CTUIR GRANDE RONDE SUBBASIN RESTORATION PROJECT ANNUAL REPORT

A Columbia River Basin Fish Habitat Project

Northwest Power Planning Council Project # 199608300

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CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

BONNEVILLE POWER ADMINISTRATION

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Introduction/Background Information

The **CTUIR Grande Ronde Subbasin Restoration Project** was initiated by the Confederated Tribes of the Umatilla Indian Reservation in 1996 to protect, enhance, and restore riparian and instream habitat for natural production of anadromous salmonids in the Grande Ronde River Subbasin. The project works with other agencies and private landowners to promote land stewardship and enhance habitat for focal fish, primarily spring chinoook salmon, summer steelhead, bull trout, and resident trout. Emphasis is placed on improving improving juvenile rearing habitat and adult spawning habitat with emphasis on restoring natural channel morphology and floodplain function, cold water refuge and complex aquatic habitat that supports required life histories for focal species.

During 2014, the CTUIR was involved in numerous planning processes and projects. Planning efforts included: Snake River Basin salmon and steelhead recovery planning, including Project Leader participation on the technical review habitat team, BiOp Remand project planning and participation the technical review team, participation on the Grande Ronde Model Watershed Board and Technical Committees, and coordination with multiple agencies, organizations, and private landowners associated with fish habitat project development. Additionally, project staff continued BPA-CTUIR Accord land acquisition planning, identification, and development of future site specific fish habitat projects. Project development and initial planning included; baseline field surveys, assessments, development of conceptual project plans, coordination with private landowners, and initiation of environmental planning.

Fish habitat project implementation during the reporting period included large wood installation, boulder cluster placement, and fish salvage on Rock Creek - Phase II of the Rock Creek Fish Habitat Enhancement Project, construction of engineered large wood structures and fish salvage on the Catherine Creek (CC 44) Phase II Fish Habitat Enhancement Project, construction of a riparian easement fence on the Catherine Creek (CC44) Fish Habitat Enhancement Project, and riparian tree and shrub plantings on the Rock Creek and Catherine Creek (CC 44) Fish Habitat Enhancement Projects. Projects were administered and inspected by CTUIR Grande Ronde Fish Habitat Project staff during July 2014 through January 2015. Preparation for project construction included field stakeout and survey, construction subcontracting and administration, field supervision, grade checking, and inspection.

CTUIR staff also conducted monitoring and evaluation, including water temperatures, groundwater elevations, vegetation, geomorphic and instream habitat, biological, and photo points.

Work during the reporting period also included coordinating, planning, field surveys, and initial project development/design for upcoming projects along the main-stem of Catherine Creek, Grande Ronde River, and Rock Creek. Activities included coordinating with project partners and private landowners to develop future project opportunities, baseline field investigations and surveys, development of conceptual plans, initiation of funding proposals, and initiation of environmental compliance planning in preparation for further project development and implementation in 2014 and beyond.

Background

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) retain aboriginal and treaty rights related to fishing, hunting, pasturing of livestock, and gathering of traditional plants within the Tribes Ceded Territory, including the Grande Ronde Subbasin. The CTUIR Department of Natural Resources (DNR) has developed and accepted a First Foods organization and approach to ecosystem management based on the cultural traditions and practices of the Longhouse. The organization follows the serving order of food and conceptually "Extends the Table" to manage for sustainability within the Ceded Territory. The First Foods are considered to be the minimum ecological products necessary to sustain CTUIR culture. The order is watershed-based beginning with water as the foundation and progressing to salmon (Pacific lamprey, steelhead, trout, and whitefish), deer, couse, and huckleberry. The First Foods provide clear linkages to treaty rights and natural resources and defines direction and goals that relate to the community culture. In conjunction with the First Food principle, the CTUIR DNR developed the River Vision (Jones, 2008)that describes and organizes ecological processes and functions that provide the First Foods.

The River Vision outlines physical and biological processes encompassing 5 touchstones: **Hydrology, Geomorphology, Connectivity, Riparian Vegetation, and Aquatic biota** which together with the First Foods, provide an overall framework for guiding tribal programs in regards to protecting and restoring ecological processes and functions. Health watershed processes and functions are the fundamental elements that create diversity, resiliency, and the ability of our river systems to provide sustenance and natural resources to support our culture and heritage.

The Subbasin historically supported viable and harvestable populations of spring/summer and fall Chinook salmon (*Oncorhynchus tshawytscha),* coho salmon (*O. kisutch*), sockeye salmon (*O. nerka),* summer steelhead *(O. mykiss),* Pacific lamprey (*Entosphenus tridentatus*), bull trout (*Salvelinus confluentus*), rainbow/redband *(O. mykiss sp.),* and mountain whitefish (*Prosopium williamsoni).* These native fishes are paramount to tribal cultures, economies and the region (CBFWA, 1990) and (CRITFC, 1995). Beginning in the late 1800's, fish populations started to

decline with sockeye and coho extirpated in the early 1900's. The abundance of Chinook, steelhead, bull trout, and other fish species has also been dramatically reduced (NPCCa, 2004) and (NPCCb, 2004). With declining fish populations, Tribal governments and State agencies were obligated to eliminate or significantly reduce subsistence and sport fisheries by the mid 1970's. By the early 1990's, Snake River spring-summer Chinook and summer steelhead populations were suppressed to the point of triggering Federal ESA listings (spring-summer Chinook in 1992 and summer steelhead in 1997, and bull trout in 1998). Other native fish, including Pacific lamprey populations are also highly suppressed and with possible future ESA listing possible. The following tables illustrate estimated historic and current spring Chinook salmon and summer steelhead returns to the Grande Ronde Subbasin (NPCCa, 2004). Of particular note is an 87 percent decrease in spring Chinook and 70 percent decrease in summer steelhead populations from estimated historic levels.

Summary of estimated historic and current Grande Ronde spring Chinook salmon returns by population (data provided by B. Jonnasson, ODFW pers. comm. 2004).

Population	Estimated Historic Returns count	Estimated Historic Returns % of total	Estimated Current Returns count	Estimated Current Returns % of total	Miles of spawning habitat	Adults /Mile Template	Adults /Mile Current	% Decrease Historic to Current
Wenaha Spring Chinook	1,800	15%	453	30%	*45.60*	39.48	9.94	75%
Minam Spring Chinook	1,800	15%	347	23%	*42.54*	42.31	8.16	94%
Wallowa-Lostine Spring Chinook	3,600	30%	211	14%	*56.10*	64.17	3.76	95%
Lookingglass Spring Chinook	1,200	10%	190	12%	*29.82*	40.24	6.37	81%
Catherine Creek Spring Chinook	1,200	10%	188	12%	*29.82*	40.24	6.30	84%
Upper Grande Ronde Spring Chinook	2,400	20%	132	9%	*79.11*	30.34	1.67	84%
Total	**12,000**		**1,521**		***283.00***	**42.4**	**5.37**	**87%**

Summary of estimated historic and current Grande Ronde summer steelhead returns by population (data provided by B. Jonnasson, ODFW pers. comm. 2004).

Population	Estimated Historic Returns count	Estimated Historic Returns % of total	Estimated Current Returns count	Estimated Current Returns % of total	Miles of spawning habitat	Adults /Mile Template	Adults /Mile Current	% Decrease Historic to Current
Lower Grande Ronde	2,400	16%	608	14%	253.84	9.45	2.39	75%
Joseph Creek	3,600	24%	945	21%	223.10	16.14	4.24	74%
Wallowa River	3,750	25%	1,193	27%	173.45	21.62	6.88	68%
Upper Grande Ronde	5,250	35%	1,755	39%	613.96	8.55	2.86	67%
Total	**15,000**		**4,500**		1,264.35			**70%**

The **CTUIR Grande Ronde Subbasin Restoration Project** (199608300), funded by Bonneville Power Administration (BPA) through the Northwest Power Planning Council Fish and Wildlife Program (NPPC), is an ongoing effort initiated in 1996 to protect, enhance, and restore fish habitat in the Grande Ronde River Subbasin. The project focuses on the mainstem Grande Ronde and major tributaries that provide spawning and rearing habitat for Threatened Snake River spring-summer chinook salmon, summer steelhead, and bull trout. The project also provides benefits to other resident fish and wildlife.

The project is an integral component of Subbasin Plan implementation and is well integrated into the framework of the Grande Ronde Model Watershed (GRMW) established by the NPCC in 1992 to coordinate restoration work in the Subbasin. As a co-resource manager in the Subbasin, the CTUIR contributes to the identification, development, and implementation of habitat

protection and restoration in cooperation with Federal, State, and local agencies. The CTUIR, ODFW, GRMW, and other participating agencies and organizations have made significant progress towards addressing habitat loss and degradation in the Subbasin (see http://www.grmw.org/).

The project was initiated in 1996 under the NPCC-BPA Early Action Project process. The project was proposed through the GRMW and NPCC program to provide the basis from which to pursue partnerships and habitat grant funds to develop and implement watershed and fish habitat enhancement activities in the Subbasin. Annual project budgets have averaged about $136,000 and ranged from a high of $200,000 in 1999. Annual operating budgets and associated tributary habitat efforts by the CTUIR were increased as a result of the CTUIR-BPA Accord Agreement with an annual average budget of $589,500. The project has historically administered multiple grants from various agencies, including Natural Resource Conservation Service (NRCS) Wetland Reserve Program (WRP), CREP, WHIP, and EQUIP, OWEB, EPA-ODEQ 319, GRMW-BPA, CRITFC, NMFS, USFWS, ODOT, and NAWCA and developed an effective working relationship with multiple agencies and organizations.

The project has been successful in the development and implementation of several large-scale, partnership habitat enhancement projects and has developed effective interagency partnerships, working at the policy and technical levels with the Grande Ronde Model Watershed Program (GRMWP), federal and state agencies, and private landowners. A complete project overview and technical approach is described in the 2013 NPPC Project Proposal for the CTUIR Watershed Restoration Project (199608300) incorporated here by reference.

During the 19-year project history, the CTUIR has helped administer and implement a number of projects, enhancing nearly 50 miles of instream habitat. Conservation easements totaling about 1,900 acres on six large ranches/farms have been secured through a combination of NRCS WRP, CREP, and BPA programs. The project has constructed 18 miles of fence, 18 off-channel water developments, and installed over 160,000 trees, shrubs, sedge/rush plugs, and seeded over 800 acres with native/native-like grass seed. Improving habitat trends and biological response can be readily observed at a number of projects. A combination of both passive and active strategies have been developed and implemented and although project areas are in an early stage of recovery, establishment of conservation easements, construction of riparian/wetland enclosure fencing, development of off-channel water sources, removal of livestock, re-vegetation efforts, instream work such as restoration channel construction and large wood additions, and removal of dikes and old roadbeds and railroad prisms have resulted in improving trends.

Project results are reported in various forms including Pisces status reports, project completion reports, and annual reports. The GRMW maintains a complete database on project implementation and results through development of project completion reports.

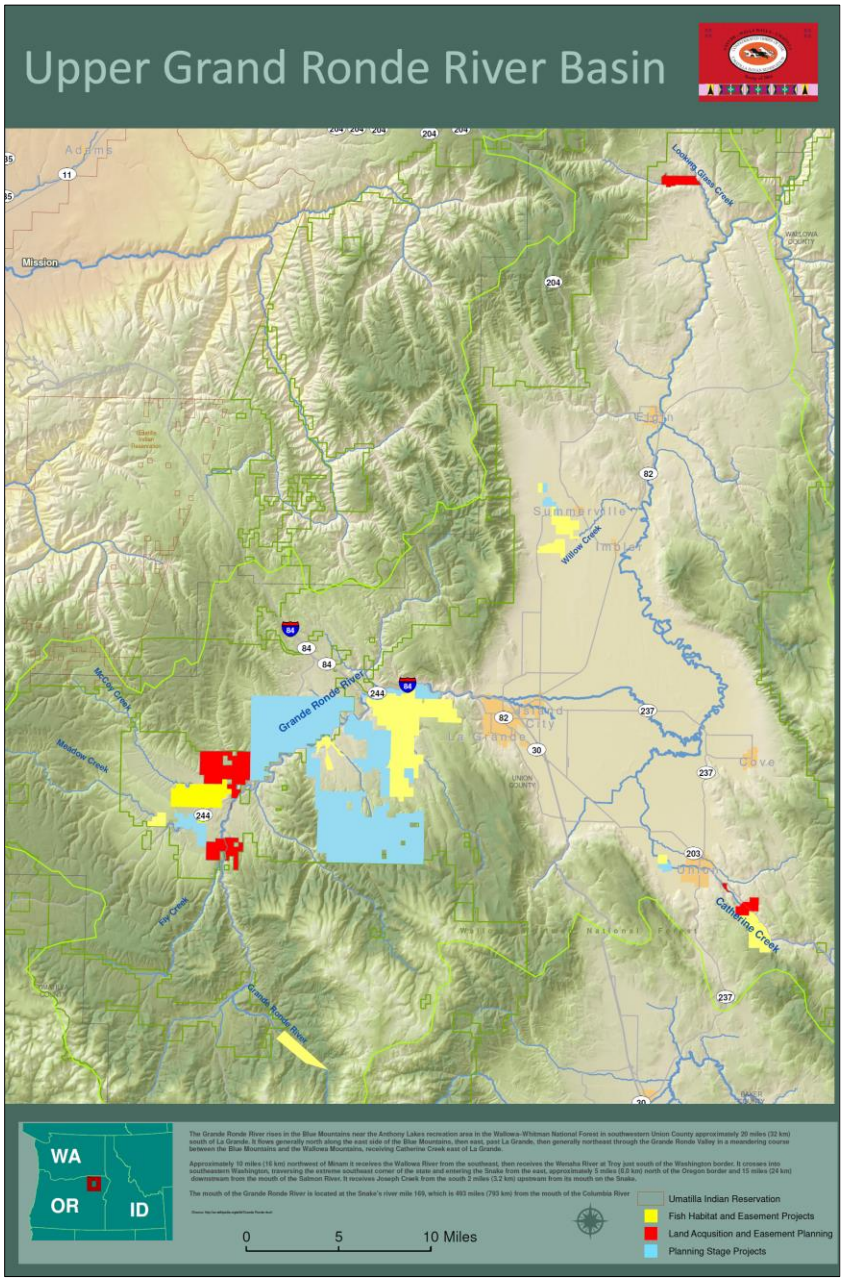
Description of Project Area

The project is located in the Grande Ronde Subbasin, located in the southwest portion of the Blue Mountain Ecological province. The Subbasin encompasses about 4,000 square miles in northeastern Oregon and southeastern Washington. The headwaters of the Grande Ronde River

originate near Anthony Lakes in the Elkhorn Mountains and flows northeast for about 212 miles before joining the Snake River in Washington at river-mile (RM) 169.

The Subbasin is divided into three watershed areas—the Lower Grande Ronde, Upper Grande Ronde, and Wallowa watersheds. Approximately 46 percent of the Subbasin is under federal ownership. Historic land uses include timber harvest, livestock grazing, mining, agriculture and recreation.

FIGURE 1 UPPER GRANDE RONDE SUBBASIN VICINITY AND PROJECT LOCATIONS



A comprehensive overview of the Subbasin is contained in the Grande Ronde Subbasin Plan (NPPC, 2004). The CTUIR Grande Ronde Subbasin Restoration Project focuses primarily on the Upper Grande Ronde portion of the Subbasin, which includes approximately 1,650 square miles with 917 miles of stream network (about 221 miles of salmon habitat). However, past project development and success of the program in terms of the types of project that have been developed and the partnerships that have formed, are leading to watershed restoration project opportunities throughout the Subbasin. Figure 1 illustrates the vicinity of the Grande Ronde Subbasin within the Blue Mountain Province and key projects that have been completed, are underway, or planned under the CTUIR's Grande Ronde Subbasin Restoration Project.

The Subbasin historically supported viable and harvestable populations of spring-summer and fall Chinook salmon (*Oncorhynchus tshawytscha),* coho salmon (*O. kisutch*), sockeye salmon (*O. nerka),* summer steelhead *(O. mykiss),* Pacific lamprey (*Entosphenus tridentatus*), bull trout (*Salvelinus confluentus*), rainbow/redband *(O. mykiss sp.),* and mountain whitefish (*Prosopium williamsoni).* These native fishes were an important part of tribal cultures and economies (CBFWA, 1990 and CRITFC, 1995) and European settlers as well.

Beginning in the late 1800's, fish populations started to decline with sockeye and coho extirpated in the early 1900's. The abundance of Chinook, steelhead, bull trout, and other fish species has also been dramatically reduced (NPCC 2004 a, and b). With declining fish populations, Tribal governments and State agencies were obligated to eliminate or significantly reduce subsistence and sport fisheries by the mid 1970's.

Grande Ronde Subbasin fish populations have declined and habitat degradation is widespread in tributary streams. Mainstem Columbia River harvest, development of Columbia and Snake River hydroelectric projects, and habitat degradation has played an important role in the demise of Grande Ronde Subbasin fisheries (NPCC 2004a and b).

With declining populations, the Federal government listed spring/summer Chinook salmon, summer steelhead, and bull trout as threatened species under the Endangered Species Act in 1992, 1997, and 1998, respectively. The status of Pacific lamprey is unclear at this time and may have been extirpated from the Subbasin.

Although hatchery programs currently support subsistence and sport fishing opportunities for steelhead and limited Chinook salmon, there remains significant need to re-build viable and harvestable fish stocks throughout the Subbasin.

The following tables illustrate estimated historic and current spring Chinook salmon and summer steelhead returns to the Grande Ronde Subbasin (NPCC 2004a). Of particular note is an 87 percent decrease in spring Chinook and 70 percent decrease in summer steelhead populations from estimated historic levels.

TABLE 1 SUMMARY OF ESTIMATED HISTORIC AND CURRENT GRANDE RONDE SPRING CHINOOK SALMON RETURNS BY POPULATION (DATA PROVIDED BY B. JONNASSON, ODFW PERS. COMM. 2004)

Population	Estimated Historic Returns count	% of total	Estimated Current Returns count	% of total	Miles of spawning habitat	Adults /Mile Template	Adults /Mile Current	% Decrease Historic to Current
Wenaha Spring Chinook	1,800	15%	453	30%	*45.60*	39.48	9.94	75%
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Upper Grande Ronde Spring Chinook	2,400	20%	132	9%	*79.11*	30.34	1.67	84%
Total	**12,000**		**1,521**		***283.00***	**42.4**	**5.37**	**87%**

TABLE 2 SUMMARY OF ESTIMATED HISTORIC AND CURRENT GRANDE RONDE SUMMER STEELHEAD RETURNS BY POPULATION (DATA PROVIDED BY B. JONNASSON, ODFW PERS. COMM. 2004)

Population	Estimated Historic Returns count	% of total	Estimated Current Returns count	% of total	Miles of spawning habitat	Adults /Mile Template	Adults /Mile Current	% Decrease Historic to Current
Lower Grande Ronde	2,400	16%	608	14%	253.84	9.45	2.39	75%
Joseph Creek	3,600	24%	945	21%	223.10	16.14	4.24	74%
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Total	**15,000**		**4,500**		1,264.35			**70%**

Figures 2 and 3 display estimates of historic and current abundance, productivity, and life history diversity predicted through the Ecosystem Diagnosis and Treatment (EDT) Method for Grande Ronde Subbasin Chinook salmon and summer steelhead, respectively (NPCC, 2004a and Mobrand, 2003). Graphs illustrate that current abundance, productivity, and life history diversity for spring Chinook and summer steelhead has been reduced from estimated historic levels.

Chinook and steelhead populations furthest from historic potential are in geographic areas that have experienced the highest levels of anthropogenic influence with significant declines illustrated for Wallowa-Lostine, Catherine Creek, Lookingglass, and Upper Grande Ronde spring Chinook and Upper Grande Ronde, Wallowa, and Joseph Creek summer steelhead. Current productivity and life history diversity for spring Chinook in the Wenaha and Minam watersheds (primarily designated wilderness areas) is similar to estimated historic conditions (NPPC, 2004a).

