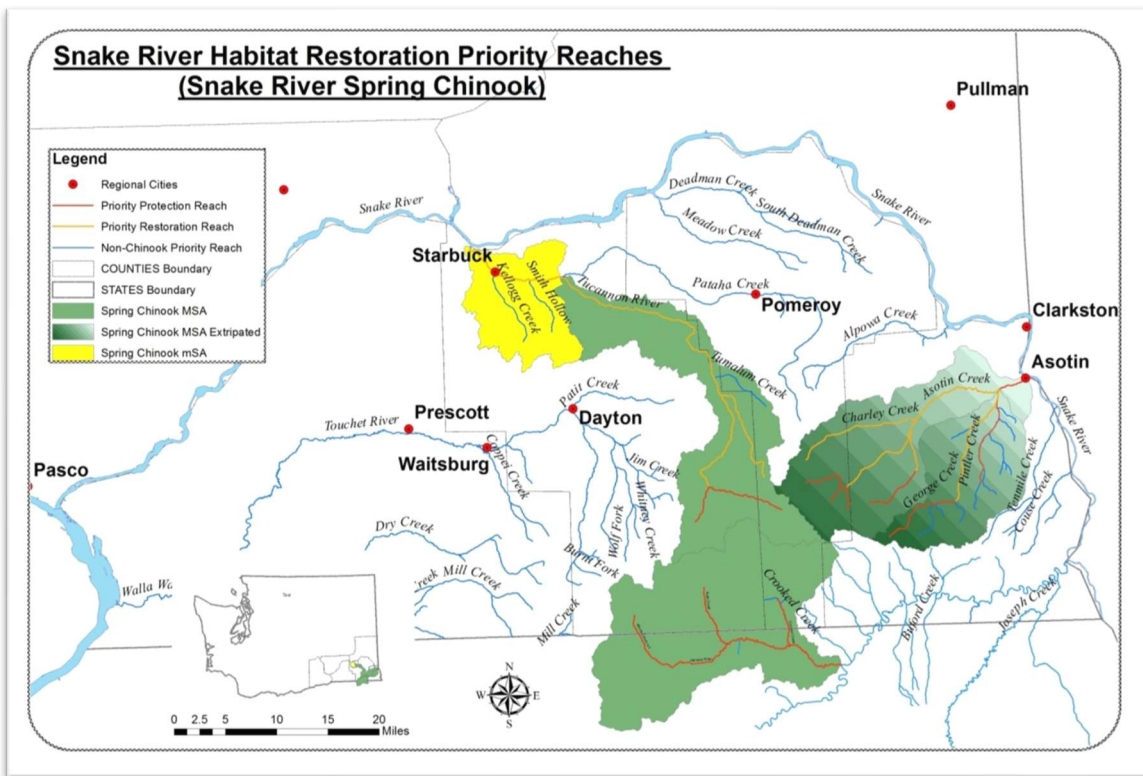


Figure 2. Snake River Salmon Recovery Plan priority areas for Snake River ESU spring Chinook. The map highlights the Tucannon, Asotin and Wenaha River basins. The green shaded areas are the major spawning areas (MSA) and the yellow area is a minor spawning area (mSA). The stream reach highlighted orange indicate the river reach where the SRSRB RTT supports stream channel restoration activities and the red reach protection type projects. The Asotin population is currently believed to have been extirpated.

The SRSRB and its partners have been working to improve Tucannon River spring Chinook productivity and survival in the Tucannon River by focusing on habitat restoration actions which directly or indirectly impact habitat factors identified as factors limiting Chinook productivity and survival. Limiting factors were identified through EDT analysis conducted in the development of the Salmon Recovery Plan for South East Washington, the 2008 FCRPS Biological Opinion and are also listed in Table 1.

Table 1: Habitat restoration objectives as they are list in the Salmon Recovery Plan for South Eastern Washington for the Tucannon River from the mouth of Pataha Creek upstream above Panjab Cr. The objectives are listed by level of priority as identified in the 2012 plan. Imminent threats are always considered the highest priority when identified in project rounds.

Upper Tucannon River MSA (from Pataha Creek upstream to Tucannon headwaters)	
Imminent Threats: Fish Screens, Low Stream Flows	
I.	Riparian: > 40 to 75% of maximum
II.	Large Woody Debris: >1 key piece per channel width
III.	Channel Confinement: < 25 to 50% of stream bank length
IV.	Temperature: < 4 days > 72°F

Salmon habitat restoration began in the Tucannon as early as 1999 and considerable progress has been made in addressing imminent threats (fish passage, irrigation screening & low flow), restoring and protecting riparian habitat and implementing upland BMPs like no-till agriculture (Table 2). Through the implementation of the restoration actions, improvements in summer temperature, reduced embeddedness and increasing woody debris are being realized, though it will take decades before full benefits of some actions are fully realized.

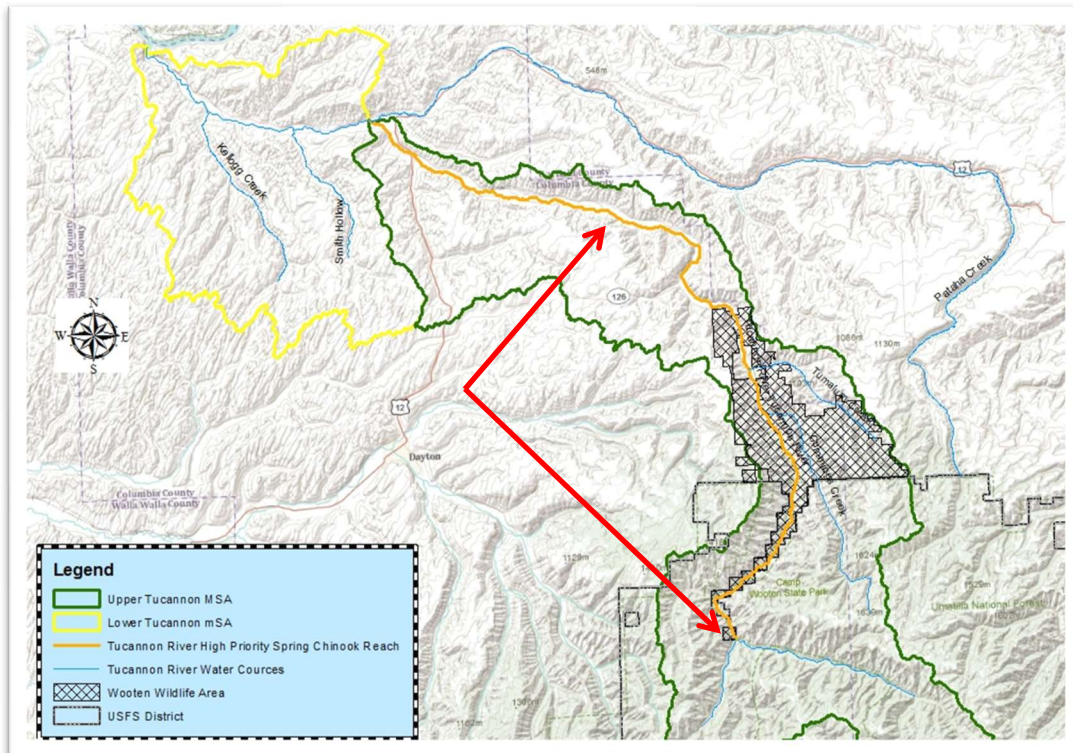


Figure 3. The Tucannon River spring Chinook priority restoration area is the river reach highlighted in orange and indicated by the red arrows. The Tucannon major spawning area is represented by the green polygon and the minor spawning area by the yellow polygon. See legend for additional map detail.

The RTT has considered the restoration achievements in imminent threats, riparian planting and upland BMPs and through adaptive management has narrowed the restoration focus to restoring rearing habitat as the primary objective for Chinook recovery in the Tucannon.

Table 2. The Tucannon River habitat restoration objectives for salmon and steelhead as identified in the 2012 Salmon Recovery Plan for SE Washington. Each objective has several habitat metrics being used to measure progress towards meeting the restoration objective. The table lists the total available/current know habitat, the restoration goal of the objective and the current status toward meeting the goal.

Restoration Objective	Metric Description	Metric	Units
Riparian Restoration Objective – Restore to >40 to 75% of maximum	Reach Length	51	miles
	Length Public Lands (24%)	12.34	miles
	Restoration Goal Length	29-54	miles
	Current Status	33.85	miles
	Total Reach Area at 180 ft Buffer	2618	acres
	Area Planted Goal	1963.5	acres
	Restoration Status	1008.6	acres
Remove All Imminent Threats (Migration Barriers, Unscreened Diversions)	Screen Estimated Total	60	count
	Screen Status	54	count
	Barrier Estimated Total	5	count
	Barrier Status	5	count
Large Woody Debris Restore to > 1 Key Piece per Channel Width	Reach Length (reach 6-10)	30	miles
	LWD Restoration Goal	21	miles
	LWD Restoration Status	2.5	miles
	LWD Goal # of Key Pieces (50 ft average bank width)	2218	count
	LWD Status # of Key Pieces	511	count
Channel Confinement: Restore to < 25 to 50% of Bank Length	Reach 6-10 Total Length	30	miles
	Reach 6-10 Goal Length	18	miles
	Reach 2-5 Total Length	20	miles
	Reach 2-5 Goal Length	5	miles

Rearing habitat was a major factor in the development of the Tucannon River Geomorphic Assessment and Habitat Restoration Study (Anchor April, 2011) which lead to the project objectives in the Conceptual Restoration Plan, Reaches 6 to 10 Tucannon River Phase II (Anchor November, 2011). Considering the tiered project list produced in Anchor November, 2011 the SRSRB TCC and RTT worked with project sponsors to prioritized implementation funding to restoration projects in a long term work plan spanning the life of the programmatic (Attached in Pisces to Contract # 52633).

Larger restoration project in areas where infrastructure is present requires a higher level of assessment, coordination and design leading to a greater need for habitat data. Data gaps exist in the Tucannon including pre-smolt Chinook migration and survival, adult mortality for returning from the ocean passing the Tucannon and adults bypassing the adult trap which has led to concerns about the effectiveness of the trap and whether it is begging to produce a shift in distribution or survival. To answer these uncertainties the SRSRB will continue to work in the watershed to guide monitoring and identify factors limiting survival by supporting our partners in generating and using the best available science.

The restoration objectives outlined in Anchor November 2012 focus on reducing channel confinement, increasing floodplain connectivity and increasing channel complexity by placing large wood debris. By targeting river function over large reaches the SRSRB anticipates the river to express itself in the development of new channels, side channels and other critical off channel habitats limiting Chinook rearing survival. As channel shape changes from the existing over straightened incised single thread channel to a longer anabranch system, hyporheic exchange will improve increasing groundwater influence, cooling summer base flows and warming winter base flows. Improvements in floodplain connectivity will enhance riparian forests by depositing fines on the floodplain reducing embeddedness, increasing water retention and overtime leading to increased forest sustainability and LWD recruitment.

Implementation Approach:

In 2012, the SRSRB worked in support of its project sponsors to coordinate technical meetings, prioritize projects, and create a 6 Year Work Plan. The SRSRB managed the development of restoration designs, and coordinated several sub contracts in project implementation and data collection. The SRSRB developed outreach materials and attended public meeting describing the goals and objectives of the Programmatic. SRSRB staff provided a supportive role in the implementation or restoration projects and aided in securing building materials.

The following sections of this report will provide a detailed description of activities conducted under the work elements outlined in the scope of work (contract number 56233). When applicable, methods, results and progress on deliverables are described for the time period from February 1, 2012 through January 31, 2013.

Work Element Method and Result Deliverable Reporting

Program Implementation

Work Element 119, 185, 132: Manage and Administer Project, Produce Status Reports & Annual Report:

Deliverables: 2013 SOW development, property inventory, submitted in Pisces. Coordinate the Tucannon River Programmatic and identify project matching funds. Complete periodic status reports and annual report.

During the time period February 1, 2012 through January 31, 2013 the SRSRB managed the implementation of the Programmatic (contract: 56233) and was the point of contact from its office at 410 B East Main Street, Dayton, Washington 99328. The SRSRB coordinated monthly RTT meetings on the 3rd Tuesday of each month for the purpose of prioritizing restoration actions, set restoration goals and objectives and reviewing restoration designs. The SRSRB and RTT maintained the TCC, a group of project sponsors and resource experts locally involved in Tucannon River habitat restoration. The TCC is a subcommittee of the RTT with the purpose of identifying restoration activities which best meet the restoration objective (Table 1) and coordinating those activities over the duration of the Programmatic. The TCC meets on a monthly basis with the objective of streamline restoration and monitoring efforts. The participants of the TCC included representation from the, US Forest Service (USFS), Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Nez Pierce Tribe (NPT), Washington Department of Fish and Wildlife (WDFW), Columbia Conservation District (CCD), Pomeroy Conservation District (PCD), Tri-State Steelheaders (TSS) and SRSRB.

The Programmatic supported the CCD's development of the Tucannon River Geomorphic Assessment and Habitat Restoration Study (Anchor April, 2011), and Conceptual Restoration Plan, Reaches 6 to 10 Tucannon River Phase II (Anchor April, 2012) and prioritized the 28 projects identified into a 6 year work plan (Attached to Pisces contract # 56233). The TCC and the RTT prioritize the 28 restoration projects identified in the Conceptual Restoration Plan (Anchor November, 2011) for available funding and estimated and identified matching funding from non-BPA sources over the first three years of the plan.

Implementation began on the programmatic in 2012 with two projects being competed, including Project Area 10 complexity and confinement project and the Project Area 18 floodplain project. The SRSRB supported the implementation of PA 10 by providing technical review and a sub contract to WDFW to provide project management. The SRSRB also provided field support during pre/post-project monitoring and construction. Project 18 received technical review from the TCC/RTT and was supported under the WDFW project management sub contract. Project Area 10 & 18 were completed using FY 2011 programmatic funding matched with SRFB funds acquired in 2010 and 2011.