FIGURE 2 EDT ESTIMATES OF ABUNDANCE, PRODUCTIVITY, AND LIFE HISTORY DIVERSITY COMPARED TO THE ESTIMATED HISTORIC POTENTIAL FOR GRANDE RONDE SUBBASIN CHINOOK SALMON (NPCC 2004A, FIGURE 8, PG. 54)

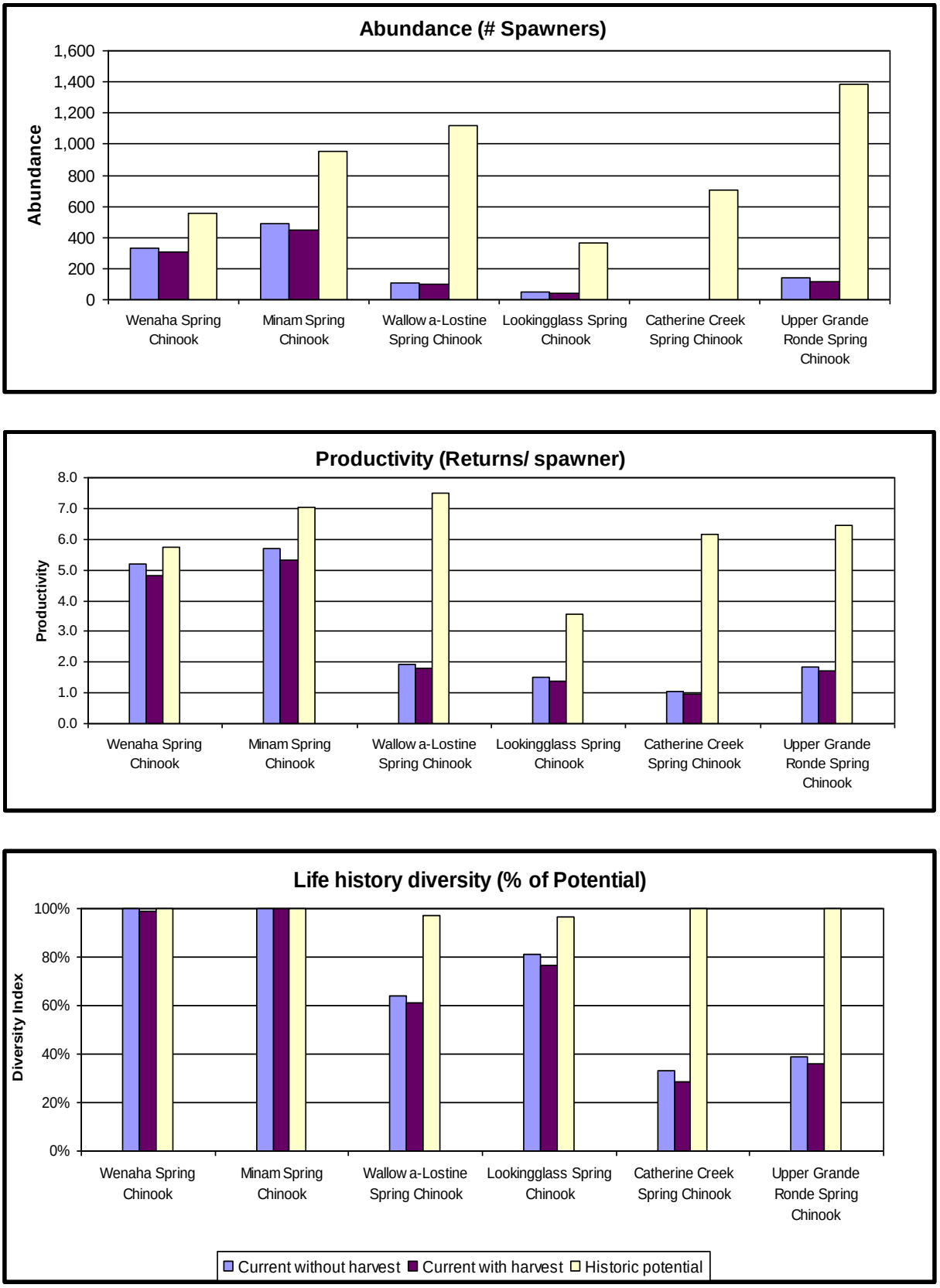
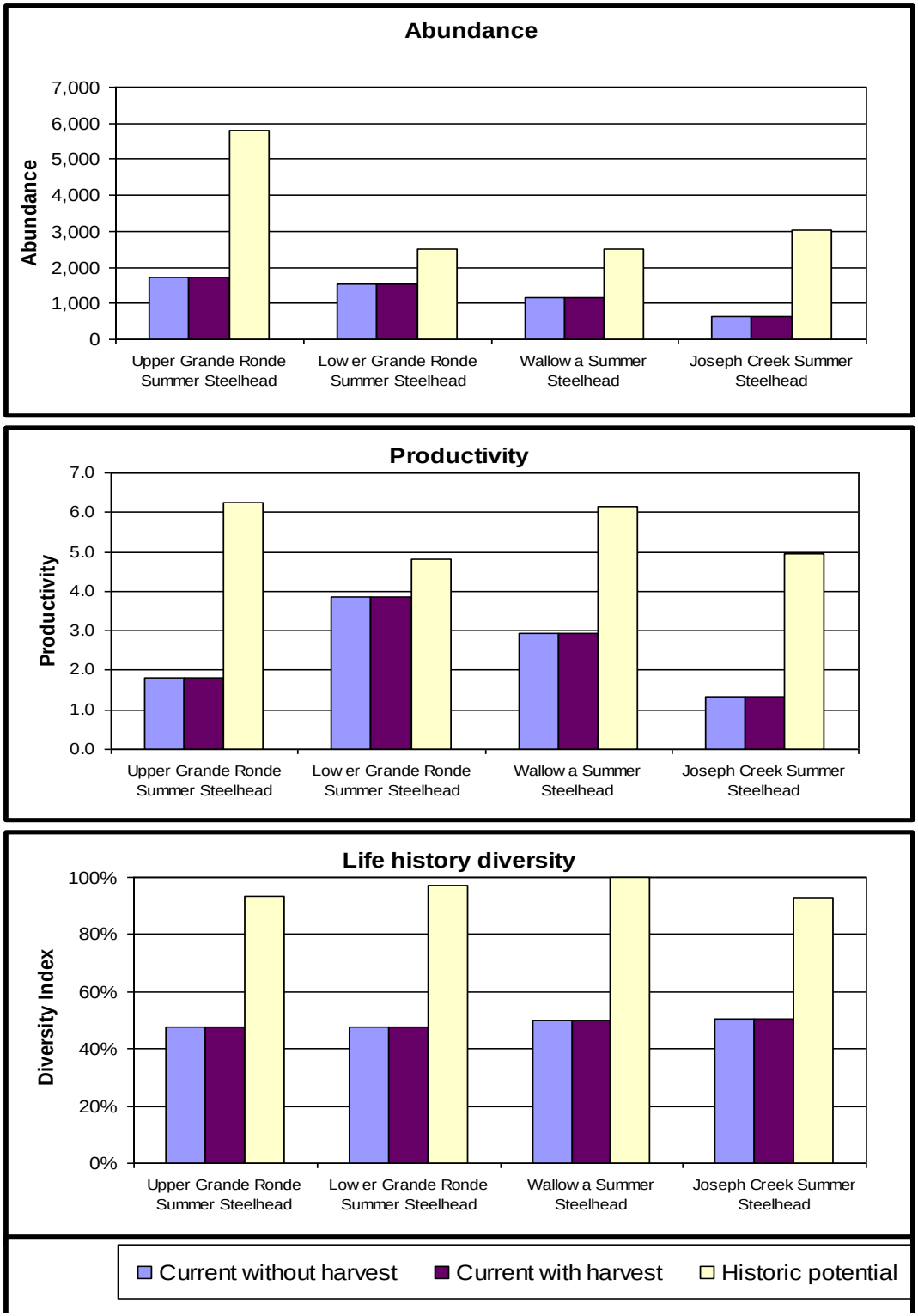


FIGURE 3 **EDT ESTIMATES OF ABUNDANCE, PRODUCTIVITY, AND LIFE HISTORY DIVERSITY COMPARED TO ESTIMATED HISTORIC POTENTIAL FOR GRANDE RONDE SUBBASIN SUMMER STEELHEAD (NPCC 2004A, FIGURE 22, PG. 72)**



Degradation of instream and riparian habitat in the Subbasin has been the dominant cause of salmon and steelhead decline (NPCC, 2004). The adverse effects of poorly managed logging, grazing, mining, dams, irrigation withdrawals, urbanization, exotic species introductions, and other human activities have been documented in all of Columbia River tributaries (ISG 1996). Riparian and instream habitat degradation has most severely impacted spring Chinook production potential in the Grande Ronde Subbasin (ODFW and CTUIR 1990, NPCC 2004a) and habitat loss and degradation has been widespread with the exception of road-less and wilderness areas (Anderson et al. 1992; CTUIR 1983; Henjum et al.1994; McIntosh et al. 1994).

Approximately 379 miles of degraded stream miles have been identified in the Subbasin (ODFW et al. 1990), with an estimated 80 percent of anadromous fish habitat in a degraded condition (Anderson et al. 1992). McIntosh (1994) documented a 70 percent loss of large pool habitat in the Upper Grande Ronde River since 1941. Riparian shade on low gradient streams was found to be less than 30 percent (Huntington, 1993). Stream channelization, diking, wetland drainage, and use of splash dams was a common and widespread practice until the 1970's and resulted in severe channel incision and degradation in some locations. The Oregon Department of Environmental Quality (ODEQ) listed over 60 stream reaches in the Subbasin on the State's list of water quality limited water bodies 303 (d). Of these stream segments, 24 are listed for habitat modification, 27 for sediment, and 49 for temperature. Table 3 illustrates priority areas for water quality treatment in the Subbasin (ODEQ, 2000).

TABLE 3 GEOGRAPHIC PRIORITY AREAS FOR WATER QUALITY TREATMENT IN THE UPPER GRANDE RONDE WATERSHED DEVELOPED THOURSOUGH TMDL PROCESS (H=HIGH, M=MEDIUM, L=LOW) (NPCC 2004A, TABLE 18, ODEQ, 2000)

Watershed	Temperature	Sediment	Flow
Lookingglass	L[1]	L	L
Lower Grande Ronde	L	L	L
Willow/Philips	H	H	H
Indian/Clark	M	M[2]	M
Catherine Creek	H	H	H
Beaver	M	M	L[3]
GRR Valley	H	H	H
Ladd Creek	H	H	H
Upper Grande Ronde	H	H	H[4]
Meadow Creek	H	H	H[4]
Spring/Five Pts.	H	M	M

Watershed analysis through the EDT (NPCC, 2004a and Mobrand, 2003) and synthesis through the Subbasin Plan Management Plan development process, identified instream habitat condition, high water temperature, sediment loads, and flow modification as primary limiting factors for Chinook and steelhead (pg. 11 NPCC 2004c, pg. 3 NPCC 2004d). Primary habitat degradation includes:

- **Channel Habitat Conditions** – Channel instability associated with removal of streamside cover and channelization has resulted in channel incision/down cutting, increased gradient, reduced channel length, elevated erosion, increased width-to-depth ratios, and loss of channel complexity. The quality of instream

habitat has correspondingly been altered throughout much of the Subbasin.

- **Sediment** – Loss of upland and streamside vegetative cover has increased the rates of erosion. Soils lost from upland areas has overwhelmed hydraulic processes resulting in decreased availability of large pool habitat, spawning areas, riffle food production, and hiding cover.
- **Riparian Function** – Riparian habitat degradation is the most serious habitat problem in the subbasin for fish (McIntosh 1994, ICBEMP 2000). Loss of flooplain connectivity by roads, dikes, and channel incision, and in many streams reduced habitat suitability for beaver has altered dynamically stable floodplain environments which has contributed to degradation and limited habitat recovery. This loss leads to secondary effects that are equally harmful and limiting, including increased water temperature, low summer flows, excessive winter runoff, and sedimentation.
- **Low Flow** – Water resources in many streams have been over over-appropriated resulting in limited summer and fall base flow, development of fish passage barriers, and increased summer water temperatures.

Table 4 illustrates key habitat limiting factors by geographic priority area. The table has been edited from the Subbasin plan to depict only those geographic areas addressed under this proposal. These geographic priority watersheds have been identified as the three highest priority areas to conduct habitat restoration with the greatest response in Chinook salmon and steelhead production potential (NPCC, 2004a, Supplement, Pgs 49-50, Table 5-6).

TABLE 4 GRANDE RONDE SUBBASIN PRIORITY GEOGRAPHIC AREAS AND HABITAT LIMITING FACTORS (NPCC, 2004A)

Watershed	Fish Population(s)	EDT Priority Geographic Area(s) highlighted areas are priorities for multiple pops.	Habitat Limiting Factors
Wallowa River (including Lostine River)	Wallowa Steelhead Wallowa-Lostine Chinook Lostine/ Bear Ck Bull Trout	**Steelhead Priorities** Prairie Creek Upper Wallowa River –Wallowa Chinook Hurricane Ck , Whiskey Ck Lower Wallowa (1-3) -Minam Steelhead **Chinook Priorities** Lower Lostine – Wallowa Steelhead Mid-Wallowa – Wallowa Steelhead	➢ Key Habitat Quantity (reduced wetted widths) ➢ Habitat Diversity (reduced wood, riparian function) ➢ Sediment ➢ Temperature ➢ Flows
Upper Grande Ronde	Upper GR Steelhead Upper GR Chinook Upper GR Complex Bull Trout	Mid GR 4 (GR 37 - 44) - Chinook Mid GR Tribs 4 (Whiskey, Spring, Jordan, Bear, Beaver, Hoodoo…) Phillips Creek Upper GR Ronde 1 (45-48) - Chinook Mid GR 3 (GR – 34-36) Valley Sheep Ck, Fly Ck, Lower Meadow Ck - Chinook	➢ Sediment ➢ Flow ➢ Temperature ➢ Key Habitat Quantity (reduced wetted widths)
Catherine Creek/ Middle Grande Ronde	Upper GR Steelhead Catherine Ck Chinook Catherine Ck Bull Trout Indian Ck Bull Trout	Mid Catherine Creek (2-9) – UGR Sthd SF, NF Catherine Creek Lower Grande Ronde R. 2	➢ Key Habitat Quantity (reduced wetted widths) ➢ Habitat Diversity (reduced wood, riparian function) ➢ Sediment ➢ Flow ➢ Temperature

Habitat protection and restoration needs in the Subbasin have been recognized in numerous reviews, planning processes, and reports (CTUIR, 1983), Noll and Boyce 1988, (ODFW, 1990),

Wallowa-Whitman et.al. 1992, (Huntington, 1993) GRMWP (1994), (Mobrand, 2003), (NPCC, 2009), and (NPCCa, 2004). NPCC (2004a) Appendix 5 (pg 254) provides a relatively complete list of habitat protection and restoration strategies that can be applied to achieve goals and objectives. The NMFS proposed recovery plan for Snake River Chinook salmon recognized the importance of tributary habitat restoration and protection of habitat on both federal and private lands to chinook an steelhead recovery (NMFS, 1997). NMFS has recently restarted the recovery planning effort for Chinook salmon and steelhead and tributary habitat restoration and is expected to play a prominent role in the final NMFS recovery plan. (NRC, 1996) also noted the importance of protecting and rehabilitating freshwater habitat as part of salmon recovery. They specifically note the importance of riparian areas and recommend that habitat reclamation or enhancement should emphasize rehabilitation of ecological processes and function. The USFWS draft bull trout recovery plan recognized the importance of habitat protection and restoration as well (USFWS, 2002) specifically noting the need to improve water quality, reduce or eliminate fish passage barriers, and restoring impaired instream and riparian habitat.

Noteworthy Accomplishments during FY2014

- Implemented fish habitat enhancement activities on the Catherine Creek (CC 44) Phase II and Rock Creek Phase II Projects.
- Installed approximately 167 large wood complexes14 boulder clusters, and removed approximately 3,500 cubic yards of levees on the Rock Creek Phase II Project.
- Conducted pre-construction fish salvage operations on the Catherine Creek (CC44) and Rock Creek Fish Habitat Enhancement Projects.
- Maintained and monitored a 15 year riparian conservation easement along 0.75 mile of Catherine Creek (CC37 Project).
- Conducted baseline and post project morphological surveys along 2 miles of Catherine Creek.
- Initiated planning, field surveys, and design on projects planned for construction during 2015 through 2017 including:
    - Catherine Creek (CC44) Project in cooperation with the Union Soil and Water Conservation District (USWCD), Bureau of Reclamation (BOR), and Oregon Department of Fish and Wildlife (ODFW). Project covers 4 miles of mainstem Catherine Creek.
    - Continued morphological surveys and project design on Rock Creek and Graves Creek.
    - Bird Track Springs Project in cooperation with the Bureau of Reclamation (BOR) and the U.S. Forest Service, covering over 4 miles of the mainstem Grande Ronde River and several side channel habitats.
    - Starkey Meadows Project in cooperation with the Bureau of Reclamation (BOR) and the U.S. Forest Service, covering approximately 1/2 mile of the mainstem Grande Ronde River.
    - Dry Creek (Aiwohi property) in cooperation with UCSWCD, covering approximately 0.6 miles of stream contiguous with the Oregon Ag Foundation Willow Creek Project implemented in 2012.

- Continued the Land Acquisition Planning process for several properties including the Cunha Ranch aimed at securing a permanent conservation easement on the 2,928 acre ranch, and acquisition of the 545 acre Southern Cross Ranch.
- Signed riparian conservation easements for the Kirby and Fite properties (CC44), protecting approximately 30 acres of riparian areas and approximately .75 miles of Catherine Creek.
- Administered fence construction contract on the Kirby and Fite easements.
- Project Leader participated on the Grande Ronde Model Watershed Board of Directors and Technical Team to review and develop projects, including BiOp/Remand Projects.
- Project Leader participated on the Snake River Salmon and Steelhead Recovery Team (Habitat).
- Project Leader and Assistant Biologist participated in the Technical Advisor Committee for the Atlas Process.
- Assistant Biologist participated in OWEB small grant committee.
- Project Leader and Assistant Biologist participated in NRCS Local Working Group and Regional conservation Partnership Program planning.
- Project Staff attended relevant trainings and classes (River Restoration Northwest, CHAMPS snorkel training).
- Staff conducted monitoring and evaluation activities on project areas.
- Pursued future restoration efforts by continuing discussions with both state and private landowners about restoration opportunities along Dry Creek, Whiskey Creek, Indian Creek, Rock Creek, Little Rock Creek, Graves Creek and the Grande Ronde River (State Parks and ODOT).
- Project staff coordinated with landowners, NRCS, and UCSWCD to provide technical assistance for restoration project enrollment in EQUIP, CREP, and OWEB small grants. This work included:
    - Willow Creek-OAF, Stephen Craig, and Wiseman property
    - Rock Creek (For the Girls LLC)
    - CC44 - Fite (spring development-small grant)
    - CC44 - Kirby
- Project staff participated in public outreach activities including:
    - Newspaper article about the Rock Creek Project for the Grande Ronde Model Watershed Ripples newsletter
    - Assistant Biologist conducted presentation to the Oregon Dept. of Transportation Environmental Coordination group.

Discussion of Completed Work

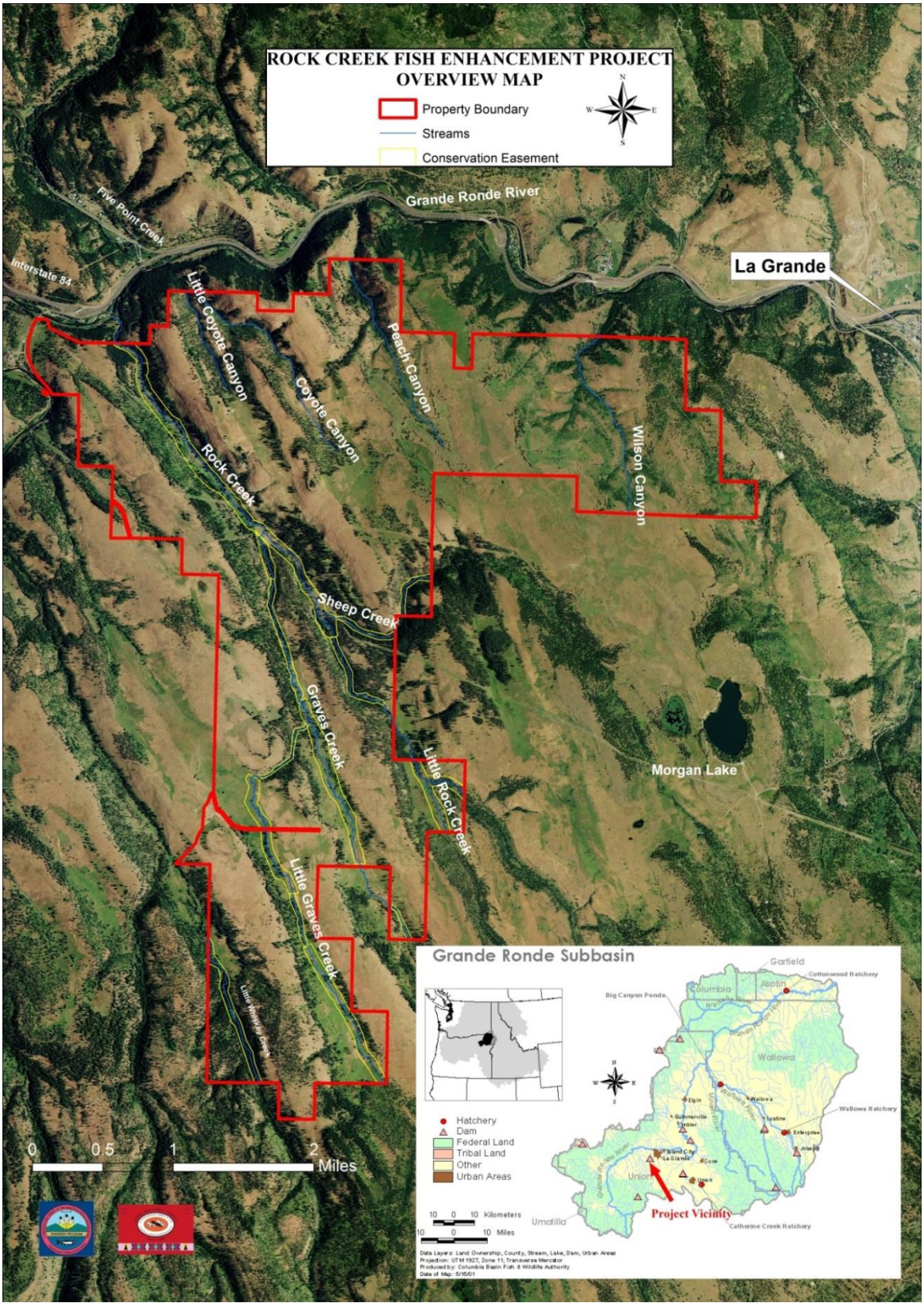
Rock Creek Phase II

The Rock Creek Project encompasses nearly 16 miles of fish habitat on Rock, Little Rock, Sheep, Graves, Little Graves, and Little Whiskey Creek within the UGC-2 and UGS-16 recovery plan assessment units. UGS-16 has been identified by the BiOp Expert Panel as one of the highest priority geographic units to protect and restore summer steelhead habitat. UGC-2 is identified as having high intrinsic potential for Chinook in the lower reaches of Rock Creek and low to medium intrinsic potential for Chinook within upper stream reaches. The lower reaches have been shown to provide juvenile Chinook rearing habitat from data collected during snorkel surveys conducted by CTUIR staff in 2011 and 2012. The presence of juvenile Chinook within this degraded system emphasizes the need for these restoration efforts and is an indication of the importance of these tributaries in the recovery of salmonid fish populations within the Grande Ronde Basin.

The project is located 6.8 miles west of La Grande, Oregon in Township 3 South, Range 37 East, all or portions of Sections 5, 6, 8, 9, 16, 20, 21, and 28 at an elevation range of 3,000 to 4,000 feet. This project area is characterized as a typical mid-elevation Blue Mountain forested watershed interspersed with open dry meadows in the uplands and typically narrow floodplains. Stream channel types include Rosgen B2 and B3 channels in steeper forested reaches and C3/C4 channel types in low gradient wide valley forms.

The project is located on the ‘For the Girls LLC’ ranch and covers 4.9 miles of Rock Creek, 0.4 miles of Little Rock Creek, 1.2 miles of Little Whiskey Creek, and 1 mile of Sheep Creek within the ranch boundary.

FIGURE 4 PROJECT VICINITY MAP



Project Vision

The vision of the project is to restore degraded riparian and floodplain habitat, improve instream habitat diversity, and improve water quality for adult and juvenile summer steelhead and juvenile Chinook salmon. This vision follows the landowners request to improve fish habitat on his property, which is located in a BiOp high priority recovery area, and is consistent with the Tribes "First Foods" concept, which manages the ecosystem based on protection of water, fish, deer and elk, roots, and berries. The First Foods provide clear linkages to treaty rights and natural resources and defines direction and goals that relate to the community culture. In conjunction with the First Food principle, the CTUIR DNR developed the River Vision (Jones et. al., 2008) that describes and organizes ecological processes and functions that provide the First Foods.

The River Vision outlines physical and biological processes encompassing 5 touchstones: Hydrology, Geomorphology, Connectivity, Riparian Vegetation, and Aquatic biota which together with the First Foods, provide an overall framework for guiding tribal programs in regards to protecting and restoring ecological processes and functions. Healthy watershed processes and functions are the fundamental elements that create diversity, resiliency, and the ability of our river systems to provide sustenance and natural resources to support our culture and heritage.

Project Goal Statement

The overall goal of the project is to restore and protect hydrologic and geomorphic processes and functions that provide high quality spawning and rearing habitat for Threatened Snake River Basin ESA fish stocks and resident fishery resources within the UGC-2 and UGS-16 recovery plan assessment units.

Project Objectives

Project objectives include habitat protection, re-activating the historic floodplain and associated channel network, increasing hyporheic connectivity and cold water refuge, facilitating vegetative recovery, increasing instream habitat complexity, and encouraging long-term beaver re-colonization.

- **Protect Habitat:** Develop riparian easement (CTUIR/BPA easement as well as FSA CREP).
- **Enhance Riparian Habitat:** Plant and seed riparian with native plant mix. Protect plantings by excluding livestock grazing until vegetation has established and is providing bank stability and shade.
- **Enhance Floodplain Connectivity:** Remove channel confinement structures (obliterate draw bottom roads and remove levees along Rock Creek) and activate/construct side channels.
- **Enhance in-stream structural diversity, complexity, and geomorphic stability:** Re-meander channelized stream reaches/re-activate abandoned meandering reaches along Rock and Graves Creek to promote diversity and complexity of habitat types, decrease channel slope, decrease width:depth, and diversify sediment distribution. Install large wood and riffle complexes to provide roughness, overhead cover, and velocity diversity.

- **Reduce streambank erosion rates:** Use bio-engineering techniques, planting/seeding, activation of floodplain, and protection (fencing) of riparian area to facilitate bank stability. Visual assessments indicated that the bulk of the sediment supply is from localized stream bank erosion. Stream bank stabilization may be achieved using several techniques including rest from overgrazing, or physically reshaping some banks and adding native material such as large woody debris (LWD), sedge/rush mats, shrub transplants or other plantings. This should greatly reduce the sediment supply, decrease percentage of fines in the substrate and provide complex habitat.
- **Decrease peak summer temperatures:** Improve/increase channel and floodplain conditions to diversify hyporheic exchange, facilitate vegetative cover/shade, and promote decreased channel width:depth to decrease summer stream temperatures and increase winter temperatures.

A key aspect of the project is to protect habitat from livestock overgrazing and facilitate riparian and wetland vegetation establishment. Approximately 12.4 miles of cattle exclusion fence will be installed, protecting approximately 170 acres of riparian areas under the CTUIR/BPA easement, with approx. 300 acres being protected under the FSA CREP program (13 miles of fence).

Project scope includes a combination of techniques to address habitat limiting factors and facilitate processes and functions that support ecological and life history requirements. The overall scope of the project is currently under development and includes multiple techniques and activities including new channel construction, reactivation of historic meanders and channel segments, reclamation of channelized reaches into functioning floodplains, road and dike removal to reconnect floodplains, side channel development, large wood additions to enhance complexity, riparian floodplain planting, installation/replacement of undersized culverts, and riparian fencing to protect habitat.

Project elements have been incorporated into our concept design that will address habitat limiting factors, including increased lateral complexity of the channel – floodplain surface, increased density and distribution of large wood, and appropriate periodicity and geometry for riffle-run-pool-glide geomorphic units.
The following summary table illustrates BiOp assessment units, CTUIR River Vision Touchstones, BiOp and Recovery Plan limiting factors, goals, objectives, actions, and monitoring, and other activities developed as part of baseline and pre-project planning for the Rock Creek project complex.

TABLE 5 ROCK CREEK SUMMARY TABLE

Project Name	Streams	Year	Assessment Unit steelhead	Assessment Unit Chinook	River Vision Touchstones	BiOP Limiting Factor ID	Snake River Basin Draft Recovery Plan/BiOP Identified Limiting Factors	Eco Concern Sub-Cat ID	Ecological Concern-Sub Category	Project Goals	Project Objectives	Implementation Actions/Metrics	Monitoring Metrics
Rock Creek Fish Habitat Enhancement Project Complex	Rock Cr, Little Rock Cr, Sheep Cr, Graves Cr, Little Graves Cr, Little Whiskey Cr	2013 2016	UGS16	UGC2	Biota-Connectivity	1	Habitat Quantity	1.1	Anthropogenic Barriers	Replace undersized culvert on Graves Creek	**Habitat Quantity:** Replace undersized culvert on Graves Creek. **Protect Habitat:** Develop riparian easement (CTUIR/BPA easement as well as CREP). **Enhance riparian habitat:** Plant and seed riparian with native plant mix. Protect plantings until vegetation has established and is providing bank stability and shade. **Enhance floodplain connectivity:** Remove channel confinement structures (earthen banks) and activate side channels. **Enhance in-stream structural diversity, complexity, and geomorphic stability:** Re-meander channelized stream reaches/re-activate abandoned meandering reaches along Rock and Graves Creek to promote diversity and complexity of habitat types, decrease channel slope, decrease width: depth, and diversify sediment distribution. Install large wood and riffle complexes to provide roughness, overhead cover, and velocity diversity. Protect riparian corridor to allow vegetation to establish. **Reduce streambank erosion rates:** Use bio-engineering techniques, planting/seeding, activation of floodplain, and protection (fencing) of riparian area to facilitate bank stability. **Decrease peak summer temperatures:** Improve/increase vegetative cover/shade to decrease summer stream temperatures and increase winter temperatures.	15 year conservation easement covering 16 miles of streams (approx 450 acres) signed in 2012. 11 miles of in-stream habitat complexity planned. 2 miles of channel construction (Rock Cr). 1 mile of historic channel activation planned (Graves Creek). 2-3 miles of side channel developement 2 miles of abandoned floodplain activation planned. Large wood and riffle/boulder complexes. 1 undersized culvert to be replaced. 4 overflow culverts to be placed. 25.5 miles of riparian fence planned.	**Enhance riparian habitat:** Pre-project snorkel and Spawning data collected. **Enhance floodplain connectivity:** Topography and longitudinal profiles and cross-sections surveyed with Trimble R8 in 2011. **Enhance in-stream structural diversity and complexity:** GPS and record configuration of wood structures, Photo-points. **Decrease width: depth ratios and slope:** Pre-project cross-sections surveyed with Trimble R8 in 2011. Pebble counts taken. **Decrease peak summer temperatures:** Water temperature - hourly data - Hobo Pendant loggers - May to November starting 2011.
					Riparian Vegetation	4	Riparian Condition	4.1	Riparian Condition	Protect Habitat. Subbasin Plan Reference: Habitat Protection (page 258).			
								4.2	LWD Recruitment	Enhance riparian habitat conditions. Subbasin Plan Reference: Riparian Conditions (page 262).			
					Connectivity	5	Peripheral and Transitional Habitats	5.1	Side Channel and Wetland Conditions	Enhance Floodplain Connectivity. Subbasin Plan Reference: Channel Conditions (page 260).			
								5.2	Floodplain Condition				
					Geomorphology	6	Channel Structure and Form	6.1	Bed and Channel Form	Enhance in-stream structural diversity and complexity. Subbasin Plan Reference: Channel Conditions (page 260).			
								6.2	Instream Structural Complexity				
						7	Sediment Conditions	7.1	Decreased Sediment Quantity	Increase suitable spawning gravel recruitment. Subbasin Plan Reference: Sediment Conditions (page 261).			
								7.2	Increased Sediment Quantity	Reduce excessive sediment. Subbasin Plan Reference: Sediment Conditions (page 261).			
					Hydrology	8	Water Quality	8.1	Temperature	Decrease summer peak temperatures. Subbasin Plan Reference: Riparian Conditions (page 262).			
						9	Water Quantity	9.2	Decreased Water Quantity	Increase summer water quantity. Subbasin Plan Reference: Low Flow Conditions (page 263).			

Limiting Factors

1 – Habitat Quantity
- 1.1 Anthropogenic Barriers

4 - Riparian Condition
- 4.1 – Riparian Condition
- 4.2 – LWD Recruitment

5 - Peripheral and Transitional Habitats
- 5.1 – Side Channel and Wetland Condition
- 5.2 – Floodplain Condition

6 - Channel Structure and Form
- 6.1 – Bed and Channel Form
- 6.2 – Instream Structural Complexity

7 - Sediment Conditions
- 7.1 – Decreased Sediment Quantity
- 7.2 – Increased Sediment Quantity

8 – Water Quality
- 8.1 – Temperature

9 – Water Quantity
- 9.2 – Decreased Water Quantity

Project Background

The project was initiated by the landowner and Oregon Department of Forestry (ODF) to address poor access road conditions and legacy forest management issues. Planning efforts expanded into more a comprehensive perspective related to natural resource management and ultimately opportunities to protect and enhance significant riparian, floodplain, and instream habitat for ESA listed Snake River Basin juvenile Chinook salmon and summer steelhead, and resident fishery resources. The landowner enlisted the assistance of the CTUIR, NRCS, and ODF to develop conservation plans for water, fisheries and upland habitat which will ultimately be accomplished through multiple programs, including BPA sponsored fish habitat programs, CREP, EQUIP, and ODF programs.

Existing Conditions

Field surveys and assessment included general field surveys, photographs, collection of historic and current information available for the project (habitat surveys, water temperature data, historic aerial photography), and initiation of detailed morphologic surveys (longitudinal profiles, channel cross section, pebble counts), and collection of topographic data. Additionally, staff conducted presence/absence fish snorkel surveys and adult steelhead redd surveys along project area streams.

Fish habitat has been adversely affected by historic land uses, including livestock overgrazing, road construction, logging, channelization, and utility right of ways. Approximately 3 miles of lower Rock Creek and 1 mile of Graves Creek have been channelized and simplified by draw bottom road construction and installation of levees, resulting in channel incision, increased

channel slope, coarser sediment, and streambank erosion and delivery to downstream reaches. Riparian conditions throughout the project are poor with lack of floodplain connectivity and altered hydrology which, coupled with livestock grazing, is limiting recovery of riparian and wetland vegetation and limiting associated beaver colonization. Current channel conditions are out of balance with the sediment supply and disconnected from the historic floodplain, resulting in channels with high stream energy, little to no spawning gravel, limited velocity refugia, and limited pool habitat.

The closest gage station (station number 13319000) is on the Grande Ronde River at river mile 164 in La Grande. The station has been active since 1904. H.L. Silvey developed regional curve and bank-full discharge estimates for the gage in 1999. The Grande Ronde River stream gage drainage basin area is 678 square miles. Based on a bank-full discharge of 2,750 cfs, a value of 4.06 cfs/mi^2 of drainage area was calculated for the Grande Ronde River. The Rock Creek drainage area is approximately 50.6 square miles giving an estimated bank-full discharge of 205.4 cfs.

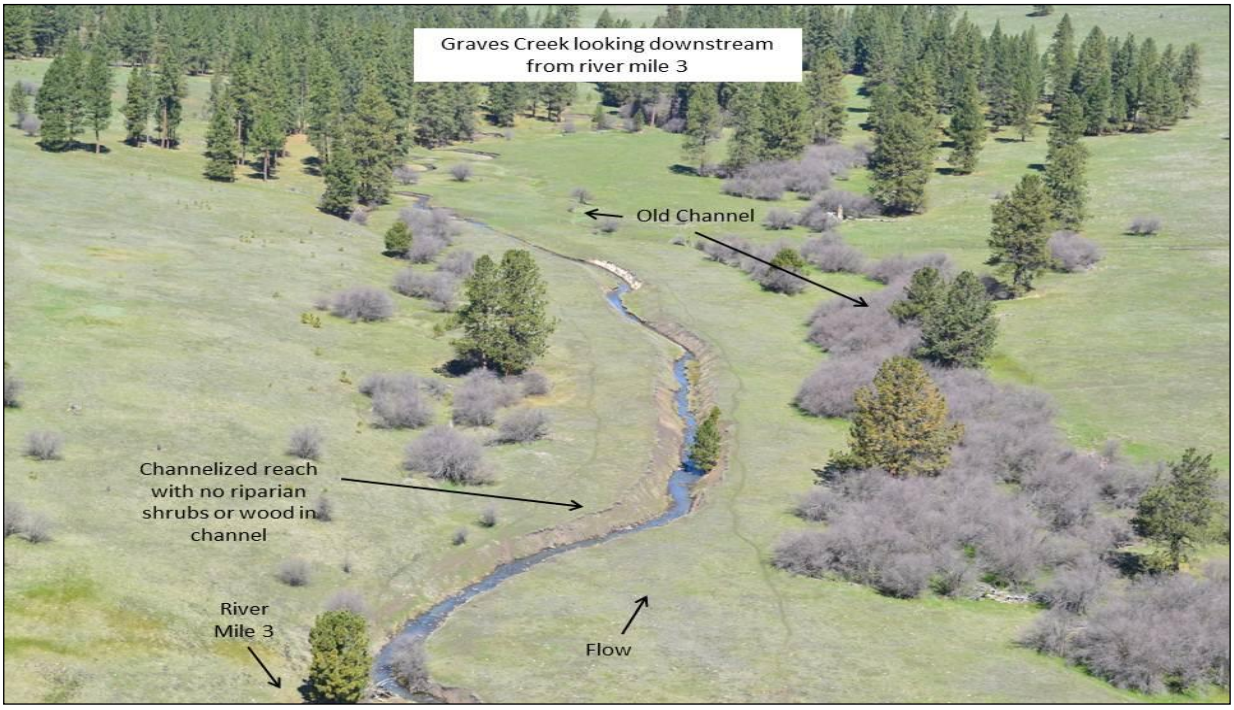
Concurrent with baseline assessments and preliminary planning and design efforts, CTUIR staff successfully negotiated a 15 year term conservation easement encompassing approximately 453 acres and 15.9 miles of fish bearing stream along Rock Creek, Little Rock Creek, Sheep Creek, Graves Creek, Little Graves Creek, and Little Whiskey Creek. Conservation easement planning incorporates the landowner's desire to enroll as much of the project area into the FSA CREP program following completion of fish habitat enhancement efforts. Based on preliminary assessment, it appears that approximately 75% of project area streams will qualify for the CREP program on reaches that contain non -forested soil types.

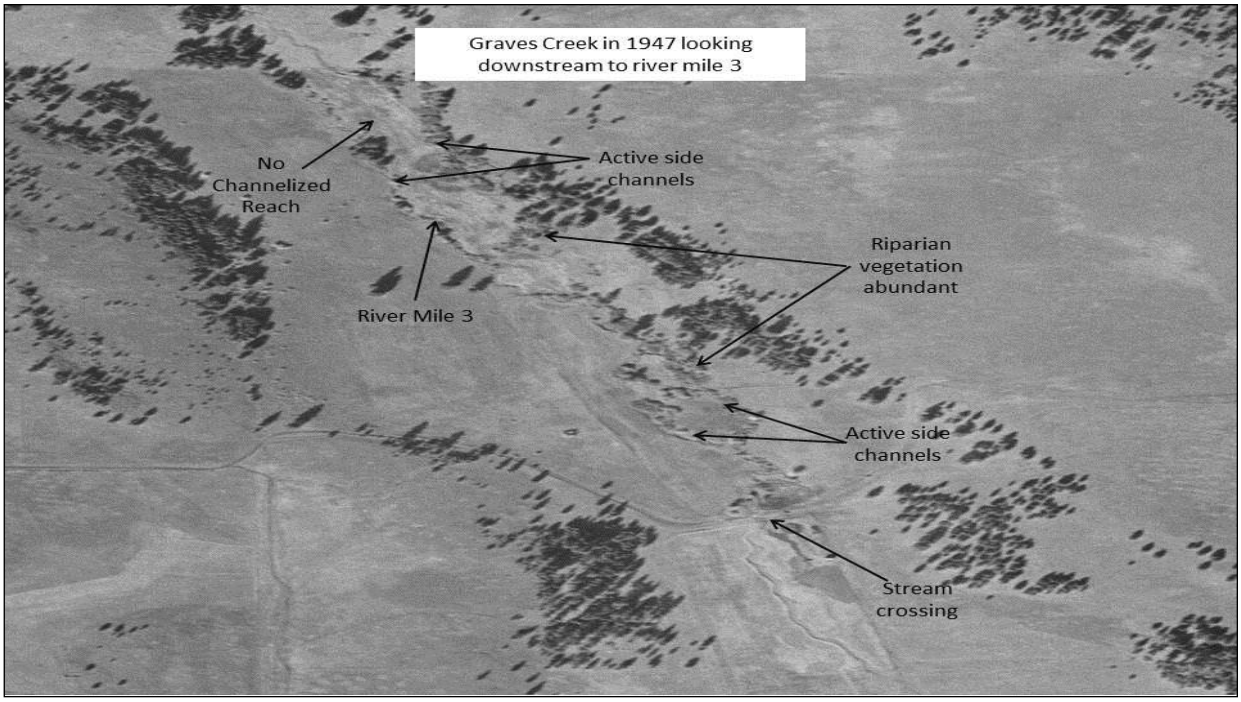
Due to the size and complexity of the project (14.7 miles of fish bearing streams within the Rock Creek drainage), project planning, design, permitting and construction is being phased;

- Phase I - Graves Creek and Little Graves Creek habitat enhancement - implemented during 2013 (funded by Bonneville Power Administration (BPA) through the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) Accords)
- Phase II implementation in 2014 (funded by BPA through the CTUIR Accords and the Grande Ronde Model Watershed (GRMW)
- Phase III scheduled for start in 2015 (CTUIR/GRMW funded).

FIGURE 5 **TWO AERIAL PHOTOGRAPHS OF THE EXISTING CONDITIONS ON ROCK CREEK (UPPER IMAGE IS LOOKING UPSTREAM FROM RIVER MILE 3.5 AT THE CONFLUENCE OF GRAVES CREEK AND ROCK CREEK; LOWER IMAGE IS LOOKING UPSTREAM AT ROCK CREEK FROM RIVER MILE 0.75). NOTE LACK OF RIPARIAN VEGETATION, LACK OF INSTREAM HABITAT COMPLEXITY (LARGE WOOD), CHANNEL CONFINING ROAD, AND SIMPLIFIED CHANNEL.**

FIGURE 6 CONDITION OF GRAVES CREEK IN 2012 (UPPER PHOTO) COMPARED TO 1947 (LOWER PHOTO). LOWER IMAGE SHOWS ABUNDANT RIPARIAN VEGETATION, NO CHANNELIZED REACH AND MULTIPLE ACTIVE SIDE CHANNELS.





Phase I - (Graves Creek Fish Habitat Restoration and Enhancement Project)

Constructed in 2013 and funded by CTUIR/BPA Accord. Phase I consisted of re-activating historic side channels, reconnecting the floodplain, installing riffles to aggrade and stabilize degraded segments along Graves Creek, installing large wood and brush complexes to provide habitat complexity and margin roughness, riparian planting and seeding, and installation of riparian enclosure fences to protect the project area from livestock grazing. The Phase I area is located along 3.8 miles of Graves Creek and 1.4 miles of Little Graves Creek within the "For the Girls LLC" ranch.

The Phase I project area encompasses approximately 144 acres of riparian and was the first step in a larger restoration effort on the ranch that covers a total of 450 acres of riparian habitat. Following the completion of the instream habitat enhancement work the riparian easement will be converted/enrolled into the Farm Service Agency (FSA) CREP program, with the remaining riparian areas that do not qualify for CREP remaining under easement through the CTUIR/BPA. In conjunction with fish habitat and riparian enhancement, off-channel water sources for livestock will be developed on the ranch using a combination of funds from FSA (CREP), NRCS (EQUIP), CTUIR/BPA Accord, and OWEB small grant applications.

Phase II - (Rock Creek Fish Habitat Enhancement Project)

Constructed in 2014 and funded by CTUIR/BPA Accord and the GRMW, approximately 167 large wood complexes were installed along project area streams to enhance instream habitat complexity. Typical wood placement configurations mimicked natural debris accumulations, were designed to stabilize stream banks, and were strategically located within the lower 3rd of existing pools in complexes with 3-5 key member wood pieces per site. These structures will provide shade for fish species, hiding cover from predators, velocity refuge, bank stability, and a food source (from insects). Project designs had 126 wood structures, however, due to cultural resource concerns at some locations wood structures were divided into two or moved from the initial location. The project retained the same number of trees and logs installed (720 whole trees and 239 logs) as originally designed. Boulder clusters were installed at 14 locations to provide habitat complexity, geomorphic stability, and diversity of water depth.

Removal of Floodplain Levees on Rock Creek

Approximately 3,500 cubic yards of levees were removed from the Rock Creek floodplain allowing the re-connection of the stream with its floodplain. The levee material was used to form channel plugs on the channelized reach of Graves Creek.

When hauling levee material, and to address the concerns of four of the utility companies with easements through the property, approximately 800 cubic yards of levee material was used to provide additional cover for buried pipelines and fiber optic cables along the haul routes. This material was then removed after the completion of heavy hauling and taken to the Graves Creek plugs.