Implementation of PA 10 utilized a combination of constructed engineered log jams and unsecured log complexes. The unsecured logs were made available as match through the USFS and totaled 291 whole trees ranging in length from 50 feet in length to over 100 feet and ranged in diameter from 15 inches to over 30 inches. Many of the trees were placed in stream for the purpose of forcing pools or side channels. The stability of structures in the system is reliant on the size of trees placed; size was determined using the WDFW SHRUG guidelines developed in the Stream Restoration Manual. Trees were stacked in many locations to provide ballast to aid in the stability

Trees were transported (291 total) from the US National Forest approximately 3-6 miles to the project area and were placed in stream using a S64 Sky Crane helicopter. Approximately 500 additional trees were transported to the project site ranging in size from 4-12 inches in diameter and 20-30 feet long and distributed throughout the project reach using the helicopter. These trees were placed to act as racking materials to the larger trees. The project reach treated in 2012 (PA-12) was mostly devoid of LWD prior to the LWD replenishment portion of the project as is illustrated in figure 5.



Figure 5: Tucannon River Project Area 10 April 2010 pre project photo of sample reach to be treated with LWD augmentation. Existing condition in this reach exhibited plain bed channel with almost no existing LWD Key pieces.

Providing additional information and added benefit to PA 10 restoration efforts high resolution aerial photos were collected by USDA for the entire Tucannon River on September 6, 2012 just 6 days after construction was completed on the project. The images illustrate the extent to which this project increased LWD in the channel and on the floodplain (Figure 6). For more information on project PA 10 design and implementation go to the Tucannon River Large Wood Restoration Project Area 10 Final Report produced by WDFW 2012 Programmatic contract 54636.

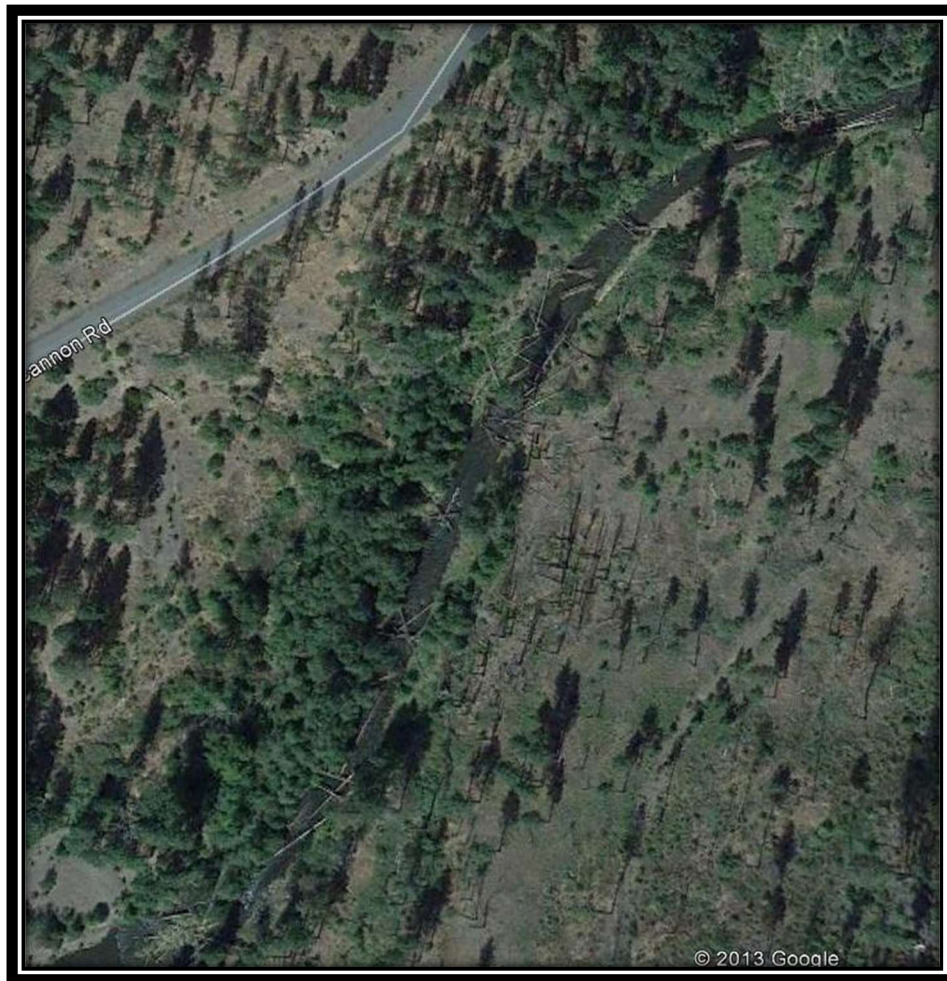


Figure 6: Tucannon River Project Area 10 Sept 6, 2012 post project photo of sample reach illustrated in figure 5 treated with LWD by helicopter. The photo was taken by NRCS just days after implementation of this project and images are available on Google Earth or other providers. Note the number of whole trees and debris placed in the channel and on the floodplain.

Work was also completed on PA 18 in August 2012, with the removal of buildings, wells and an old culvert located on the floodplain (Figure 7). This project was completed to provide full floodplain connectivity to the existing flood plain where improvement in floodplain connectivity were brought about by past restoration activities. During over bank flow events in 2008-2010 conditions near the

WDFW owned and managed infrastructure began to change creating favorable conditions for salmonids which also increased risk to buildings and a pair of wells on the wildlife refuge (Figure 7).

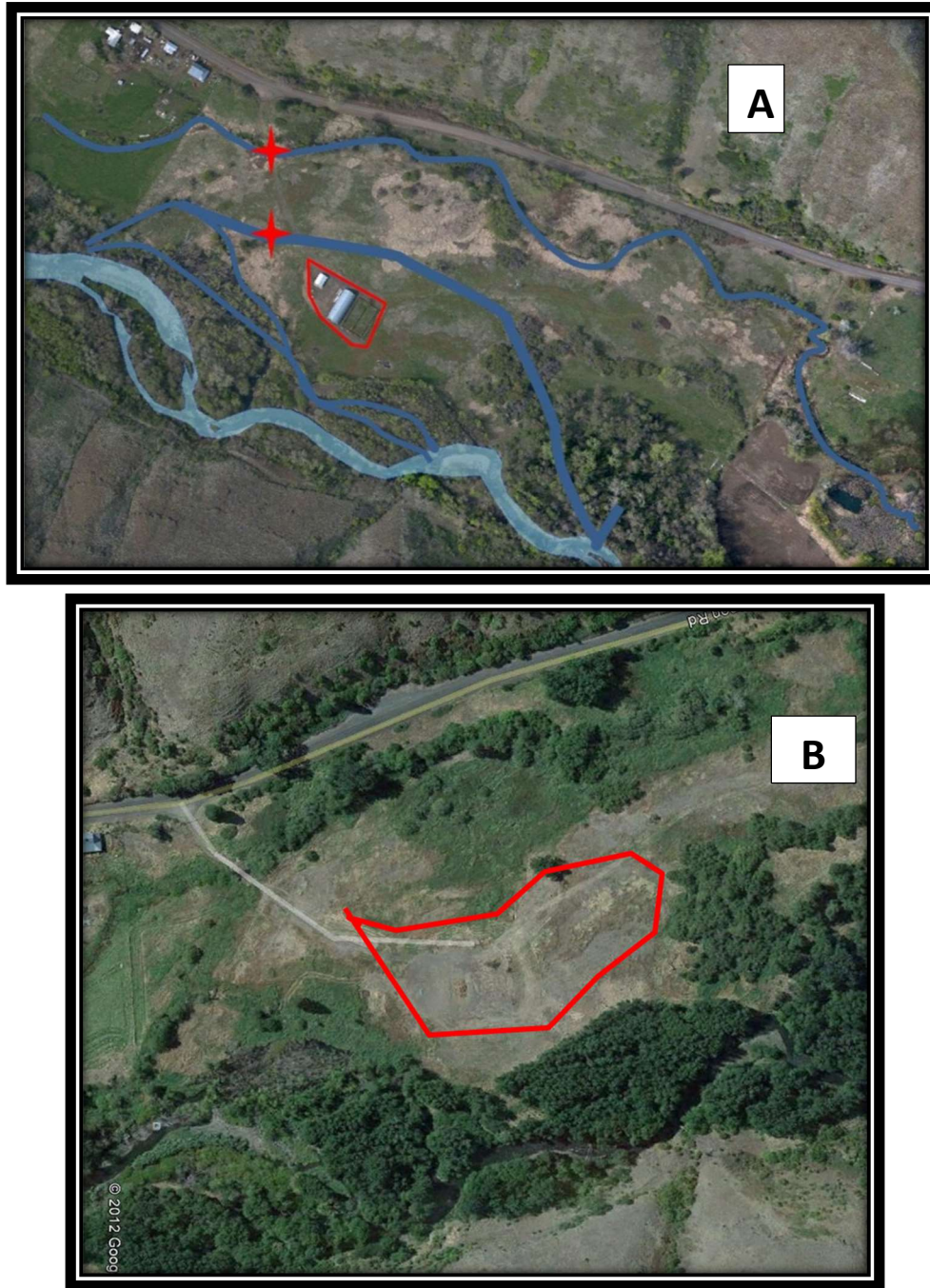


Figure 7. Project Area 18 floodplain restoration project. Image A illustrates the pre project condition. The blue lines on the image indicate the over land flows which occurred in 2009 and 2010. The red polygon highlights the infrastructure removed as part of this project. Image B illustrates the post project condition of the site in September 2012. The red polygon indicates the position of the removed infrastructure.

Discussions in the TCC and RTT determined that it would be preferential to allow these conditions to continue to develop and that WDFW consider moving the buildings and decommission the wells. It was determined by WDFW that it would best suit wildlife and natural process on the wildlife area to remove the buildings and decommission the wells and WDFW would at its own expense replace the building in a better location.

SRSRB staff aided in the development of project designs through acquiring and implementing a SRFB salmon grant to develop final designs preliminary designs on PA 14, PA 15 and PA 24. It is anticipated that PA 14 will be implemented in 2013 by WDFW. The SRSRB also managed a contract to advance PA 15 to a final design for implementation in 2014. It is anticipated PA 24 will be finalized in upcoming years for implementation. The SRFB has been reported as match to the Programmatic in 2012.

Project 14

The 30 % Design Report Project Area 14 Tucannon River Phase II (Anchor 2012c) produced for the CCD, was identified in 2012 for implementation in 2013 and through a matching grant obtained by SRSRB, was completed to a 100% level final design in January 2013. Project Area 14 was selected based on its ranking as a tier 1 project in the Conceptual Restoration Plan (Anchor November 2012) and that it was ready for early implementation due to design funding through the CCD and SRSRB. Final designs were reviewed by the TCC and RTT before they were recommended for FY 2012 funding under the programmatic. PA 14 will be completed on WDFW property beginning at RM 37.7 upstream to RM 39.2 and will focus on the construction of engineered log jams for the purpose of modifying channel form. The target channel objectives are to reduce channel incision, increase complexity, increase floodplain connectivity and increase off channel habitat. Final project designs were completed in January 2013 and are attached to the contract numbered 58777. The SRSRB supported work complete toward this project by managing the SRFB design grant and providing technical review and oversight including field visits with WDFW and Anchor throughout the design process.

Project 15

In 2012, the SRSRB utilized a SRFB grant to develop the conceptual design prepared for Project Area 15 by Anchor QEA (Anchor November 2012) into a 30% preliminary design. Project Area 15 was selected for preliminary design because it was identified as a Tier 1 project (Anchor November 2012) and because of its proximity to the construction on PA 14. The designing process was completed in July 2012, and was followed by the development of a contract under the programmatic which will advance the design level from preliminary to final by the summer of 2013. The project has been recommended for implementation in 2014 and would involve the placement of river channel structure between RM 36.35 and RM 37.15. Draft 30% designs are attached to the contract numbered 58975 in Pisces.

Project 24

The PA 24 30% designs were also developed in 2012 under the SRSRB SRFB grant from conceptual design prepared by Anchor November ,2011 into a 30% preliminary design. The project is scheduled for implementation in 2014-2015 and would involve the removal of river confining structure and the placement of channel complexity. Once the implementation date is finalized final designs for this project will be completed. The project designs are attached to contract 56233 in Pisces.

Program Guidance and Create Project List

Work Element 114: Identify and Select Projects:

Deliverable: Conduct project solicitation and prioritize projects based on their merit and benefit to salmon recovery. Submit recommended projects to BPA. Provide technical support to project sponsors throughout implementation.

The SRSRB developed an approach to project selection and prioritization that differs from the conventional approach where organizations solicit projects and then review, revise, score, and rank them. In 2012, we utilized a targeted approach in, where the projects are pre-identified based on a basin-scale geomorphic study (Anchor November, 2011), watershed restoration strategy and project prioritization framework. The geomorphic assessment, restoration strategy and project prioritization efforts were conducted by Anchor QEA (Anchor April, 2011 and November 2011). The November 2011 study developed the process and criteria that was used in the 2012 project solicitation and will be used to prioritize future projects and outlined a comprehensive restoration strategy. .

The April 2011 study was conducted to strengthen the technical understanding of existing physical conditions and geomorphic processes in the basin from the mouth to the headwaters in order to identify and prioritize habitat restoration opportunities based on current empirical data. The assessment included: identification of the source, magnitude, and distribution of hydrologic and sediment inputs through the basin; analysis of floodplain connectivity; identification of passage barriers or infrastructure constraints; identification of stressors and features leading to habitat degradation; and a qualitative evaluation of restoration opportunities. A more focused and intense assessment was then conducted within the spawning and summer rearing distribution of spring Chinook salmon (river mile 20 to river mile 50) by Anchor QEA (November 2011). That assessment and subsequent reports form the technical basis for the projects proposed in this habitat programmatic.

The November 2011 (Anchor November 2011) report provided the conceptual restoration plans for discrete project areas between RM 20 and RM 50. Twenty-eight conceptual project areas were delineated and evaluated for restoration and protection potential. Project evaluation was based on findings in the 2011 Geomorphic Assessment (Anchor April, 2011); field reconnaissance during

summer 2011 that characterized channel, floodplain, and riparian conditions; existing spring Chinook spawning and juvenile rearing data; input from the Tucannon Coordination Committee and RTT. The 28 conceptual project areas were then prioritized and placed into one of three Tiers. The project evaluation criteria were (1) expected biologic response, (2) consistency with natural geomorphic process, and (3) benefit-to-cost ratio. Biologic and geomorphic criteria were assigned qualitative values of high, moderate, or low value and benefit-to-cost was given a qualitative ratio using high, moderate, or low values.