Graves Creek Earthen Plugs

Four compacted earthen plugs totaling 3,500 cubic yards of levee material were installed in the channelized reach of Graves Creek and the stream was diverted into its historic meandering channel. There were 3-floodplain ponds created from the channelized section of stream. In

addition, three other side channels were activated along Graves Creek by removing man made earthen plugs. These channels had large woody debris placed in them during the 2013 phase of construction.

Summary of work schedule
Construction work began on 8/11/2014 on Graves Creek with adjustments to large wood installed in 2013 within the area of the channel diversion structure and side channel plugs. This woody material was then re-placed after the entrance to these channels was excavated.

Immediately following the Graves Creek work, the contractor (Hixon Construction) began the removal of levee material and construction of the Graves Creek earthen plugs under the direction of CTUIR staff. The levee hauling continued for 14 days followed by the delivery of large wood to the Rock, Sheep, and Little Rock creek sites. Wood haul took approximately 9 days. The installation of the large wood structures did not directly follow the project designs due to some cultural resource concerns at a number of the sites. This meant that approximately 69 of the sites had excavation restrictions and the wood was therefore not buried into the banks but was instead ballasted with large boulders. Instream work was completed by 10/8/2014 followed by site clean-up and a final inspection.

Fish Salvage Report
Between 7/16/2014 and 8/28/2014 CTUIR Grande Ronde Fish Habitat program and BOR (Bureau of Reclamation) staff, conducted fish salvage operations on Rock Creek between river mile 1.5 and river mile 4.7 as part of the Rock Creek Fish Habitat Restoration Project on the 516 Ranch. This project had the following environmental compliance permits/notifications NMFS Tracking # 2013/9724, USFWS Tracking # 01EOFW00-2013-F-0199, DSL voluntary habitat activities application # 55534-NSP, and U.S. Army Corp of Engineers regional general permit # NWP-2013-269-1.

Salvage Method
By the commencement of salvage operations, the majority of the 167 wood addition sites (86%) did not have standing or flowing water. A total of 13 days of salvage operations were conducted between 7/16/2014 and 8/28/2014 on 24 sites. Fish capture progressed each day until water temperatures reached 18°C. During the trap and haul activity crews determined that several smaller pools adjacent to the salvage areas could potentially dry up before the end of the summer, therefore they included them in their operation and added the metrics to the data sheets.

Salvage operations were conducted using the following protocol –

1. Project biologists snorkeled 12 of the deeper pools within the project area 24hrs prior to salvage operations to determine presence/absence of salmonid species and to estimate their numbers.
2. A block net was installed in larger pools to reduce the movement of fish within the salvage area.
3. Debris and vegetation/algae were removed prior to fish salvage efforts.
4. Release sites were focused in the lower reaches of Rock Creek and the confluence with the Grande Ronde River where there was available cold-water refuge.

5. Capture using seine nets was utilized first (where suitable) followed by electro-fishing.
6. Project biologists recorded:
    a. Salvage area average width, depth, and length in meters –
    b. Water temperature in degrees centigrade (at start and end of salvage passes) –
    c. Number of passes per site –
    d. Fish captured were counted by species –
    e. Type of capture method (seine or electrofishing) was recorded –
    f. When electrofishing the pulse width (nms), frequency (htz), voltage, and the number of seconds on electro-fisher were recorded for each pass.
    g. Salvage operations using electro-fisher were suspended when water temperatures reached >= 18°C.
    h. A site was considered depleted when two consecutive passes were made with zero salmonid species being captured or seen.
    i. Captured fish were placed in aerated coolers and transported to release sites within 10 minutes of capture.
    j. No in-water construction activity commenced until salvage operations were complete.
    k. Any fish mortality was recorded and dead fish retained for inspection by NOAA staff.

Salvage Results

There were 24 sites salvaged during 2014 with no Chinook captured or observed and 2,185 O.mykiss captured. There were 1,864 O.mykiss captured within areas that had wood placement activity (20 sites with ground disturbance within the active channel), and 321 fish captured in areas that did not get disturbed (four sites) see Table 1 for details. Mortality rates for O.mykiss were six fish (0.2%). O.mykiss made up 59.6% of all fish captured (see Table 1 below). The number of passes at each site ranged from 1 to 8 per day with an average of 4 passes per site to reach depletion. The density of O.mykiss salvaged was calculated as 2.67 fish/m^2, which was higher than density estimates derived from snorkel surveys and higher than Catherine Creek salvage in 2013 and 2014 (see Table 2).

TABLE 6 NUMBER OF FISH CAPTURED BY SPECIES AND PERCENT OF TOTAL CAPTURED DURING 2014 SALVAGE OPERATIONS ON ROCK CREEK (RIVER MILE 1.2 TO 4.3)

Rock Creek 2014 Fish Salvage CTUIR		
Species	Number salvaged	% of total
Chinook	0	0.0
O.mykiss	2185	59.6
Sucker	364	9.9
Dace	212	5.8
Sculpin	321	8.8
Pikeminnow	460	12.6
Shiner	122	3.3
Total	3664	
n=24 sites		

TABLE 7 COMPARISONS OF *O.MYKISS* DENSITIES FOR ROCK CREEK BASED ON SNORKEL SURVEY ESTIMATES AND SALVAGE DATA. TABLE ALSO HAS A COMPARISON WITH SALVAGE DATA FROM CATHERINE CREEK IN 2013 AND 2014

O.mykiss density estimates per square meter for Rock Creek and Catherine Creek

Method	O.mykiss/m^2	total area sampled (m^2)	total O.mykiss seen during snorkel survey or captured during salvaged	# of pools sampled
2011 snorkel Rock Creek	0.30	2,205.50	839	62
2012 snorkel Rock Creek	0.10	2,289.50	295	69
2014 salvage Rock Creek	2.67	818.33	2,185	24
2013 salvage Catherine Creek	1.00	295.8	298	5
2014 salvage Catherine Creek	0.30	3,690.07	1216	24

Data based off fish seen during snorkel surveys (2011 and 2012) on Rock Creek and from salvage (electro-fishing/sein 2014) on both Rock Creek and the Catherine Creek CC44 Phase I & II project. Data may not be for the same pools each year on Rock Creek due to seasonal changes in water elevations, but are for the same reaches (i.e. from the bridge by the cabin to the most upstream property boundary – river miles 1.5 to 4.9).

Capture by seine net accounted for 31% of all *O.mykiss* (679 fish) and 21.9% of the total fish captured (including *O.mykiss*). Combining salvage data for all sites gives 137 passes taken to

capture 2,185 *O.mykiss* with 22 of these passes using seine nets compared to 115 passes with the electro-fisher method. Mortality of *O.mykiss* using sein nets was one fish (0.04% of *O.mykiss* captured). See Table 3 for details of fish numbers broken down by capture method. There were approximately 2.3 *O.mykiss*/minute captured using sein nets compared to one *O.mykiss*/minute for electro-fishing. Typically, the number of *O.mykiss* captured per pass varied from site to site, with a range of 1 to 53 fish and an average of 18 fish per pass for electro-fishing and a range of 0 to 102 fish with an average of 35 fish per pass for seine netting.

TABLE 8: COMPARISON OF CAPTURE METHOD AND NUMBER OF FISH CAPTURED ON THE ROCK CREEK PROJECT DURING 2014

Rock Creek Fish Salvage 2014 Number of Fish by Method of Capture							
Salvage method	**# O.mykiss**	**# Suckers**	**# Dace**	**# Sculpin**	**# Pikem innow**	**# Shiner**	**O.my kiss Morts**
electro	1506	309	173	314	443	117	5
sein	679	55	39	7	17	5	1
Grand Total	**2185**	**364**	**212**	**321**	**460**	**122**	**6**
electro %	69%	85%	82%	98%	96%	96%	0.33%
sein %	31%	15%	18%	2%	4%	4%	0.04%

Salvage Discussion

Seine netting is the preferred method of capture compared to electro-fishing and produced more *O.mykiss* captured per minute of activity than electro-fishing (2.3 fish/minute compared to 1 fish/minute). However, crews were only able to deplete five of the 24 sites using seine netting alone and had an average of 2 passes per site with the seine nets at other sites. Fourteen sites were not suitable for netting due to low water levels, small pool size, dense vegetation, or large substrate. At some sites electro-fishing was the only capture method used and averaged six passes per site to reach depletion (depletion being two passes with no salmonid species seen or captured).

The densities of *O.mykiss* per square meter captured during this salvage operation were considerably higher than that estimated from our snorkel surveys. However, it should be noted that during the snorkel surveys the wetted channel covered a larger area, with pools still being connected to each other by riffles and glides, making it difficult to enumerate fish in water too shallow to snorkel. In contrast, during the salvage effort, all pools were isolated and fish were concentrated into small pockets of rapidly diminishing habitat.

The speed at which Rock Creek dried up during 2014 was a surprise to the landowner, ranch operator, and the project biologists. During the first week of July, the CTUIR biologists were discussing the difficulties of work area isolation and turbidity management given the amount of water within the project area. However, by mid-July at the start of salvage operations, the water levels were already dropping and most sites were isolated with no connecting flows. By early August, large sections of the channel had become dry including areas that the landowner had not

seen dry before (Figure 9). This meant there were 20 wood sites out of the 167 installed that required fish salvage and a further four that crews salvaged that were in close proximity to disturbed areas and had stranded fish.

FIGURE 7 SETTING UP BLOCK NETS ON THE LARGEST POOL SALVAGED IN 2014 ON ROCK CREEK.

FIGURE 8 DRY CHANNEL ON UPPER ROCK CREEK

FIGURE 9 **USING A SNORKELER TO HERD FISH INTO THE SEINE NET. THIS POOL PRODUCED 481 *O.MYKISS* AND 55 OTHER FISH (WITH 133 FISH CAUGHT USING THE SEINE NET)**

FIGURE 10 **CREWS HAD TO START AT 5AM AND HAD GENERALLY REACHED 18°C BY 10AM. SOME SITES HAD OVERHANGING VEGETATION THAT MADE SEINE NETTING DIFFICULT.**

FIGURE 11 BY MID-JULY SALVAGE CREWS OBSERVED NUMEROUS DRIED OUT POOLS ALONG ROCK CREEK WITH DEAD O. MYKISS.

Turbidity Monitoring Report

As discussed above during 2014 Rock Creek became dry in most of the areas where work occurred within the ordinary high water mark. Those areas of disturbance that remained wet (20 sites) had no flowing water, therefore there was no stream turbidity measurements taken.

Riparian Vegetation Planting

Following the completion of ground disturbing activity and site cleanup on October 8 2014, CTUIR crews began seeding and harrowing the disturbed riparian areas at 10lbs.seed /acre (see Table 4 for seed mix).

Approximately 7,000 potted plants grown by the CTUIR Native Plant Nursery were installed in the project area. The plant species grown by the nursery has been selected from known plants within the Rock Creek Basin (see Table 5). Plants were then protected from livestock grazing with barbed wire riparian fences.

In addition to the potted plants, approximately 1,500 willow whips were planted in and around the large wood structures. These plants were harvested from the confluence of Rock Creek and the Grande Ronde River with permission from Oregon State Parks and were a mixture of Coyote and McKenzie Willows.

Project Monitoring

The CTUIR Grande Ronde Fish Habitat Project has conducted water temperature monitoring within the project area since 2010 and will continue to do so until the end of the current riparian easement expires (2026). Morphological surveys were conducted in 2011/2012 and will be repeated at a 3 to 5 year intervals post-construction. These surveys included a longitudinal profile, cross sections and pebble counts. Photo-points and as built photos of wood sites will be repeated at 3 year intervals. Presence/absence spawning and snorkel surveys will be repeated during the first spring/summer after construction.

CTUIR Fish research, CRITFC and ODFW will continue monitoring the 4 CHaMP sites within the lower 4.5 miles of Rock Creek as directed by the CHaMP protocol.

TABLE 9 SEED MIX FOR ROCK CREEK RIPARIAN CORRIDOR

Riparian Seed Mix for Rock Creek 2014	
Common Name	% of mix
Tufted Hairgrass	10.21
Idaho Fescue	19.89
Bluebunch Wheatgrass	10.11
Blue Wildrye	22.02
Sherman Big Bluegrass	13.71
Basin Wildrye	16.33
Small fruited bulrush	4
inert material	3.73

TABLE 10 NATIVE PLANT LIST FOR ROCK CREEK PROJECT

Common Name	**Scientific Name**	**Size/Stock**	**Quantity**
Black Cottonwood	Populus trichocarpa	4" x 14" Tall Pots	2,600
Red-Osier Dogwood	Cornus sericea	4" x 14" Tall Pots	2,000
Red Alder	Alnus rubra	4" x 14" Tall Pots	1,000
Black Hawthorne	Crataegus douglasii	4" x 14" Tall Pots	700
Water Birch	Betula occidentalis	4" x 14" Tall Pots	400
Blue Elderberry	Sambucus cerulea	4" x 14" Tall Pots	250
Mockorange	Philadelphus lewisii	4" x 14" Tall Pots	250
Golden Currant	Ribes aureum	4" x 14" Tall Pots	200
Chokecherry	Prunus virginiana	4" x 14" Tall Pots	200
Common Snowberry	Symphoricarpos albus	4" x 14" Tall Pots	200
Willow Species	Salix spp	4' whips	1,500
		Total	**9,300**

FIGURE 12 LARGE WOOD LOCATIONS STATIONS, 70+00-109+00.

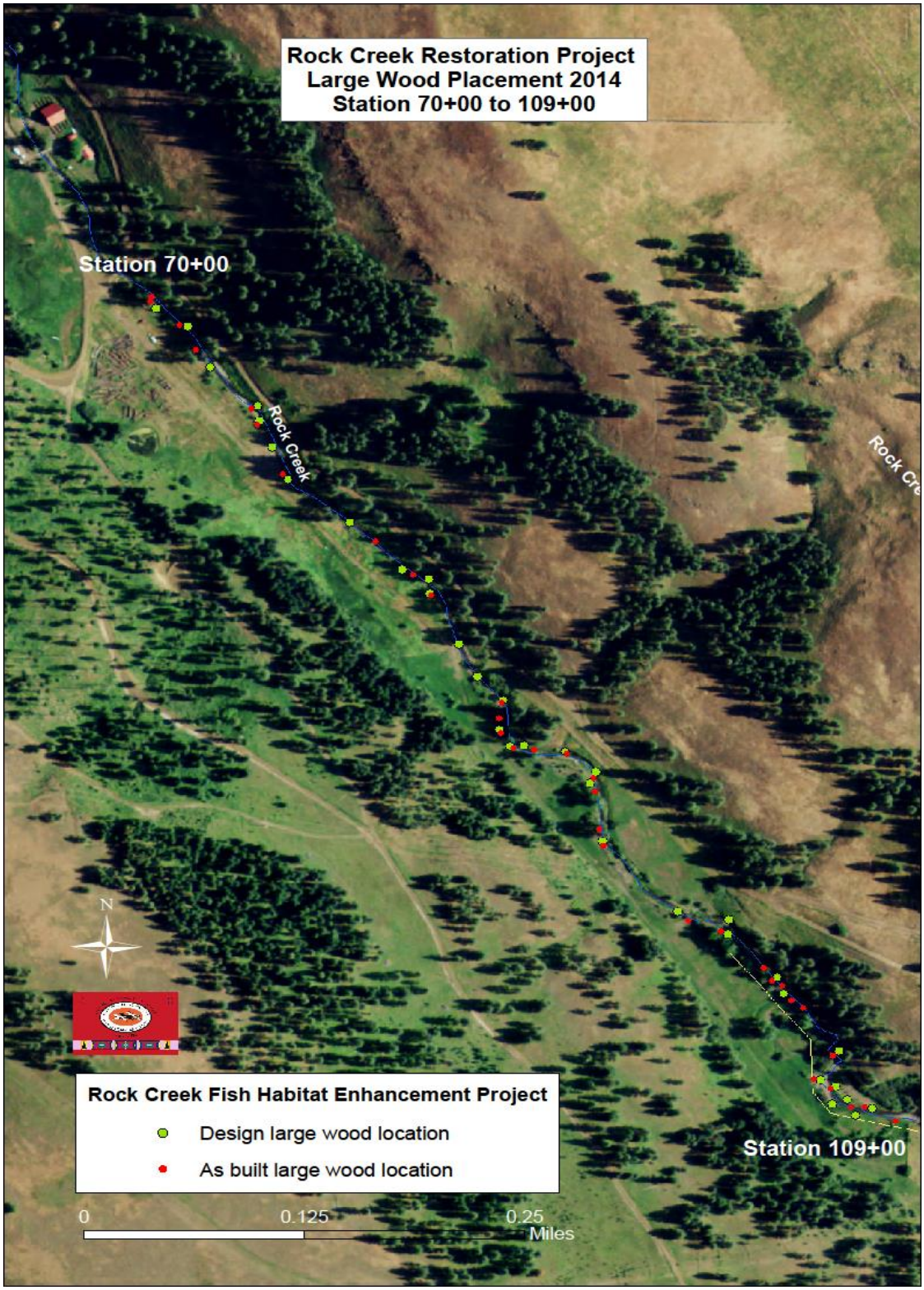


FIGURE 13 LARGE WOOD LOCATIONS, STATIONS 109+00-157+00.

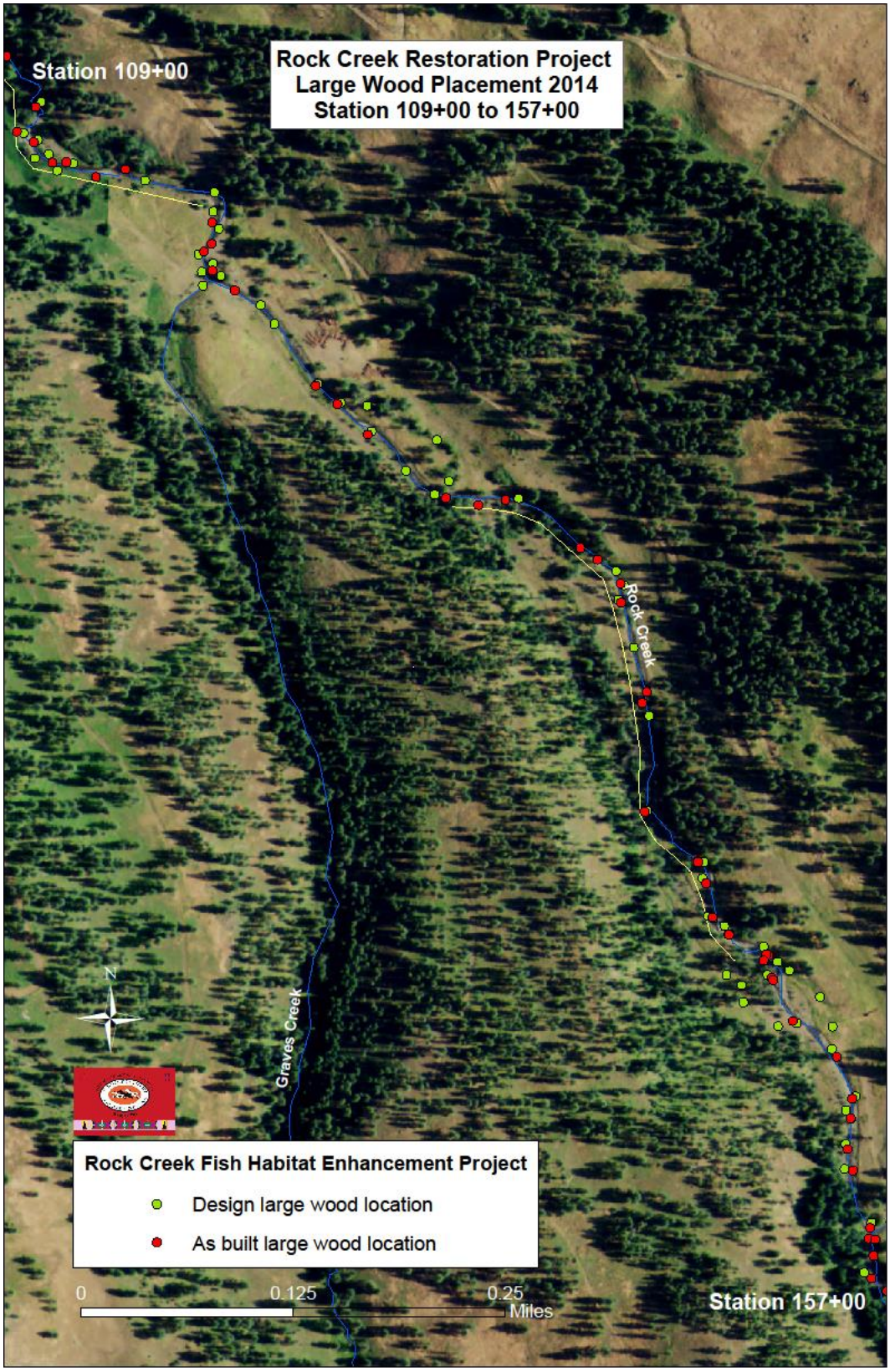


FIGURE 14 LARGE WOOD LOCATIONS STATION 157+00-214+00.