The expected biological benefit was scored based on the expected magnitude of benefits and the likelihood that project objectives would be met. Those projects that most directly address limiting factors and critical life stages, while creating the greatest volume and diversity of quantifiable habitat, received the highest scoring. The juvenile spring Chinook life history stage (egg to parr) was identified as critical to improving the spring Chinook population in the Tucannon River. In particular, the persistent lack of adequate juvenile rearing habitat, especially during winter and spring runoff (post-emergence to parr), bed scour during stochastic winter/spring flows, and summer water temperature have been identified as limiting to juvenile populations. The expected biologic response of each project was evaluated within the following categories (1) provides immediate habitat benefits for critical life history stages, (2) reconnects isolated habitats or improves existing habitats and promotes floodplain connectivity, and (3) provides diversity throughout the active channel and low-lying floodplain for all life history stages.

The consistency with natural geomorphic process criteria was also used. Natural geomorphic processes are the primary factor in creating and maintaining high quality habitat in properly functioning rivers and streams. Designing for geomorphic process or removing inhibitors to geomorphic processes are very important considerations in project prioritization. The sustainability and functionality of the project is highly dependent on consistency with geomorphic processes, and it is the restoration of these processes that will create and maintain habitat features in the long term. The projects that will effectively address the rehabilitation of natural processes received the highest qualitative rating. Consistency with natural geomorphic processes were evaluated within the following categories (1) removes stressors that promote habitat degradation or inhibit natural channel and floodplain processes, (2) promotes reach-scale geomorphic response consistent with natural processes, (3) promotes the retention of LWD and sediment and forces pool-riffle morphology and complex channel plan form.

A rough opinion of probable cost for each project was developed by Anchor (November, 2011). The result of that evaluation was a qualitative ranking of the benefit-to-cost ratio. Those projects that achieve the greatest benefit for the least amount of money received the highest ratings. This criterion also considered whether the benefit is achieved on a short-term or a long-term time line. This evaluation did not consider feasibility in terms of landowner willingness to participate, which is a consideration the RTT and TCC determined in the development of the work plan (Attached in Pisces contract # 56233). About fifty-percent of the river's length between river mile 20 and river mile 50 is privately owned while

the remainder is state or federally owned. For a complete description and analysis of each project area refer to Anchor QEA (November 2011). Based on the results of the evaluation, the 28 project areas were organized into Tiers 1, 2 and 3, with Tier 1 projects being the highest priority for early implementation.

Project sponsorship is agreed to by TCC members at the conceptual project phase, i.e., SRSRB staff provide the list of priority projects and then TCC members assess their interest in sponsoring a project based on a member's interest, history, knowledge and/or capacity. A conceptual project at that point has a "likely lead" and is added to the work plan. The work plan (Attached to Pisces contract number 56233) identifies the 28 projects, likely lead, draft budget and a likely implementation year. This work plan allows the TCC and others to understand project sequencing, know who the point of contact is, what the anticipated annual budget will be, which projects have or will seek cost share and allow for tracking and reporting of completed projects.

Develop Effectiveness Monitoring Plan

Work Element 156: Develop RM&E Methods and Designs

Deliverable: Development of a monitoring plan

The SRSRB staff worked to update the habitat monitoring plan drafted in 2011, for the purpose of defining and guiding monitoring activities in the Tucannon River. Due to the complexities in the development of the plan the SRSRB solicited the support of Ecologic Inc. to provide technical input in the finalization of the plan. Though this effort will aid in the completion of the plan it is not certain if the plan will be finalized at the time of the completion of this report. The SRSRB will continue to work with its partners to finalize a draft plan in 2013 but for now will use the provisional plan. The provisional draft is available at the SRSRB office but will not be made publicly available until it is completed and had RTT review.

The objective of the plan is to organize and outline a strategy for the SRSRB and its partners to observe long term trends in the habitat parameters identified as the limiting factors to salmon recovery. The environmental parameters identified as measuring progress toward the limiting factors are identified in Appendix 1. The SRSRB as a habitat restoration program, has not traditionally collected or maintained environmental data sets for the purpose of reporting habitat conditions in the Tucannon, but has relied on its partners and the resource agencies to collect validate and maintain monitoring datasets. The reliance of the SRSRB on partners to collect the necessary data for adaptive management, in some cases has led to gaps in the data necessary to making informed management decisions. The plan will identify data gaps and will describe the nature of the data needed. The current known data gaps are identified in Appendix 1 as well as existing data (duration and replication). Opportunities for filling the gaps will be outlined in the monitoring plan including the methods used to collect the data.

Effectiveness Monitoring

Work Element 157: Collect/Generate/Validate Field and Lab Data

During the time period February 1, 2012 through January 31, 2013 the SRSRB coordinated and supported its partners in the collection of datasets including stream temperature, flow and channel complexity. The SRSRB adopted the CHaMP method and protocol for implementation monitoring so the changes made through restoration could be directly compared to the watershed wide scale changes. During the development of CHaMP protocol in the Tucannon the SRSRB coordinated with the program to pair treatment and control sites to restoration priorities. Even with coordination very few restoration site would be sampled and it was feared by the RTT that the CHaMP program at the scale it was monitoring would not capture improvements. In 2012, 3 additional CHaMP sites were conducted through supported by the programmatic in relation to future implementation projects (PA 03, 14 and 24) for the purpose of developing pre-project base line. The data was collected by Ecologic Inc, the CHaMP contractor conducting the Tucannon CHaMP project. As part of our contract with Ecologic they will process, analyze and remain the stewards of the data set.

The SRSRB worked with its partners to ensure the long term datasets on stream flow and temperature where continued in 2012, primarily through coordination with WDOE to maintain the stream flow and temperature gage at Marengo. Gages all over the region have been at risk for discontinuation under WDOE funding and the SRSRB will need to remain proactive to ensure this data set continues.

In 2012, stream flow (Figure 8) and temperature (Figure 9) was monitored continuously at the DOE Marengo gage while only flow (Figure 10) was monitored at the USGS Starbuck gage.

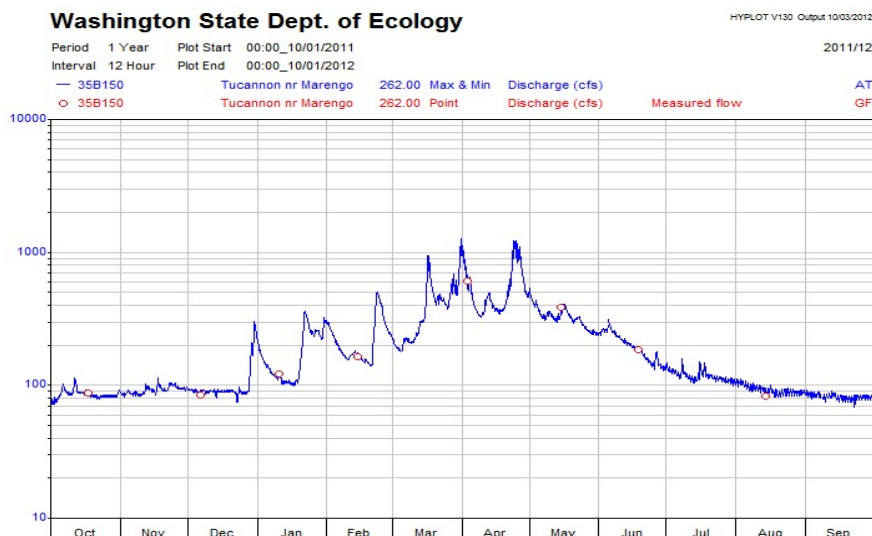


Figure 8. Stream flow measured at the WDOE stream gage at Marengo for the 2012 water year beginning October 1st 2011 through September 31st 2012. Flow is reported as daily mean for cfs.

Washington State Dept. of Ecology

HYPLOT V130 Output 01/16/2013

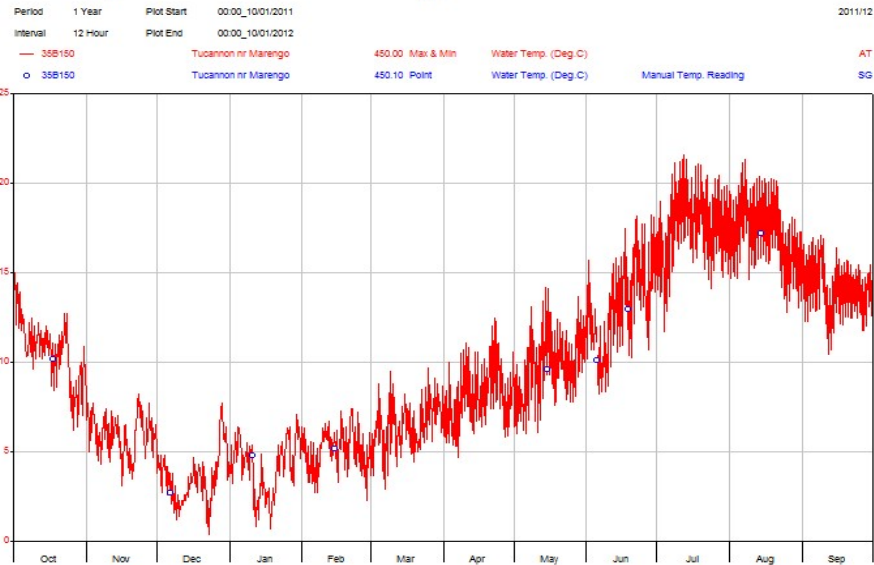


Figure 9. Stream temperature measured at the WDOE stream gage at Marengo for the 2012 water year beginning October 1st 2011 through September 31st 2012. Temperature is reported as daily mean in degrees Celsius.

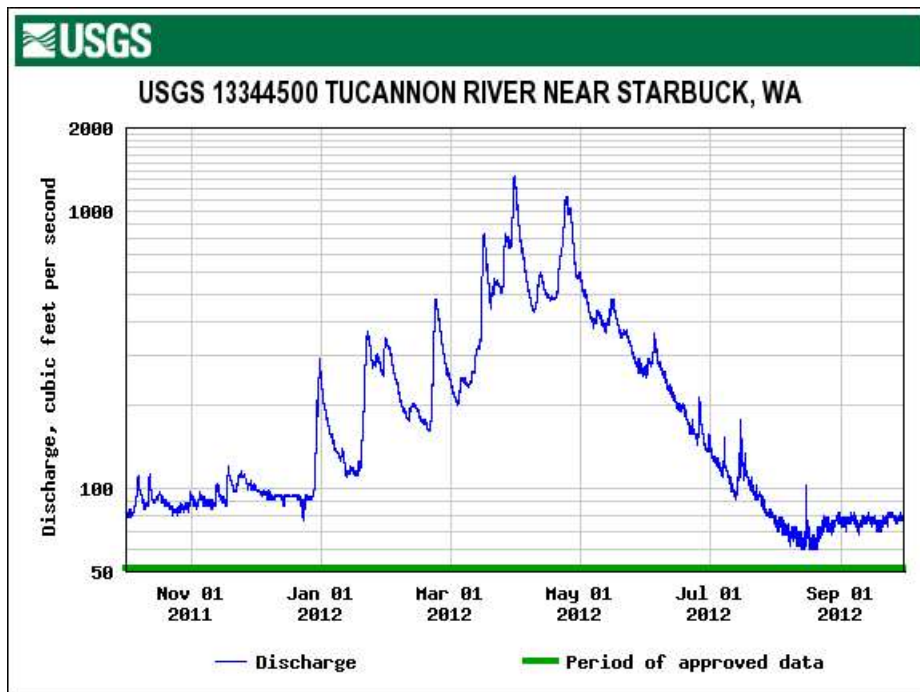


Figure 10. Stream flow measured at the USGS stream gage near Starbuck for the 2012 water year beginning October 1st 2011 through September 31st 2012. Flow is reported as daily mean for cfs.

Stream flow at the Marengo and Starbuck gage for the 2012 water year are displayed in Figure 8 & 10 for the time period October 1, 2011 through September 30th 2012. . Daily mean flow during the critical seasonally hot months of June, July, August and September did not recede below 77 cfs at the Marengo gage, however the instantaneous minimum flow did recede to 69 cfs on September 22nd and momentarily dipped below 77 cfs on Sept 9th and the 15th through the 22nd. Flow at the Starbuck gage dipped below the minimum flow objective of 77 cfs in the months of August and September (Figure 10).

Stream temperature was monitored in 2012 at the WDOE stream gage located at Marengo and original data can be obtained at <https://fortress.wa.gov/ecy/wrx/wrx/flows/station.asp?sta=35P050> . Stream temperature is presented as daily mean temperature (°C) (Figure 9). During the reporting period the instantaneous high temperatures did not exceed 21.6°C/70.9°F, which is below the restoration objective of < 72°F set in the recovery plan. Stream temperature data collected at the WDOE Marengo stream gage has been binned into three year brackets and plotted to illustrate variation in stream temperature for the time period beginning in 2003 through 2011. An additional time period was extracted from the WDFW Tucannon River Temperature Study (2003 WDFW). The results of these plots can be viewed in Figure 11. At the moment the SRSRB is not extracting inference from this plot but will continue to review the available data to identify trends in stream temperature over time.

In April 2010, the CCD acquired a LIDAR and orthographic image data set for the Tucannon River valley floor from its confluence with the Snake River upstream to RM 60. The LIDAR dataset was used to determine area of connected and disconnected low-lying floodplain, potential side channels and riparian enhancement opportunities for RM 20 to RM 50, data is provided in Anchor (November 2011, Table 3). River channel confinement in the Tucannon River was found to be approximately 80% (40 miles) of the total 50 miles surveyed as part of the Tucannon River Assessment (Anchor April 2011). The Tucannon River has been impacted by confinement greater than was initially estimated from earlier available data. The restoration objectives outlined in the restoration plan (Table 1) recommend reducing channel confinement to a maximum of 25%-50% confined. When the maximum confinement range is applied to the data provided in Anchor (November 2011 (Table 4) the restoration goal for confinement equals 23.1 miles of habitat restoration needed to reach 75% unconfined.

In 2012, Project Area 10 restoration actions were completed to reduce river channel confinement over approximately 1.5 miles of stream. Pre-project data indicates river channel confinement through the reach to be moderately confined for the entire 1.5 miles. In December 2012 high flows activated a side channel increasing channel length by approximately a 0.5 mile. Follow up monitoring in the summer of 2013 will provided better information into the overall increases in floodplain connectivity.

Additionally, in 2010 the CCD completed the river levee set back project on approximately 3 miles of Project Area 26. Though the initial set back removed river levee back from the stream bank the full

expression of the floodplain continues to evolve and in 2013 the CCD intends to design and implement LWD additional in the reach to encourage river meander.