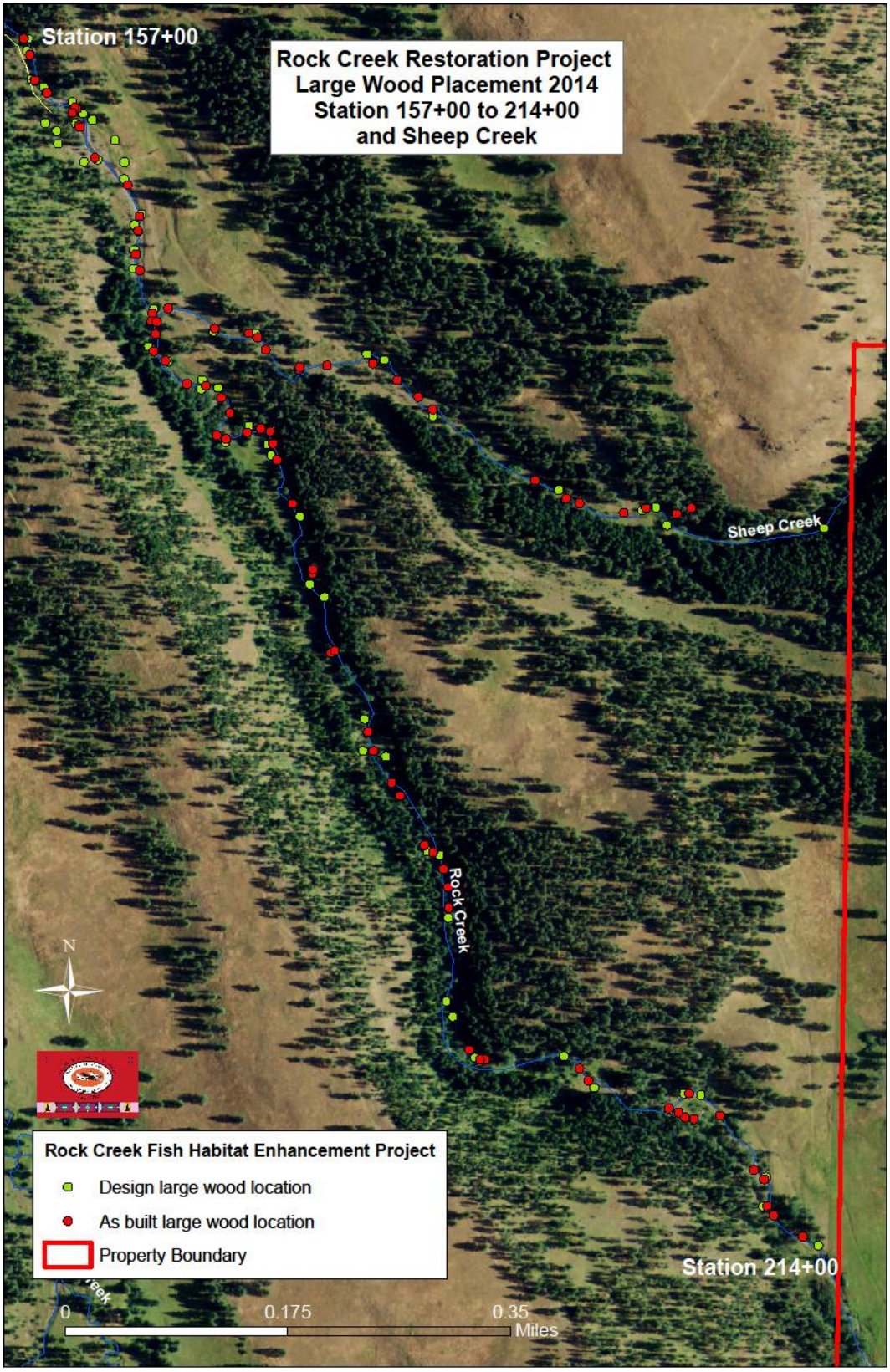


FIGURE 15 LARGE WOOD LOCATIONS STATION 236+75-260+25.

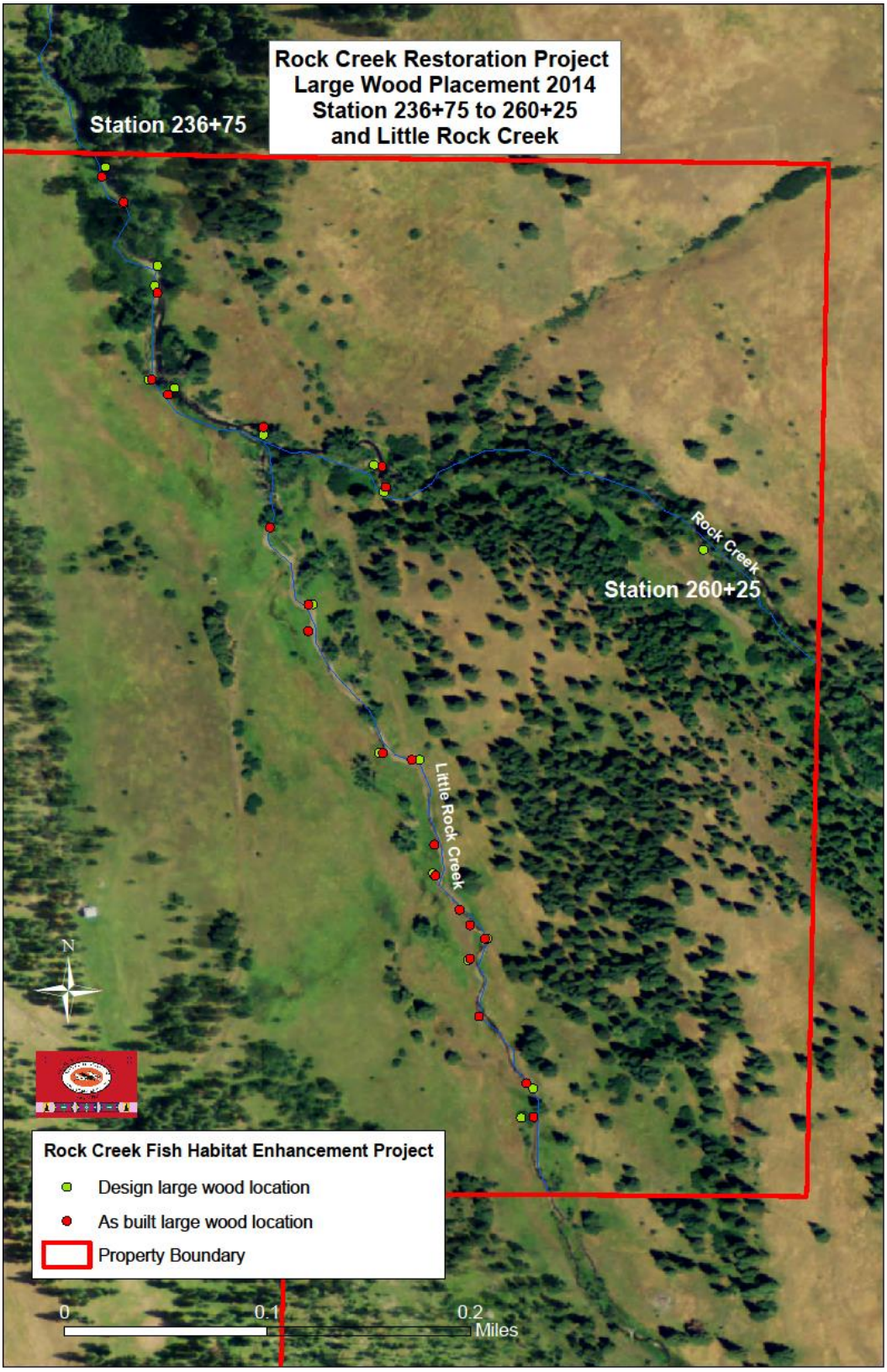


FIGURE 16 ROCK CREEK FISH SALVAGE LOCATIONS-LOWER ROCK CREEK.

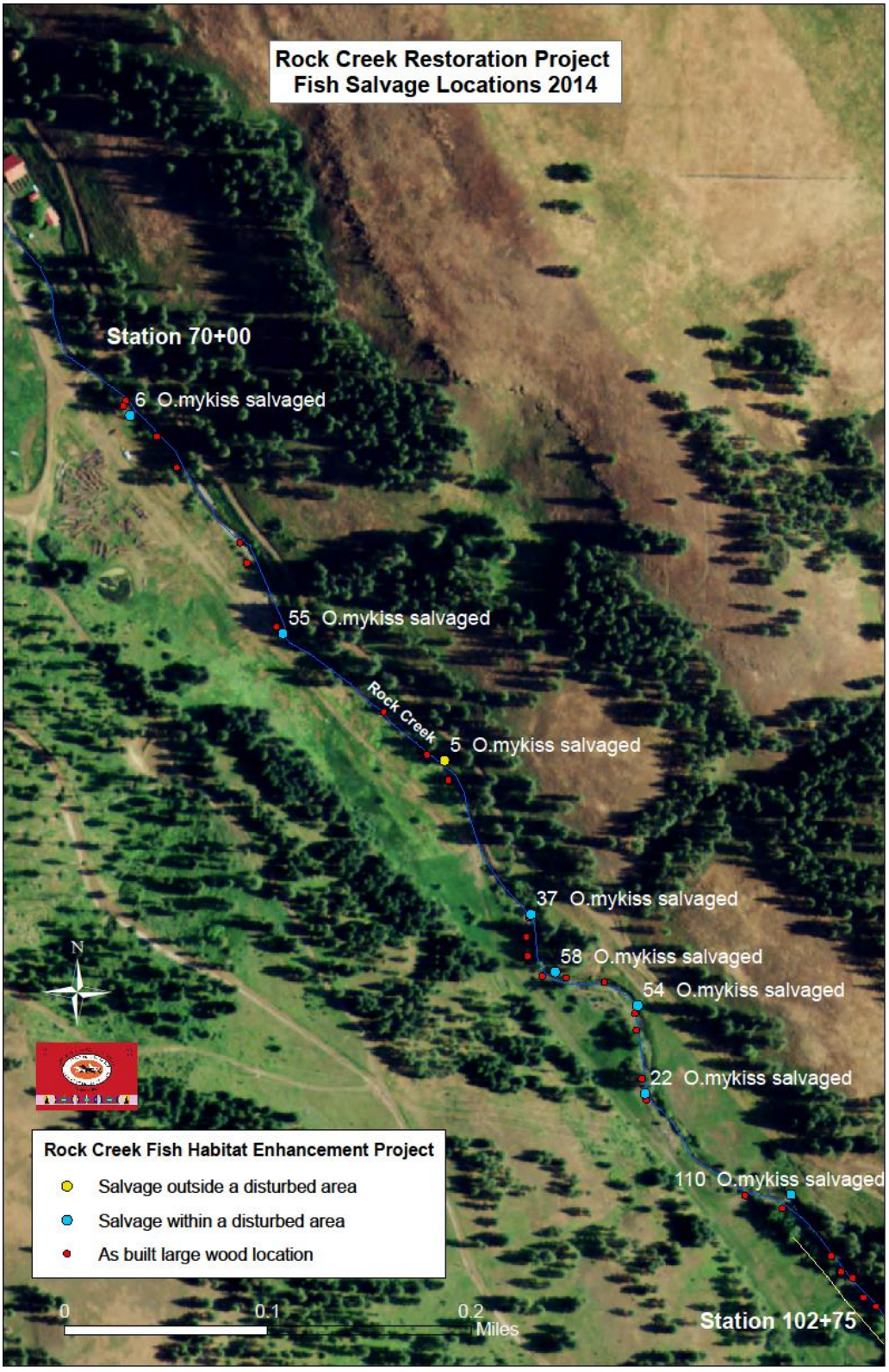


FIGURE 17 ROCK CREEK FISH SALVAGE LOCATIONS-GRAVES CREEK CONFLUENCE.

FIGURE 18 ROCK CREEK FISH SALVAGE LOCATIONS-ABOVE SHEEP CREEK.

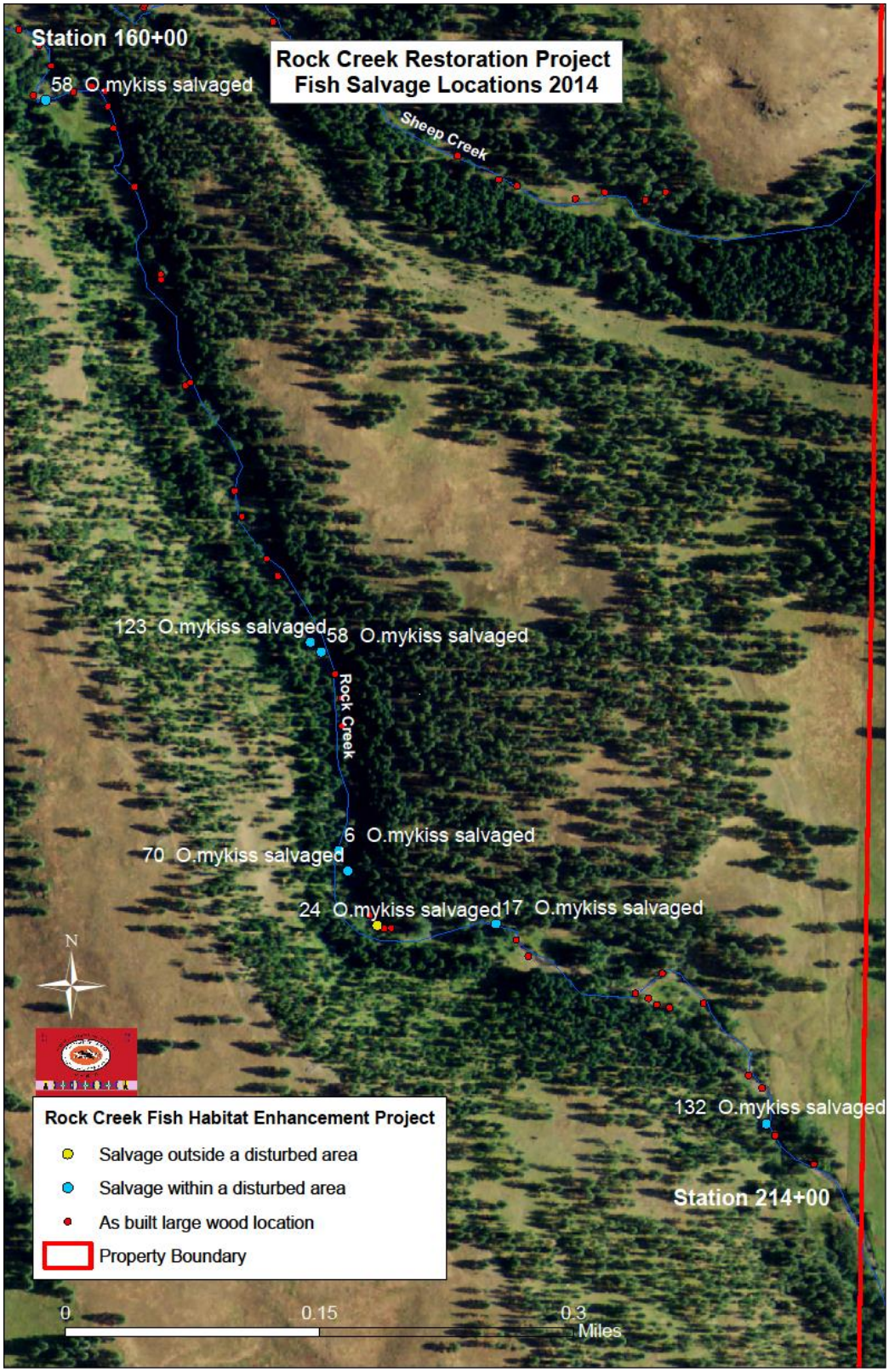


FIGURE 19 ROCK CREEK FISH SALVAGE LOCATIONS-UPPER ROCK CREEK.

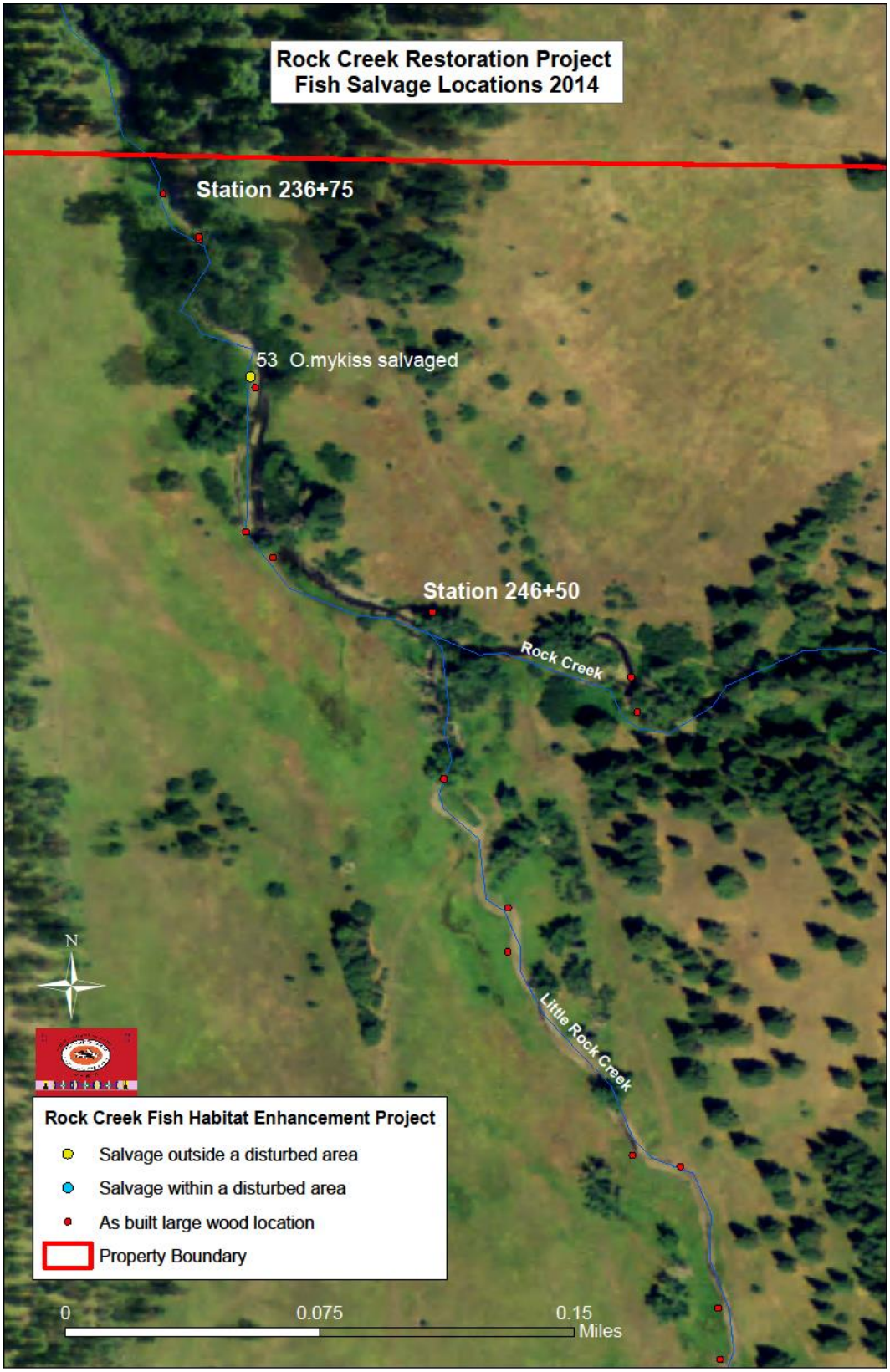


FIGURE 20 POST CONSTRUCTION WOOD ADDITION SITE ON THE LARGEST POOL WITHIN THE PROJECT AREA, (UPPER PHOTO) AND ERODING BANKS AT SAME LOCATION PRE PROJECT (LOWER PHOTO).

FIGURE 21 ONE OF THE PLUGS ALONG THE CHANNELIZED REACH OF GRAVES CREEK MADE FROM LEVEE MATERIAL REMOVED FROM THE ROCK CREEK FLOODPLAIN. TOP PHOTO WAS TAKEN LOOKING UPSTREAM IN 2013 AND BOTTOM PHOTO WAS TAKEN IN DECEMBER 2014 – 3 MONTHS AFTER CONSTRUCTION OF THE PLUG.

FIGURE 22 THE ENTRANCE TO THE HISTORIC CHANNEL OF GRAVES CREEK IN 2013 (TOP PHOTO) AND IN 2014, THREE MONTHS POST CONSTRUCTION (BOTTOM PHOTO).

CC44 Phase II Fish Salvage 2014

From July 21 to August 12, 2014, fish salvage operations were conducted on Phase II of the Catherine Creek 44 (River mile 44) Fish Habitat Enhancement Project by staff from CTUIR, ODFW, BOR, UCSWCD, and the Grande Ronde Model Watershed (Figure 1). Salvage operations were conducted on sites that had been isolated from the main channel of Catherine Creek in preparation for channel and engineered large wood structure construction. Sites were isolated by placing large sandbags around the perimeter of the site and allowing an opening at the downstream end of the site, which was then blocked by a seine net on the day of the salvage. A total of 22 large wood sites, 2 alcove sites, and 1 roughened channel site were salvaged using Smith-Root electrofishers and beach seines. The National Marine Fisheries Service "Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act" document was used as a guideline for salvage.

Salvage work was generally done in the morning when stream temperatures were less than 18º C, and most sites were salvaged until depletion was achieved or temperatures reach 18º C. Sites were considered depleted when 2 consecutive passes with the electrofisher were made with zero salmonid spp. captured on each pass. The number of passes that each site needed to reach depletion (using both sein nets and/or electro-fisher) ranged from a minimum of 6 passes in one day to a maximum of 22 in one day (at site 22 – station # 75+00) with an average of 8 passes per site needed to attain depletion.