Table 3. This table is reproduced from Anchor 2011b and lists the approximate habitat quantities for restoration projects produced during the conceptual restoration plan. The table list the restoration actions for reaches 6-10 of the restoration .

Reach	Project Area	RM		Project Actions (in ft)								Reconnected Low Floodplain (in acres)	Riparian Enhancement (in acres)	Protection Area (RM)
				LWD Addition	Levees/Riprap		Side Channels			Roads				
		From	To		Removal	Set Back	Enhance	New	Reconnect	Remove	Realign			
10	1	50.0	48.9	6714	-	-	-	-	-	-	-	-	-	-
	2	49.1	48.7	1097	-	-	1412	203	-	-	-	-	-	-
	3	48.7	46.8	6908	377	-	-	-	-	-	-	0.59	-	-
	4	46.8	46.4	2386	1191	1028.47*	1969	256	822	-	-	1.63	-	-
	5	46.4	46.0	2460	988	95	-	-	-	2327	-	10.73	-	-
	6	46.0	45.3	1134	145	-	-	-	-	-	-	-	-	45.3-45.7
	7	45.3	44.9	2443	337	-	-	-	-	2706	2468	-	-	-
	8	44.9	44.4	1504	684	329	445	-	546	-	-	1.01	-	-
	9	44.4	44.0	2970	2563	-	-	-	-	-	-	-	-	-
9	10	44.0	42.4	8174	1305	-	-	-	-	-	5.83	39.37	-	
	11	42.3	40.7	9716	1108	-	-	-	-	1540	652	1.43	39.79	-
	12	40.7	40.0	1965	-	-	-	-	-	-	-	-	17.81	40.0-40.7
8	13	40.0	39.2	3556	3192	759	-	-	-	-	3.91	-	-	-
	14	39.2	37.2	10309	162	-	-	-	-	-	17.77	-	-	-
	15	37.2	36.4	4027	865	-	-	-	-	-	-	-	-	-
	16	36.4	34.9	1708	524	-	-	1118	-	-	-	4.59	-	-
	17	34.9	34.3	2936	706	-	1614	-	-	664	724	2.25	17.26	-
	18	34.3	32.1	3558	-	-	-	-	-	-	-	-	-	33.65-34.3, 32.1-33.1
7	19	32.1	31.8	1432	639	-	-	-	-	-	-	-	-	-
	20	31.8	31.5	-	-	-	-	-	-	-	-	-	-	31.5-31.8
	21	31.5	30.3	5977	1743	2551	-	-	-	-	-	0.59	-	-
	22	30.3	29.3	5338	2945	193	-	-	-	-	-	2.45	-	-
	23	29.3	28.3	5059	2159	889	-	-	-	-	-	9.48	-	-
	24	28.3	27.5	3972	2532	2924	-	-	-	-	-	1.32	-	-
6	25	27.5	26.9	1177	-	-	-	-	-	-	-	-	-	27.15-27.5
	26	26.9	23.7	9578	8305	12218	-	-	-	-	-	29.26	-	-
	27	23.7	22.9	1257	266	2820	-	-	-	-	-	-	-	-
	28	22.9	20.0	1037	657	-	-	-	-	-	-	22.12	-	20.5-21.7, 22.1-22.8

Table 4. The following table lists the data on channel confinement produce from the LIDAR information and is reproduced from Anchor 2011a. The table lists the proportion of river channel confinement by river reach.

Reach	River Mile		Length (mi)	Degree of Confinement, Length (miles)			Degree of Confinement, (%)		
	Begin	End		Confined	Moderate	Unconfined	Confined	Moderate	Unconfined
10	50.2	44.0	6.2	1.5	4.7	0	24.2%	75.8%	0.0%
9	44.0	40.0	4.0	0	2	2	0.0%	50.0%	50.0%
8	40.0	32.1	7.9	0.9	6.4	0.6	11.4%	81.0%	7.6%
7	32.1	27.5	4.6	2.4	2.2	0	52.2%	47.8%	0.0%
6	27.5	20.0	7.5	0.4	5.1	2.1	5.3%	67.1%	27.6%
5	20.0	13.2	6.8	3.7	1.8	1.3	54.4%	26.5%	19.1%
4	13.2	8.9	4.3	0.6	1.9	1.8	14.0%	44.2%	41.9%
3	8.9	4.5	4.4	4.3	0	0.1	97.7%	0.0%	2.3%
2	4.5	0.7	3.8	0.5	1.6	1.7	13.2%	42.1%	44.7%
1	0.7	0.0	0.7	0.7	0	0	100.0%	0.0%	0.0%

			Sums	<i>15</i>	<i>25.7</i>	<i>9.6</i>	<i>29.8%</i>	<i>51.1%</i>	<i>19.1%</i>
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One of the largest data gaps present at the initiation of work on the Tucannon River is instream channel habitat complexity, including channel shape, off channel habitat, and LWD abundance. The assessment work completed under Anchor (April 2011, November 2011) provides information as to available off channel habitat and LWD deficiency though the objective of the assessments was not to collect monitoring data but to describe existing conditions. The CHaMP effectiveness monitoring efforts began in the winter and spring of 2011 and continued in 2012 in coordination with the SRSRB, CHaMP managers were able to consider planned Programmatic restoration actions in designating treatment sites and control monitoring sites. Annually, 25 control and treatment sites will be monitored over the long term with 12 continuous sites and 13 rotating sites. In 2012, the Programmatic supported the completion of 3 additional sites located in association with project areas being design for future implementation to ensure the documentation of pre-project site conditions. CHaMP protocol uses high resolution topographic survey data to develop a DEM for the monitoring reach. The DEM is then used as a measure of channel shape and complexity in which a direct comparison of channel shape can be made over time. Monitoring also measures LWD, substrate type and size, fish cover, bank conditions and riparian cover and condition. Data and data reports are compiled by Ecologic Inc in the Tucannon and is reported at www.champmonitoring.org

Through the work completed in the Tucannon River Assessment (Anchor April, 2011), restoration planning and conceptual design (Anchor November, 2011), the upper 30 miles of river habitat was measured for LWD presence or absence. The river reaches not meeting the LWD objective for restoration of 1 key piece per channel width were noted and a total of 21 miles of the 30 miles surveyed did not meet the objective (Table 1). It is estimated to achieve the restoration objective set for the Tucannon a minimum of 2,200 LWD key pieces will need to be placed throughout the upper 30 miles of river. In 2012, through the implementation of Project Area 10 a total of 300 pieces of LWD were placed on 1.5 miles which meets the LWD objective of >1 piece/bank width. The wood placed on Project Area 10 project totaled 7.14% of the total objective for improving Tucannon large woody debris by length.

Community Involvement and Education'

Work Element 99: Outreach and Education

Deliverable: Conduct one project tour, present program accomplishments to regional agency personnel and LE Board. Develop outreach materials.

The SRSRB conducted outreach activities in 2012 by attending public habitat restoration conferences, coordinating and hosting public tours, posting its completed and planned projects on the Washington State Habitat Work Schedule (<http://hws.ekosystem.us/>) and continues the development of a salmon restoration video clip. Additionally, SRSRB staff attends local public meetings where they lead discussions on the restoration and protection of salmon habitat in the Tucannon. The SRSRB operates highly visible office in downtown Dayton which is highly accessible to the public, providing opportunity for individuals to meet with the SRSRB Director and staff.