TABLE 11 TOTAL NUMBERS OF SALVAGED FISH-CC44

Site Type	Chinook	O. mykiss	Sucker	Dace	Sculpin	Shiner	Pikeminnow
Large Wood Sites	165	788	1	171	420	1	74
Roughened Channel	181	409	0	493	244	1	28
Alcove sites	11	78	0	6	21	0	1
Total	**357**	**1275**	**1**	**670**	**685**	**2**	**103**
% of total	**11.5%**	**41.3%**	**0.03%**	**21.6%**	**22.1%**	**0.06%**	**3.3%**

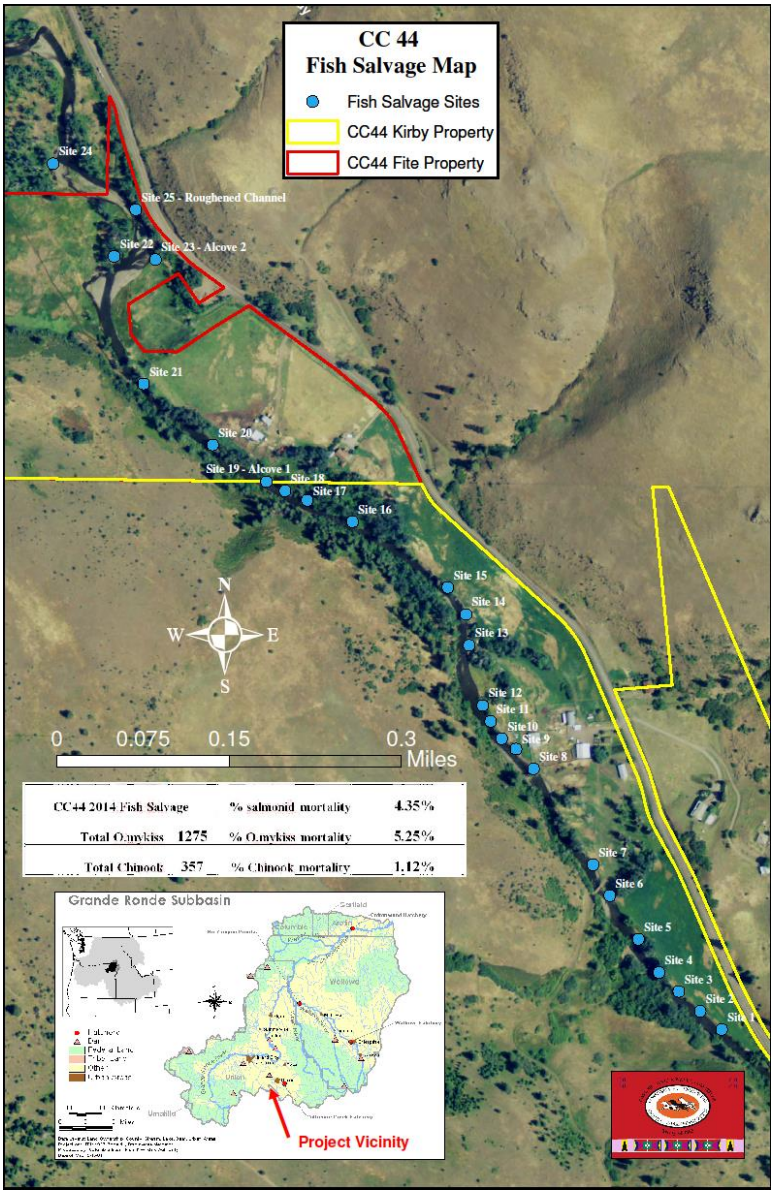
Discussion

Overall, the CC 44 Phase II salvage operation was successful in depleting construction sites and relocating 1,632 ESA listed salmonids into the active channel. Salmonid species made up 52% of the 3,093 fish caught. However, a relatively high mortality rate of juvenile O. mykiss (20-30mm young-of-the-year) was encountered during salvage operations (5.25%), which was above the 5 % expected in the Biological Opinion (BO) and was higher than that of Chinook (1.12%). See table below:

TABLE 12 SALMONID MORTALITIES-CC44

CC44 2014 Fish Salvage		**% salmonid morts**	**4.35%**
Total O.mykiss	1275	% O.mykiss morts	5.25%
Total Chinook	357	% Chinook morts	1.12%

FIGURE 23 FISH SALVAGE MAP



Mortality Rates

Mortality was not consistent between sites, with 48% of the 25 sites having no mortalities and rates do not appear to be directly correlated to the number of passes per site. For example: a site with only 2 passes resulted in 13 mortalities (the Roughened Channel) compared with site # 22 which had 22 passes in one day for only 2 mortalities. Site # 22 had the second largest number of salmonid species captured with 196 fish and had 6 mortalities total (a rate of 3%) compared to the largest fish capture area – the Roughened Channel – with 590 salmonids captured and 38 mortalities (a rate of 6.4%). Yet site # 22 had 29 passes over 2 days compared to 13 passes over 3 days for the Roughened Channel.

Several factors likely contributed to the high mortality:

- The majority of the O. mykiss captured were recently hatched young-of-the-year measuring 20-30 mm.
    - These fish were notably smaller than those young-of-the-year salvaged on Rock Creek in 2014, and may have been affected to a greater degree by the electric current.
- The habitat salvaged was along the stream margins consisting mostly of cobble substrate; YOY O. mykiss were able to escape capture by burrowing in the interstitial spaces of the cobble. (Figure 2).
    - A combination of substrate size/composition, and isolated area conditions meant the majority of salvaging was conducted using electro-fishing techniques with 1,589 salmonids capture using this method compared to 43 using sein nets.
- Salvage crews noted that during work area isolation heavy equipment had tracked through several of the isolated areas and the mortalities were predominantly from crushing.
    - There were no indication on mortalities of banding or spinal injury which would have been consistent with fish coming into contact with the anode.
- For the Roughened Channel:
    - The shallow depth of some of the sites (a mean depth of .2m) may have contributed to higher water conductivity when the site was electro shocked.
    - The length of the site (129m) may have contributed by allowing fish to evade the salvage crews, increasing the likelihood of multiple shocks and/or crushing.

Fish Capture

The number of passes needed per site to reach depletion was not a function of the number of fish captured, for example: site # 14 took 14 passes over 2 days to capture 15 salmonids with zero mortality and site # 24 took 21 passes over 2 days to capture 150 salmonids with 1 mortality. The numbers of salmonid species captured at each site was also highly variable and ranged from 0.07 fish/m^2 to 1.95 fish/m^2 (for site 4 and site 22 respectively), with an average of 0.47 fish/m^2 for 24 sites (site # 23 did not have any length, width, and depth measurements recorded). The average depth of a site was not an indicator as to the number of fish captured.

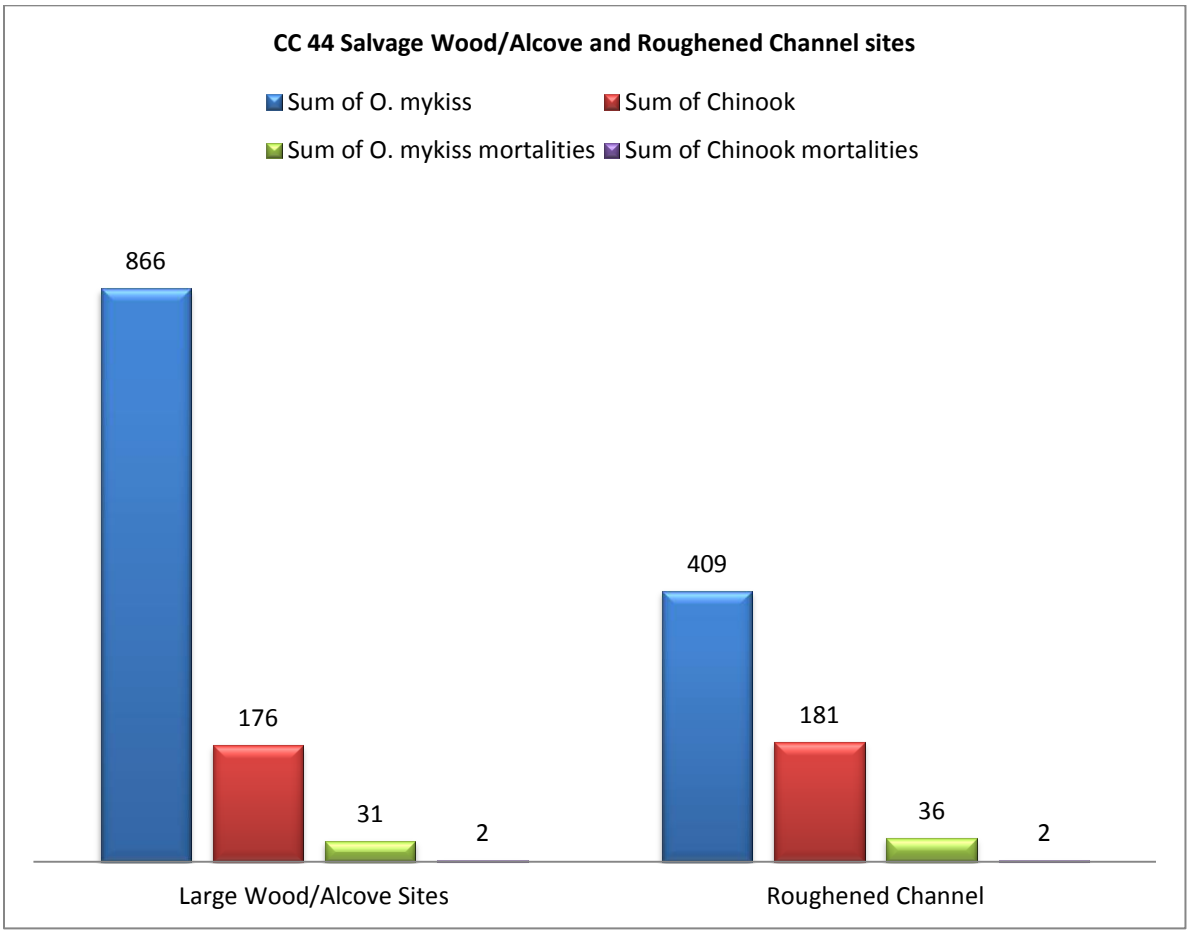
FIGURE 24 CREWS SALVAGING ROUGHENED CHANNEL. NOTE LARGE SUBSTRATE AND SHALLOW DEPTH.

Lessons Learned

The small size of the juvenile O. mykiss, the large cobble substrate, the shallow depth, and the large site sizes made salvaging difficult and could have contributed to high O. mykiss mortality. Similar salvage sites in the future may have lower fish mortalities if certain precautions are made:

1. On sites with large substrate that provide concealment areas for small fish, crew size should be minimal. This would prevent fish from being stepped on or crushed between rocks.
2. Long sites or sites with varying habitat types should be split into sections. This would help prevent fish from being shocked more than once.
3. Allow greater time to conduct the salvage operation.
    a. On large sites, fish salvage may need to be conducted over a period of several days. This would allow concealed fish time to return to areas where they might be easier to capture.
    b. The roughened channel site was salvaged for a 3rd time with 1 pass on 7/30/2014 (after construction on the site began) due to fish being observed by one of the Biologists. This 3rd salvage captured 32 *O. mykiss* and 2 Chinook and had zero mortalities.
4. Work area isolation should be done in a way that minimizes stream bed disturbance within the isolated area.
5. Ensure areas are truly isolated and cannot be re-populated by fish from the main channel.
    a. Salvage crews noted fish moving between the sand bags and on several occasions continued their operations after two zero passes due to fish being observed.

FIGURE 25 CC44 MORTALITIES AT WOOD/ALCOVE AND ROUGHENED CHANNEL SITES.



Catherine Creek Freshwater Mussel Salvage and Relocation

On July 21, 2014 CTUIR DNR Freshwater Mussel Project biologist Alexa Maine surveyed 9 separate sites on Catherine Creek. 7 sites were isolated from the main channel with large sand bags and tarps in preparation for placement of large woody debris; the 8th and 9th sites were in the roughened channel stretch of the creek, downstream from the isolated sites. In sites 1-7 a total of 19 mussels were located and collected via snorkel and viewing bucket, all were *Margaritifera falcata* ranging in size from less than 1" to approximately 3" in length. Those mussels were transported from the isolation sites to a relocation site at Catherine Creek State Park. The relocation site was chosen based on observation of existing mussels, as well as ease of future access for monitoring.

Site 8 was an area determined to be the site of future in-stream construction work. The area above and below the construction site was surveyed via snorkel and viewing bucket (approximate total length of the reach was 15 meters). No mussels were found in the specific construction area, but two beds of *M. falcata* were observed downstream of this area. No mussels were collected or relocated from this site.

Site 9 was within the roughened channel, involving in-stream and stream bank work. The area surveyed was approximately 30 meters in length and 10 meters wide on average. This site, in addition to the main Catherine Creek channel, contained a side channel area with a slower moving, but connected, water body. Site 9 was surveyed for approximately 45 minutes via snorkel and viewing bucket. Two *M. falcata* mussels were found on the right bank (facing downstream) directly behind a large boulder, in some sand and small-sized gravel. These two mussels were collected, and immediately relocated to one of the existing beds upstream of the roughened channel site (near site 8). At site 9, the flow at the middle of the channel was too swift and deep for safe and accurate surveying so it was not included in the survey. The slower water area was surveyed, no mussels were observed in this area.

Start time for the first 1-6 sites was 6:45 am, finished collecting and transport started at 9:00 am.
Temperature when starting was 58 F, with overcast skies.
Start time for sites 8 and 9 was 9:20 am, finished collecting and relocating at 10:40 am.
Temperature when starting was 60 F, with overcast skies.
Start time for site 7 was 10:50 am, finished collecting and transport started at 11:30 am.
Temperature when starting was 60 F, with overcast skies.

Relocation site:
Catherine Creek State Park, entry to creek is directly adjacent to campsite #2. The exact location of the relocation site is shown in the pictures below. The specific relocation site is approximately ½ meter off the right bank (facing downstream), mussels were placed in sand near existing mussels (see figure 28).

FIGURE 26 5 MUSSELS CAN BE SEEN IN THIS IMAGE. THE 3 IN THE CENTER OF THE FRAME ARE RELOCATED INDIVIDUALS. THE 2 SEEN IN THE UPPER AND LEFT OF THE FRAME ARE EXISTING MUSSELS ALREADY IN PLACE AT THE RELOCATION SITE.

All 19 mussels collected from sites 1-7 were placed at this relocation site. They were transported directly after collection of sites 1-6. During the collection of each additional site, mussels that had been collected from previous sites were held together in a mesh bag placed in the creek. The mussels were transported in the mesh bag inside a bucket of water. The holding time for the mussels (starting from the first mussel collected) was less than one hour. Site 7 was sampled after sites 8 and 9 due to fish salvage work at site 7. Mussels collected from site 7 were transported immediately after the completion of the survey, and relocated at the Catherine Creek State Park site.

Site Details

Site #1, isolated channel—5 mussels collected
Site #2, isolated channel—5 mussels collected
Site #3, isolated channel—2 mussels collected
Site #4, isolated channel—1 mussel collected
Site #5, isolated channel—0 mussels collected
Site # 6, isolated channel—0 mussels collected
Site #7, isolated channel—6 mussels collected
Site #8, site of future in-stream work—0 mussels collected, bed observed downstream of construction area
Site #9, roughened channel site—2 mussels collected

Margaritifera falcata was the only mussel species observed during the survey. Most of the mussels were exposed, not buried in the sediment. Some were buried but only approximately

20% of the shell was covered. One mussel was crushed slightly, was still alive when relocated, but one valve had a significant crack/crush injury. This mussel was less than 1" in length and can be seen in the far right of figure 2.

FIGURE 27 MUSSELS COLLECTED DURING THE CATHERINE CREEK MUSSEL SALVAGE.

FIGURE 28 RED BOX INDICATES AREA OF RELOCATED MUSSELS AT CATHERINE CREEK STATE PARK.

Ongoing Work Elements

The following sections present work elements followed by discussion of accomplishments for the project during the contract period.

Manage and Administer Projects

This work element includes a suite of management actions required to administer the project, including preparation of annual operations and maintenance budgets, managing and preparing statements of work and budgets, and milestone and metrics reporting in Pisces, supervising and directing staff activities, conducting vehicle and equipment maintenance and management, payroll, purchasing, subcontracting for services, and administering/inspecting habitat enhancement activities. CTUIR staff administered the Rock Creek Phase 2 Project and assisted with the Catherine Creek CC44 Project, including construction subcontract solicitation, field stakeout, and observation and inspection. CTUIR administered all aspects of construction subcontracting, materials acquisition, and administration for the Rock Creek Project during 2014.

The Project Leader supervised 3 permanent employees and a seasonal crew of 3 90-day e-hire employees to accomplish fish salvage and riparian planting project activities. Staff training included 2014 River Restoration Northwest Symposium (Project Leader and Assistants).

Environmental Compliance and Permits

Environmental compliance methods include development of appropriate documentation under various federal and state laws and regulations governing federally funded project work. Methods involve coordination with various federal and state agencies and development, oversight, and submittal of permit applications, biological assessments, cultural resource surveys, etc.

Primary accomplishments during the reporting period included coordination with BPA environmental compliance personnel to prepare supplemental documentation and reporting for ongoing and planned management actions.

Additionally, CTUIR staff initiated preliminary EC compliance on projects planned for implementation beginning in 2014 including the Rock Creek Project Phase III and Bird Track Springs Floodplain roughness Project. Activities included preparation of maps illustrating the Area of Potential Effect (APE) to initiate cultural resource investigations and compilation of ESA species information for incorporation into ESA compliance documentation. EC compliance activities will be ongoing for the Rock Creek Project III in FY2014 with completion scheduled for late summer in preparation to construction initiation.

Coordination and Public Outreach/Education

Coordination and public education were undertaken to facilitate development of habitat restoration and enhancement on private lands, participate in subbasin planning, ESA recovery planning, BiOp/Remand project development and selection processes, and assist with providing watershed restoration education. CTUIR technical staff coordinates through the GRMW on the Board of Directors and Technical Committee to help facilitate development of management

policies and strategies, project development, project selection, and priorities for available funding resources.

The Project Biologist participates in multiple basin programs and processes associated with project prioritization and selection, funding, and technical review. Focus during FY2014 included work on the Catherine Creek Atlas process, initiation of the Upper Grande Ronde Atlas, and participation on the GRMW technical review team to evaluate and select projects for funding recommendations through the GRMW Step-Wise Process. Additionally, CTUIR staff continued working on look forward projects with close coordination between BPA and BOR to develop core project complexes and initiate concept planning in conjunction with CTUIR-BPA Accord land acquisition strategies.

CTUIR staff also participated in a several educational and public outreach activities which included a poster presentation for tribal members for the Department of Natural Resources Open House and the Snake River Region Project and Data Sharing Symposium.

Planting and Maintenance of Vegetation

The CTUIR habitat program annually participates and/or assumes the lead role in re-vegetation activities on individual habitat restoration and enhancement projects. Planting and seeding methods are developed to address site specific conditions and vegetation objectives. Natural colonization and manual techniques are utilized.

Staff efforts associated with planting during the reporting period included installation of several thousand containerized trees (Black Cottonwood, Hawthorne, Ponderosa Pine, Douglas Fir, Elderberry, Salmonberry, and Red-Osier Dogwood) and live willow whips on disturbed banks of the CC44 Project (Phase II) and on disturbed areas adjacent to LWD structures on Rock Creek (Phase II). Planting this year totaled more than 10,000 containerized plants and 3,500 live whips. Disturbed areas were also seeded and mulched with a native grass seed mix consisting of Basin Wild Rye (33.06%), Rosanna Western Wheat Grass (19.07%), Snake River Wheat Grass (9.34%), Tufted Hairgrass (10.41%), Idaho Fescue (16.51%), Big Blue Grass (9.94%). Plants were installed using hand-held augers, a mini-excavator, and a compact tracked loader with an auger attachment.

Identify and Select Projects

Habitat protection, restoration and enhancement project opportunities were identified and developed during FY 2014. Activities included land and easement acquisition project identification and planning (Southern Cross Land Acquisition, Tsiatsos Ranch Conservation Easement, and Cunha Ranch Conservation Easement), coordination and planning with State, Federal, local partners, and private landowners, and participation on Grande Ronde Model Watershed (GRMW) Board and Technical Committee to evaluate projects for BPA funding through the Step-Wise Process.

Project staff initiated contact with landowners on 5 miles of Rock Creek (a contiguous section upstream of the current Rock Creek Project), and 1 mile of Dry Creek (a contiguous section upstream of the Willow Creek Oregon Ag Foundation Property) to discuss fish habitat restoration projects. Both contacts were interested in pursuing restoration projects.

Operate and Maintain Habitat & Structures

Project maintenance includes conducting custodial responsibilities on individual projects to ensure that developments remain in functioning repair and habitat recovery is progressing towards meeting projects goals and objectives. Activities included maintenance of plant enclosures and riparian fence along McCoy Meadows Project area, water gaps on Meadow Creek (Habberstad) and Catherine Creek (CC37), administration of a fence construction contract of approximately 3 miles of riparian fence on the Catherine Creek (CC44) Project, and repairs to fences along the Catherine Creek (CC37) Project.

Monitoring & Evaluation

Monitoring and evaluation (M&E) of individual projects is conducted either independently by the CTUIR or jointly with project partners depending on the project. Monitoring and evaluation efforts include annual photo-points, installation of water and air temperature probes, stream channel cross sections and longitudinal profiles, pebble counts, juvenile fish population and habitat surveys, stocking/census surveys on re-vegetation efforts, and groundwater monitoring. Public tours, workshops, and presentations of individual projects will continue to be conducted. These activities provide for the discussion of various approaches, restoration techniques, successes, failures, and ultimately adaptive management.

Project staff conducted presence/absence snorkel surveys on side channels as part of the pre-project data collection efforts for the Bird-Track Springs Project.

Following are descriptions of the various M&E components of the project followed by project specific monitoring results.

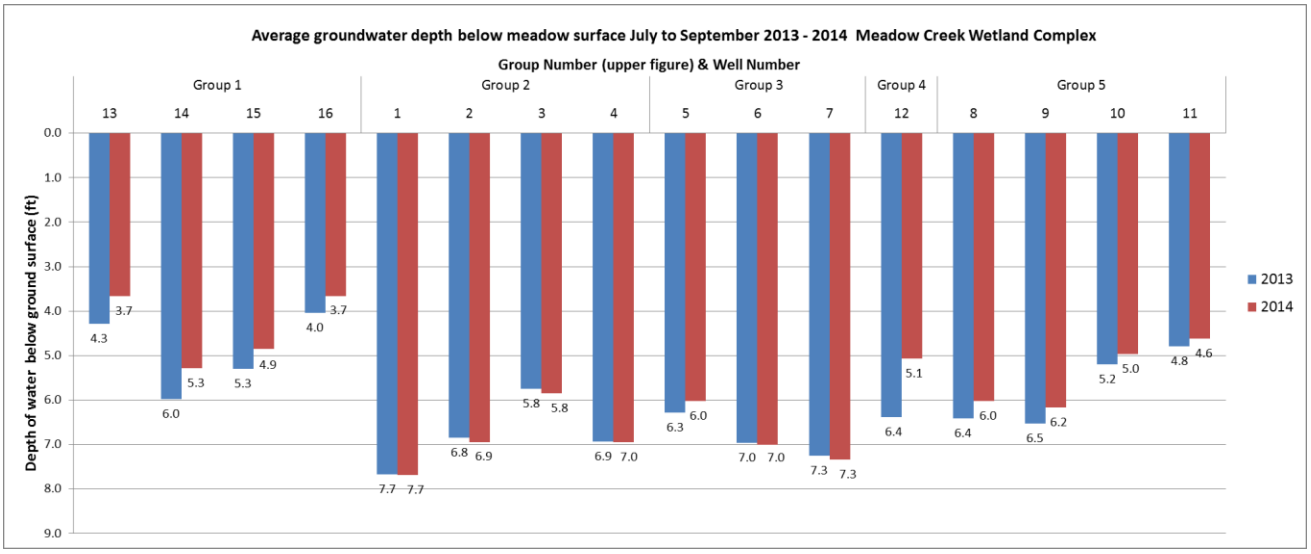
Groundwater Monitoring

Meadow Creek Groundwater

There were 16 shallow groundwater wells monitored in 2014 by CTUIR along the Meadow Creek Wetland complex on the McCoy Meadows Ranch. Data is plotted in relation to the meadow surface elevations at each monitoring well site in order to evaluate seasonal and annual changes in groundwater depths. Wells are grouped for these plots into 5 units that represent their position within the meadow system, with Group 1 located at the most upstream portion of the project (wells 13 to 16) and Group 5 being the most downstream group (wells 8 to 11).

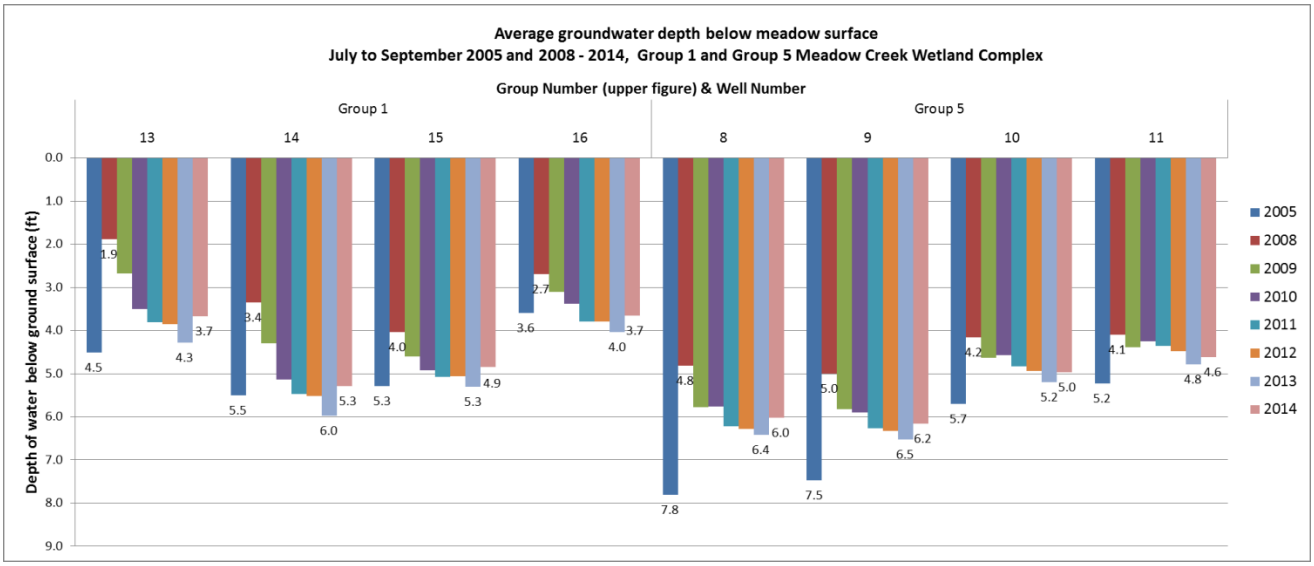
When comparing average groundwater elevations from depths measured in months July to September 2013 with records from July to September 2014 it appears that the shallow groundwater was closer to the meadow surface in 2014 for all wells except for those in Group 2 and wells 6 and 7 from Group 3 which didn't change (see Figure 30). The most significant change in average groundwater depth in 2014 compared to 2013 levels was seen in well 12 from Group 4 which increased 1.3 feet closer to the meadow surface.

FIGURE 29 AVERAGE GROUNDWATER ELEVATIONS ALONG MEADOW CREEK WITHIN THE MCCOY MEADOWS RANCH.



Average summer groundwater depths from months July to September 2008 to 2014 for the most upstream wells (Group 1) and most downstream wells (Group 5) were graphed (see Figure 25). In addition, pre-project measurements taken in 2005 during the same months are also shown for comparison. There is a six-year trend in decreasing groundwater elevation from 2008 to 2013. Groundwater records from 2013 are the furthest below meadow surface since 2005 pre-project levels. It is possible that sediment build up at the Meadow Wetland Intake prevented desired flows from main channel Meadow Creek to access the wetland channel and contributed to this drop in groundwater elevation. A possible down-cutting of Meadow Creek, and coinciding dropping of the water table, may also have been a factor in these groundwater differences. Groundwater depth measurements taken in 2014 indicate a consistent increase in groundwater elevation when comparing to summer seasonal average depths recorded from 2013 for Group 1 and Group 5 wells. The average increase in groundwater elevation in 2014 for these eight well sites was +0.4 feet. A possible explanation for the increase in groundwater elevation could be that mainstream Meadow Creek flows were allowed more access to floodplain and side channels, or that high flow diversion from the main channel persisted longer in these areas. All but one of the 8 wells (well #16) from Groups 1 and 5 retained water below pre-project levels. The average increase in groundwater elevation in 2014 compared to 2005 pre-project levels was +0.7 feet, which could be the result from seasonal high flows accessing the constructed Meadow Creek Wetland side channel.

FIGURE 30 2005 (PRE-PROJECT), 2008-2014 AVERAGE GROUNDWATER ELEVATIONS ALONG MEADOW CREEK WITHIN THE MCCOY MEADOWS RANCH.



McCoy Creek Groundwater

Groundwater well data was collected every two weeks beginning March 24, 2014 and ending November 6, 2014. A total of 16 surveys were conducted to measure the groundwater depth below meadow surface during these months. There were 34 groundwater wells monitored along the McCoy Creek restoration project in 2014. The percent of well measurements when wet versus when dry were recorded and plotted (see Figure 26) and shows a trend in increased groundwater within the project area from 2007 to 2011, a decrease from 2011 to 2012, and no significant change from 2012 through 2014. Of the 542 samples taken during 2014 65% occurred when wells contained water (wet).

Some survey records from 2010 to 2014 that were used to generate previous Wet versus Dry percentage plots were found to be slightly different than recorded field data. Conflicting records were corrected and an updated plot was generated (see figure 27)

Differences in data sets may have been the result from taking well-bottom elevation measurements when well contained a water column full of suspended sediment, opposed to when the well was dry and any suspended sediment allowed to settle, therefore resulting in a higher well-bottom elevation. Future surveys will incorporate these findings and will require a measurement be taken of each individual well-bottom elevation during every survey, in addition to groundwater depth measurements.

FIGURE 31 PLOT OF WET VERSUS DRY WELL MEASUREMENTS ALONG MCCOY CREEK 1997 TO 2014.

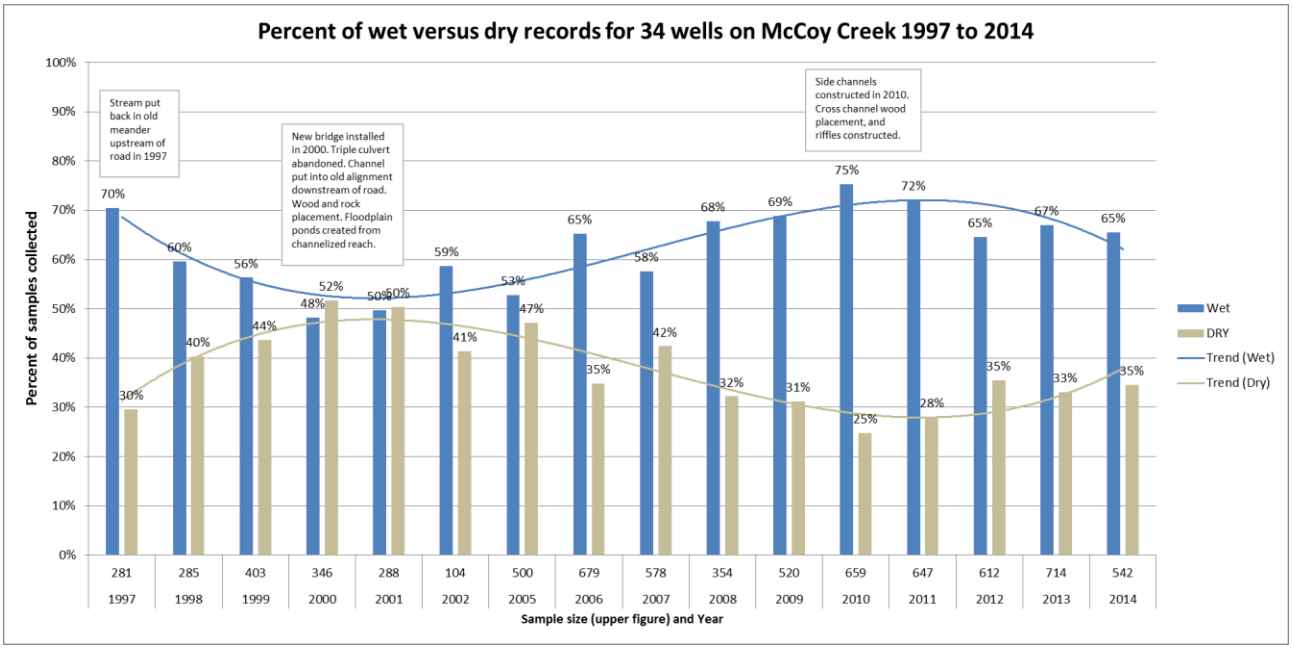
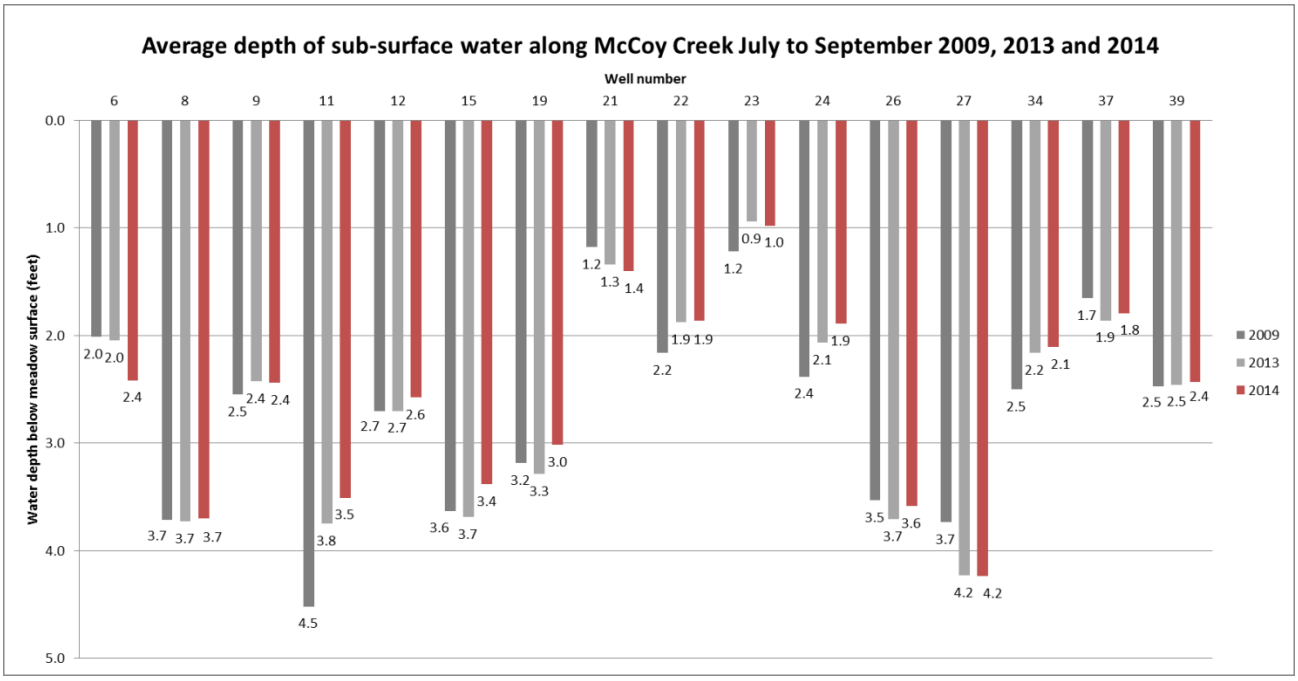


Figure 31 shows that sub-surface water is closer to the meadow surface post restoration effort in 8 of the 16 wells plotted from 2014 compared to measurements taken in 2013, and 10 wells held more water compared to 2009 groundwater conditions. 3 wells sampled in 2014 show an average decrease in groundwater compared to the year before, and 2 wells had groundwater levels identical to 2009 and 2013 measurements.

Figure 32 shows 16 wells that remained wet for at least 3 surveys during the months July to September in 2009, 2013, and 2014. Locations where water table levels dropped below the bottom of the well during July to September were not considered for annual comparison. 10 of the 16 wells sampled for these years contained average summer groundwater at a level that never dropped below 3 feet of the meadow surface, and 5 of these wells did not get below 2 feet of the meadow surface from July to September 2014. Only one well measured in 2014 recorded an average summer groundwater depth of below 4 feet from the meadow surface.

FIGURE 32 PLOT OF AVERAGE SUB-SURFACE WATER ELEVATIONS JULY TO SEPTEMBER FOR 2009, 2012, 2013, AND 2014 ALONG MCCOY CREEK



Catherine Creek (RM 43) Groundwater

12 groundwater wells were installed along Catherine Creek between at river mile 43 in January 2015 to monitor groundwater depths below ground surface. Groundwater depth measurements are surveyed every week to two weeks and recorded along with current Catherine Creek discharge at the time of each survey. Groundwater depths were plotted against Catherine Creek discharge measurements. There appears to be a correlation between groundwater elevation and current river stage, in that as cfs increases the groundwater elevations at most well sites also increases. This data will be used to predict groundwater depths using current river discharge readings when construction of the new channel begins.

Groundwater Summary

Groundwater Summary

Following the restoration efforts there appears to be some increase in the average sub-surface water elevation within the project area. Increased groundwater elevations are most evident near the upstream log structure (above the McIntyre road bridge), but is also evident within all the wells. There is a widespread increase in sub-surface water and the rising trend seen after 2000 is continuing. This trend of a sudden increase in sub-surface water followed by a gradual 'settling' has also been recorded along Meadow Creek. It is anticipated that with the activation of the McCoy Creek side channels, greater floodplain access at high flows, and the backing up of water within proximity to the log and riffle structures the sub-surface water within the well network will continue to be at a level greater than the lows of 2000 and 2001.

In contrast to McCoy Creek the sub-surface water within the Meadow Creek Wetland Complex has continued to decrease and is further down from the meadow surface in 2013 than any year since the activation of the wetland channel network. This reduction has reached the pre-project levels seen in 2005 at wells 4, 5, 14, 15 and 16 and is within 2 – 3 tenths of a foot of those levels for 3 other wells when comparing summer groundwater depths July – September.

Dark Canyon Creek - Summary of CTUIR stream monitoring within the lower 2 miles of 2009 to 2014

In late July 2010, fish habitat enhancements were implemented by CTUIR along 1.9 miles of Dark Canyon Creek and 1 mile of Meadow Creek within the boundaries of the Cunha Ranch. The project area is located near Starkey, Oregon in the Upper Grande Ronde Subbasin. The project legal description is Township 3 South, Range 35 East, portions of Sections 24, 25, and 36, Willamette Meridian, Union County Tax Lot 500. Approximately 150 pieces of large wood was added to Dark Canyon Creek and Meadow Creek in existing pools, or placed in a manner to create pool habitat and provide in-stream habitat complexity. The objective of the large wood additions was to contribute to floodplain formation and stability by increasing roughness, slowing water velocities, and trapping sediment. Furthermore, large wood was used in order to increase pool habitat quality and quantity and to provide thermal and predatory refuge for aquatic species including the aforementioned ESA listed fish species.

In 2012 CTUIR, in cooperation with the landowner and NRCS, developed four off-channel springs for livestock watering, and constructed 3.6 miles of pasture fence. At the time of writing (April 2015) there has been no construction of riparian fences or planting of the riparian corridor. The landowner, The Blue Mountain Land Trust and CTUIR/BPA are in the process of developing a permanent conservation easement that covers the entire 3,000-acre ranch.

Since August 2009, the CTUIR Grande Ronde Fish Habitat program has monitored water temperature at two locations within Dark Canyon Creek – an upper probe site (DC2) at river mile 1.9 and a lower probe site (DC1) at river mile 0.06. Temperatures at these two sites are, with the exception of 2009, monitored from April to October each year.

Temperature probes deployed are Onset HOBO© Pendant 64k loggers set to record at 1-hour intervals. Probes are housed in a metal tube that is anchored to the streambed and cabled to a post or tree on the bank. The same location for each probe has been used from 2009 to 2014 and the same probes deployed to each site during this period. Each year prior to deployment probes are calibrated using a NIST certified thermometer.

Diurnal fluctuations in water temperature are less in 2014 than those recorded in 2009 (pre-project) at the lower probe site (river mile 0.06), but are similar at the upper probe site (river mile 1.9). This may indicate a possible cooling effect through the project area seen in 2014 that is not present in 2009 (see Figure 1 & 2).

A possible cooling trend is also evident when exploring summary values for stream temperatures in Table 1. Where in 2010 the 308 records of temperatures >=20°C were recorded with similar distribution of values at both upper and lower sites with 52.6% of those records recorded at the upper site compared to 47.4% at the lower. This similarity is not present by 2014 where the upper site records 96.5% of the 318 >=20°C records.

From the temperature data collected since 2009, it is evident that water entering the project area has been increasing in the number of >=20°C records (see Figure 3). However, it is beyond the scope of this monitoring effort and these data to explain why this is occurring. The scope of inference for these data is restricted to the project area (the lower 1.9 miles of Dark Canyon Creek), but within that scope it can be demonstrated that following fish habitat restoration actions there is a cooling trend through the project area.

FIGURE 33 PLOT OF DIURNAL FLUCTUATIONS IN WATER TEMPERATURE AT THE UPPER PROBE SITE (RIVER MILE 1.9) FOR 2009 AND 2014. ALTHOUGH THERE IS A SLIGHT SKEW IN TIMING OF PEAK TEMPERATURES THE DIURNAL FLUCTUATION ARE VERY SIMILAR FOR THESE TWO YEARS.

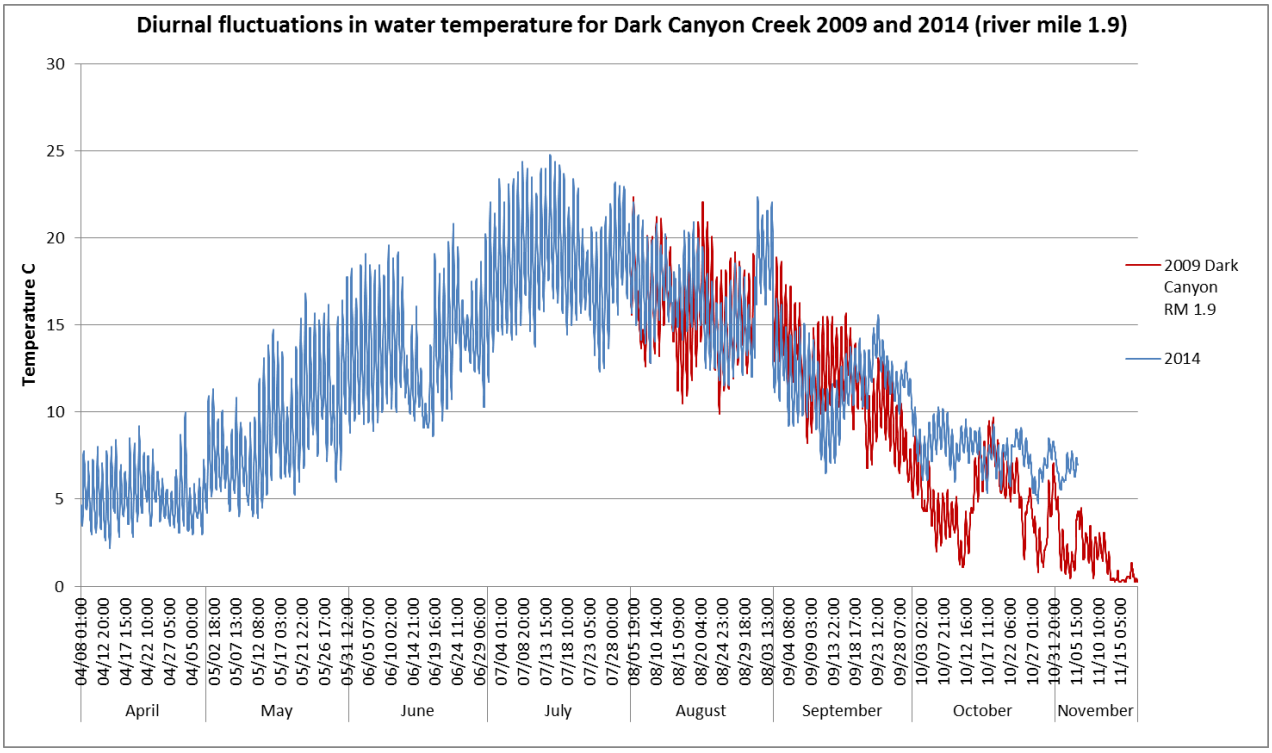


FIGURE 34 **PLOT OF THE DIURNAL FLUCTUATION IN WATER TEMPERATURE AT THE LOWER PROJECT SITE (RIVER MILE 0.06) FOR 2009 AND 2014. PLOT SHOWS THE REDUCTION IN DIURNAL FLUCTUATIONS OF WATER TEMPERATURE RECORDED AT THIS SITE IN 2014 COMPARED TO THE PRE-PROJECT DATA OF 2009.**