In 2012, the SRSRB produced a newsletter highlighting the development of the Tucannon River Programmatic and the projects active and planned in the watershed. The intended audience for the newsletter was the landowners and recreationists of the Tucannon Basin. The letter will be circulated through the mail to landowners and be distributed from local businesses through the spring 2013. Program and project outreach is coordinated by the SRSRB for the purpose of informing both private and public landowners.

The SRSRB works in coordination with WDFW and CTUIR to provide current population data for the Tucannon River spring Chinook, available on the SRSRB website at:

<http://www.snakeriverboard.org/Salmon/WRIA35SprChinook.html>. Population data can be viewed online and is update in the post monitoring season after counts are validated.

The Programmatic participates in the Tucannon River Citizens Work Group through the participation of its WDFW contract and it is through this work group the restoration projects proposed under the Programmatic are presented to the landowners and stakeholders of the watershed.

Transport and Store LWD for Future Project Needs

Work Element 29: Increase Instream Habitat Complexity and Stabilization

Deliverable: LWD protocol and tracking spreadsheet.

Increasingly, large woody debris has been identified as one of the primary objectives for habitat restoration in the Tucannon River. The restoration of the Tucannon River will require the placement of 100s of large trees per year to meet the one key piece per channel width called for in recovery planning. Often the supply and cost of large trees is in flux depending on timing. The SRSRB has had opportunities in the past to acquire large sums of trees with root wads attached at the cost of transport and storage, but did not have a funding mechanism in place to pay for such activities. Through this work element funds were made available for the SRSRB to take advantage of opportunities as they occur through a revolving account for acquisition and transport of wood.

During the 2012 calendar year the SRSRB coordinated the collection and transport of LWD from two sources to be used as part of the Tucannon River Project Area – 10. The pilot project effort worked well for collecting storm fell trees in areas which were easy accessible from the Tucannon River Road. The concept worked well but will not be pursued in 2013 due to current need by sponsors. If it becomes apparent to the SRSRB that the fund is needed again we will pursue it at that time.

Citations

2012 Anchor QEA, LLC. Final 30% Design Report Project Area 15, Tucannon River RM 37.15 to 35.35. Prepared for the Snake River Salmon Recovery Board, Dayton WA. Anchor QEA, Bellingham WA. August 2012.

2012 Anchor QEA, LLC. Final 30% Design Report Project Area 24, Tucannon River RM 28.25 to 27.5. Prepared for the Snake River Salmon Recovery Board, Dayton WA. Anchor QEA, Bellingham WA. August 2012.

2012 Anchor QEA, LLC. Conceptual Restoration Plan, Reaches 3&4 Tucannon River RM 4.5 to 13.4. Prepared for the Columbia Conservation District, Dayton WA. Anchor QEA Bellingham WA October 2012.

2012 Anchor QEA, LLC. Conceptual Restoration Plan, Reach 5 Tucannon River RM 13.4 to 20. Prepared for the Snake River Salmon Recovery Board, Dayton WA. Anchor QEA Bellingham WA October 2012.

2012 Anchor QEA, LLC. 60% Design Report Project Area 14 Tucannon River. Prepared for Snake River Salmon Recovery Board, Dayton WA. Anchor QEA Bellingham WA November 2012

2012 Anchor QEA, LLC. Integrated Species Restoration Prioritization Tucannon River. Prepared for the Columbia Conservation District and Snake River Salmon Recovery Board, Dayton WA. Anchor QEA Bellingham, WA November 2012.

2011 April, Anchor QEA, LLC. Tucannon River Geomorphic Assessment and Habitat Restoration Study. Prepared for Columbia Conservation District, Dayton WA. By Anchor QEA Bellingham WA.

2011 November, Anchor QEA, LLC. Conceptual Restoration Plan, Reach 6 To 10 Tucannon River Phase II. Prepared for Columbia Conservation District, Dayton WA. By Anchor QEA Bellingham WA.

Appendix 1. Tucannon River monitoring parameters and available data produced as part of the Tucannon River Monitoring Plan Outline. The table lists the available data in the Tucannon River indicating the time period and where the data is being housed.

Component	Parameters	Data Source	Time Period	Data Location	Interval	Comments
Hydrology	Flow	1. DOE gage at Marengo, 2. USGS gage at Starbuck	1. 6/1/2003 –present 2. 1997-present	1. SRSRB or WDOE 2. SRSRB or USGS	Annual	1. The Marengo gage will be the flow point for the MSA and monitoring spawning and rearing flows. 2. The USGS gage will be the flow point for the mSA and passage.
	Hydrograph	Anchor 2011a	Developed in 2011	SRSRB and CCD	Once	The model was developed as part of the Geo Assessment report completed for the CCD
	Bed load	Anchor 2011a	2010 Baseline	CCD/SRSRB	Once	
Water Quality	Temperature	WDOE Marengo gage WDFW/USFS temperature logger	2003 to present	SRSRB/ WDOE	Annual	The Marengo gage will be used as a surrogate for the MSA. Additional data points will be used or developed to considered based on need
	Turbidity/fines	USFS/CCD turbidity ISCOS			Annual	
	Embeddedness	CCD Field Assessment reports			Periodic	
Riparian	Riparian Cover	Remote sensing images Orthos and 2010 LIDAR	1994, 1996, 2003, 2005, 2006, 2009, 2010, 2011	USGS, USDA, SRSRB	2yr	94 data is USGS and covers Bridge below Last Chance Resort to below Little Tucannon. 2010 data is SRSRB data. The rest is USDA
	Maturity/Com position	LIDAR canopy height and field surveys	April 2010 Baseline	SRSRB or CCD	5yr	LIDAR was acquired in April 2010 and analysis will be finalized in 2012
Channel Habitat Complexity	Channel Type	Anchor 2011a	2010	CCD	5yr	The channel type is descried in report
	Pools/Channel Shape	1. CHaMP 2. Historic USFS Surveys 3. Pre/post restoration monitoring	1. 2011 Baseline 2. 1999-etc 3. 2012 Baseline	1. CHaMP 2. USFS 3. SRSRB	Annual & Periodic	1. CHaMP is conducting a main stem w/25 sites visited each year 2. 3. The pre/post monitoring sites would be at restoration sites (use CHaMP protocol)
	Key LWD Pieces	1. CHaMP 2. Anchor 2011b	1. 2011 Baseline 2. 2011 Baseline	1. CHaMP 2. SRSRB	1. Annual 2. Once	1. CHaMP will measure change in LWD 2. Anchor Report provided and estimate of river length meeting the # of LWD/Channel width.
	Off Channel Habitat	1. CHaMP 2. Anchor 2011b	CHaMP 2011 Baseline Anchor 2010 only	1. CHaMP 2. SRSRB	Annual & 5yr	Channel length calculations will be extracted from the 5 yr LIDAR flights
Channel Confinement	Floodplain	Anchor 2011b	2010 baseline??? unless there is more	SRSRB	5 yr	Floodplain can be updated by 5yr LIDAR data
	Channel Length	Anchor 201a)	1954, 1974, 1996, 2010 Aerial Images & 2010 LIDAR	SRSRB	5 yr	The Time series will be extended by additional yrs and would be updated by the 5 yr LIDAR