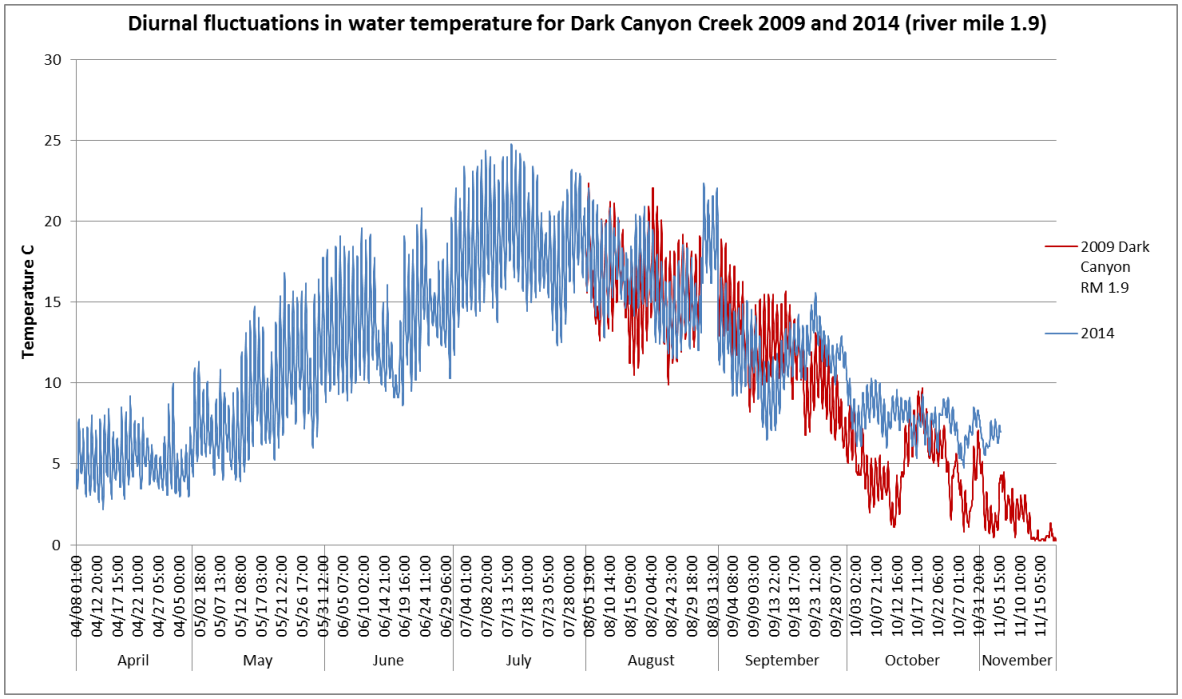
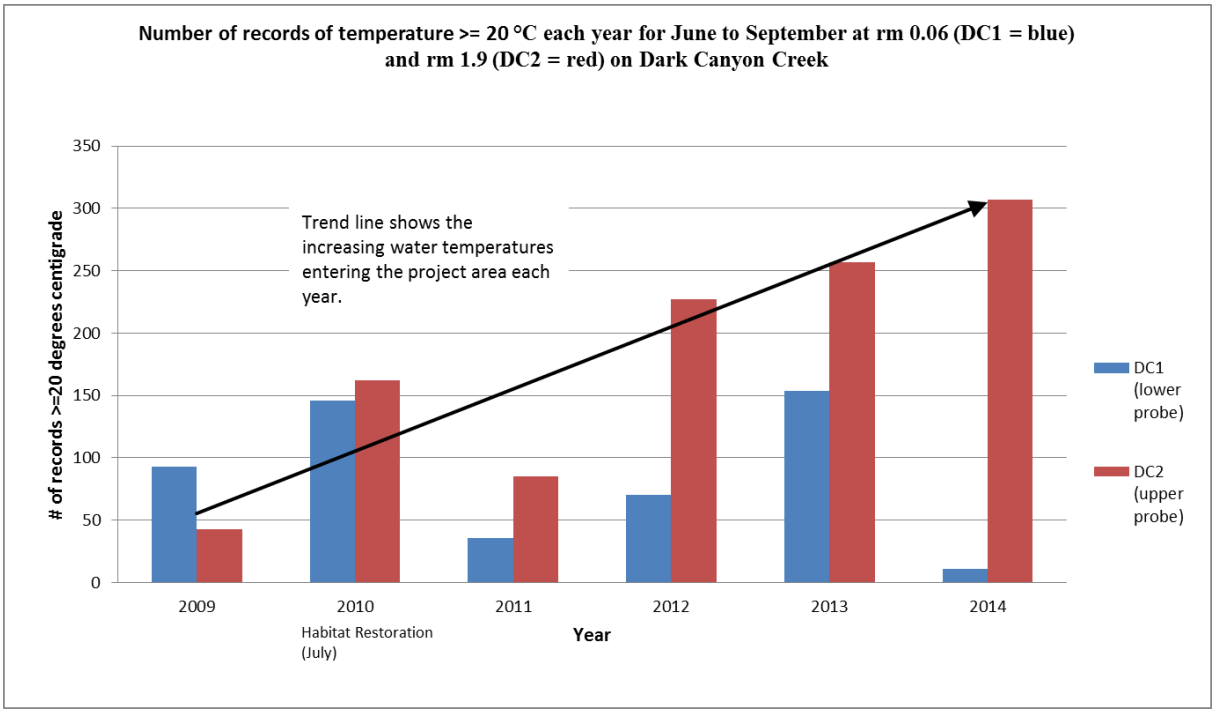


TABLE 13 **SUMMARY METRIC FOR WATER TEMPERATURE PROBES AT TWO SITES ALONG DARK CANYON CREEK FROM 2010 TO 2014. SHADED AREA IS THE LOWER PROJECT SITE.**

Stream	Location Name	River mile	Year	# of Days Deployed	# of Hours for Analysis	Max Temperature (° C)	Hours >=25 ° C	Hours >=20 ° C	Hrs. at 10 - 15.6 ° C	% at 10 - 15.6 ° C	Mean daily >=17.8 ° C (# days)	% of deployment when Mean daily >=17.8 ° C
Dark Canyon Creek	DC1	0.06	2009	106	2544	23.1	0	93	874	34.4	1	0.94
Dark Canyon Creek	DC1	0.06	2010	226	5398	22	0	146	2156	39.9	0	0.0
Dark Canyon Creek	DC1	0.06	2011	145	3480	20.901	0	36	2120	60.9	0	0.0
Dark Canyon Creek	DC1	0.06	2012	191	4536	24.2	0	75	2204	48.6	2	1.0
Dark Canyon Creek	DC1	0.06	2013	215	5161	24.35	0	154	1988	38.5	5	2.3
Dark Canyon Creek	DC1	0.06	2014	217	5184	20.3	0	11	2345	45.2	3	1.4
Dark Canyon Creek	DC2	1.9	2009	106	2544	22.3	0	43	789	31.0	2	1.89
Dark Canyon Creek	DC2	1.9	2010	226	5399	22.7	0	162	1761	32.6	6	2.7
Dark Canyon Creek	DC2	1.9	2011	145	3480	21.951	0	85	1618	46.5	4	2.8
Dark Canyon Creek	DC2	1.9	2012	191	4535	23.8	0	227	1702	37.5	20	10.5
Dark Canyon Creek	DC2	1.9	2013	215	5161	24.93	0	257	1632	31.6	17	7.9
Dark Canyon Creek	DC2	1.9	2014	217	5184	24.7	0	307	1704	32.9	29	13.4

FIGURE 35 PLOT OF THE NUMBER OF WATER TEMPERATURES >=20°C ON DARK CANYON CREEK. PLOTTED TREND LINE DEMONSTRATES THAT WARMER WATERS ARE ENTERING THE PROJECT AREA EACH YEAR (RED BARS), BUT THIS WATER IS COOLING AS IT MOVES THROUGH THE PROJECT AREA TO THE LOWER PROBE SITE (BLUE BARS).



Fish Use within the Dark Canyon Creek Project Area

Steelhead Spawning

Steelhead spawning surveys were first carried out by the CTUIR Fish Habitat Program on the Dark Canyon project in April – June 2010 to provide a baseline of current fish use and to map the distribution of redds for project planning purposes. Surveys were for 1.9 miles of stream within the Cunha Ranch property boundary. At that time 5 redds were observed in six surveys and these were clustered at the upstream section of the property (see map below for distribution), this gave an average of 2.6 redds per mile of surveyed stream. It was noted in pre-project habitat surveys that most of the natural accumulation of woody debris was in the upper most ½ mile of the property. The following April (2011) was the first spawning season post habitat enhancement work and surveys mapped four redds in six surveys giving an estimated density of 2.1 redds per mile of surveyed stream. The distribution of these redds was greater than that seen pre-habitat work and covered more than half the project stream length. Surveys in 2012 recorded 19 redds (10 redds per mile) with a distribution further downstream than those recorded in 2011. By 2013 redd distribution was throughout all of Dark Canyon within the ranch boundary and was at a density of 8.4 redds per mile (16 redds total). The same number of redds, density and distribution throughout the 1.9 miles of stream was also recorded for surveys in 2014.

Juvenile Rearing

Snorkel surveys were conducted each July from 2010 (pre-project baseline data) through 2014. There were no juvenile Chinook observed in 2010. However, they have been recorded since then, with a maximum of 202 observed in 2011 to a low of seven in 2014. Densities of juvenile Chinook have ranged from a 29.8 fish/100m^2 of pool habitat to a low of 1.1 fish/100m^2 with the average over the post restoration period being 14.9 fish/100m^2 of pool habitat.

Juvenile *O.mykiss* have been observed each year surveyed at densities of 46.5 fish/100m^2 of pool habitat to 20.3 fish/100m^2 . The dominant age class of *O.mykiss* has been young of the year for each survey with this age class making up an average of 80% of the fish observed. The highest ratio of young-of-the-year compared to other age classes was observed in 2010 (91% of all fish observed that year), with 2014 being the next highest at 84.5 % of all fish observed.

FIGURE 36 DISTRIBUTION OF STEELHEAD REDDS ON THE LOWER 1.9 MILES OF DARK CANYON CREEK 2010 TO 2013. DISTRIBUTION OF REDDS IN 2014 AND 2015 ARE SIMILAR TO THOSE OF 2013.

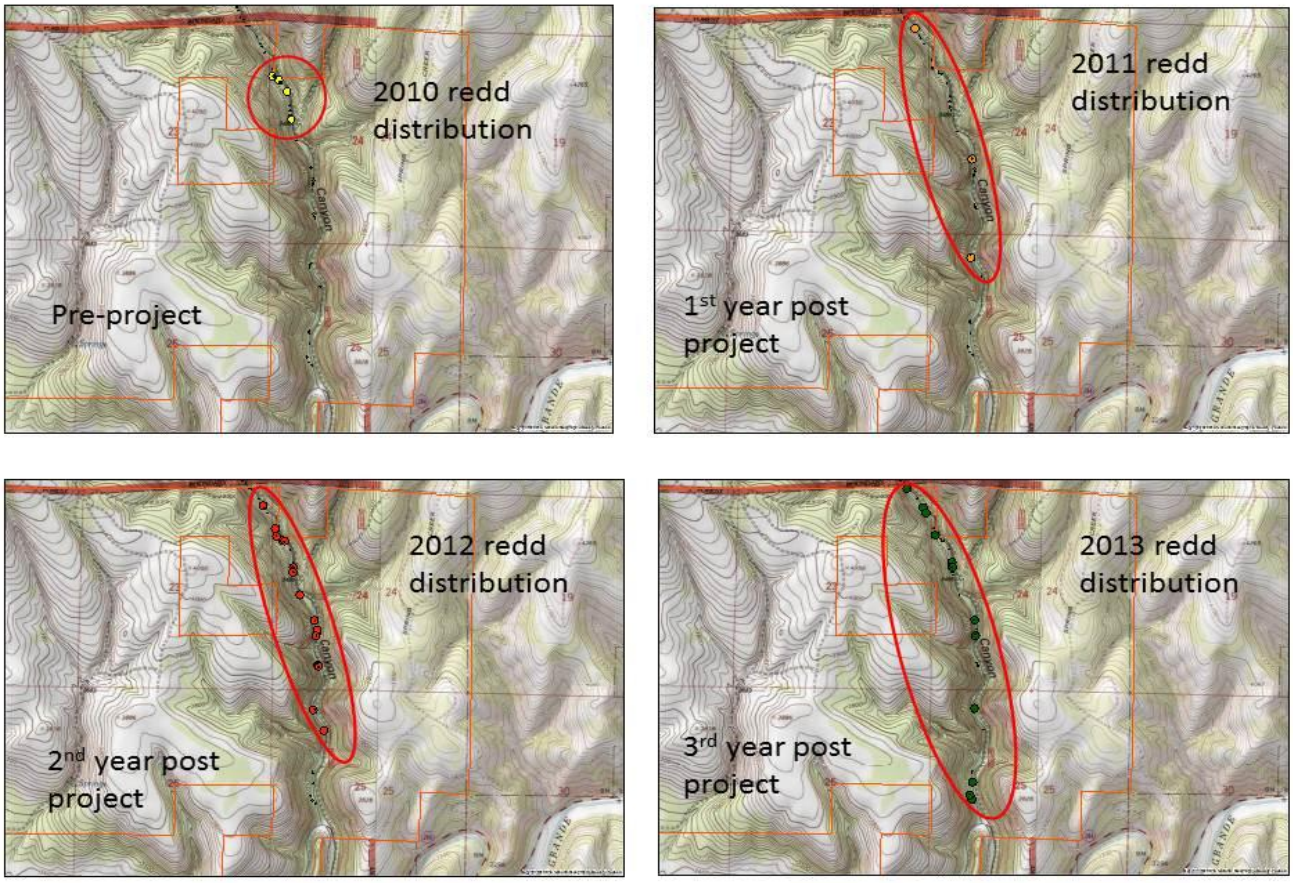


FIGURE 37 DISTRIBUTION OF AGE CLASS OF *O.MYKISS* DERIVED FROM SNORKEL SURVEYS ON DARK CANYON CREEK FROM 2010 TO 2014.

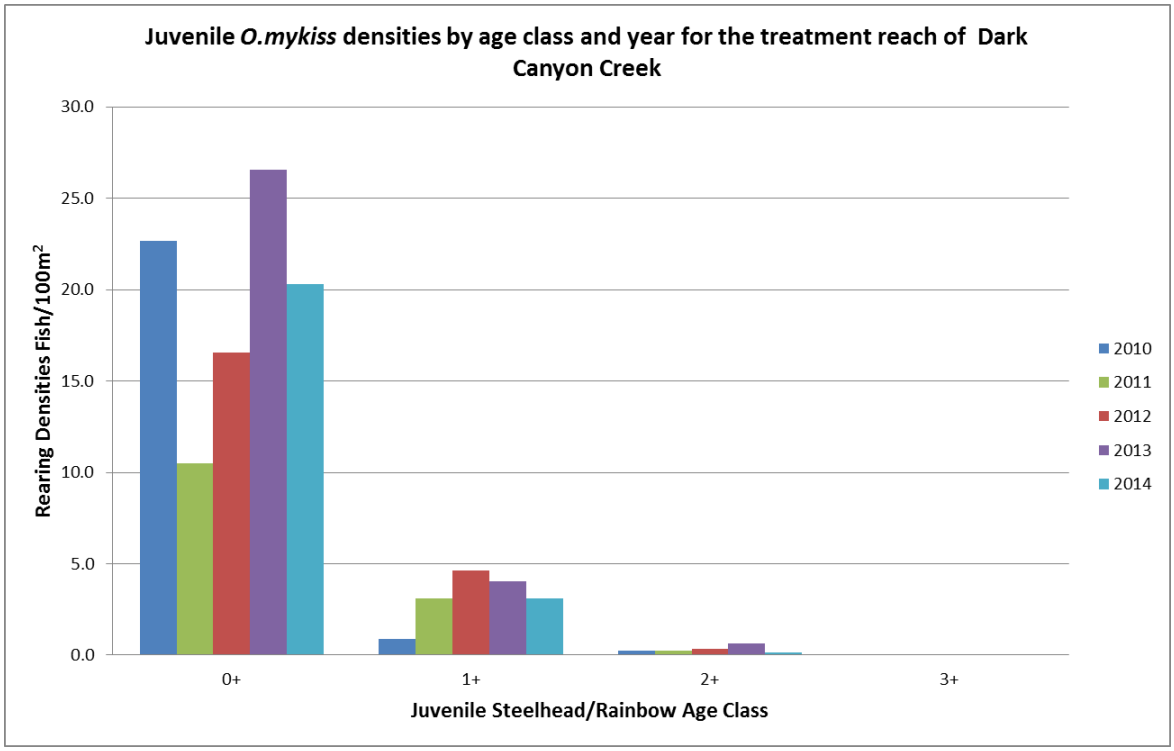


Photo Point Monitoring

Photo points are an effective monitoring method used to document morphological changes on restoration projects. Representative photos are taken at intervals throughout each project, the number being determined by the project size and complexity. A master photo point notebook is used to align each subsequent year's photo with the image taken the previous year. Ideally, images are captured in the exact location as the earlier image, with landmarks (trees, hillsides, etc.) used to align the photo. Images are taken during midday for optimal lighting conditions with a Nikon D3100 camera and jpeg images are saved into a master photo point file. Aerial photos are also taken at varying intervals along several project locations.

During 2014 photo points were taken at 7 separate projects. A total of 60 photos were taken, and GPS coordinates were recorded at each photo point site. Each photo point site is marked with a green T-133 post or a 1 foot rebar stake. Photo points are located at sites along project reaches with good visibility of stream-bank vegetation areas where morphological changes are likely to occur. Photo points are typically taken other year; however, some project photo points are taken every other year.

FIGURE 38 PRE AND POST PROJECT PHOTO POINTS.

Rock Creek Pre Project

Rock Creek Post Project

Catherine Creek (CC44) Pre Project

Catherine Creek (CC44) Post Project

Catherine Creek (CC37) Pre Project

Catherine Creek (CC37) Post Project

2014 Water Temperature Monitoring

Water Temperature 2014 Summary

During 2014, forty five (45) temperature probes were deployed within the Grande Ronde Basin, all recording at 1-hour intervals. Four additional probes were deployed in 2013, one on the upper reach of Rock Creek as part of the Rock Creek Fish Habitat Enhancement Project monitoring and three on the Grande Ronde River - at Hilgard State Park, below the mouth of Jordan Creek, and at Bird Track Springs campground, to monitor pre-project temperatures for the upcoming Hilgard and Bird Track projects.

Summary statistics were calculated for each probe that included the number of records when temperatures were at or exceeded the DEQ lethal limit of 25ºC, the number of records when temperatures were at or exceeded 20ºC, and when temperatures were within a range of 10ºC to 15.6ºC (the preferred temperature range of juvenile Chinook salmon – as cited by Yanke et. al. 2003). The number of days when the mean temperature was at or exceeded the DEQ standard of 17.8ºC was also calculated. Diurnal fluctuations in water temperature were also plotted.

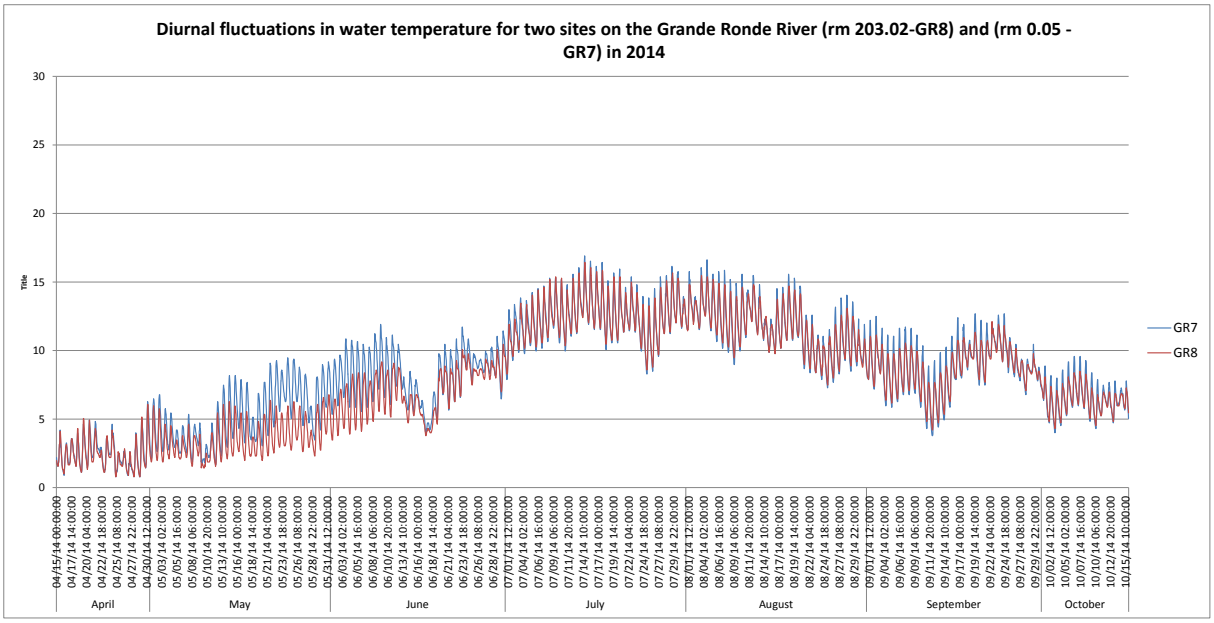
The following summary of water temperature data will be broken down into an overview of each sub-watershed area which includes: the Upper Grande Ronde, the Mainstem Grande Ronde, Meadow Creek, McCoy Creek, Dark Canyon Creek, Rock Creek, and Lower Grande Ronde sub-basin (Willow Creek, South Fork of Willow Creek and End Creek). A summary of temperature metrics for the Upper Grande Ronde and sub-watersheds can be seen in Table 14.

Meadow Creek Watershed

Six probes were deployed along the Upper Grande Ronde River (including the East Fork and Clear Creek) to encompass the Mine Tailings Removal Project and downstream of Vey Meadows Ranch. During 2014 these probes recorded data for 184 days (between 4/14/2014 and 10/16/2014). There were 963 records removed from the dataset due to either a probe being out of the water or similar reported problems, leaving 25,533 hours logged for analysis. During 2014 there were 37 records at the lower site below Vey Meadows (GR4) for temperatures >= 25°C. There were 523 records of temperatures >= 20°C.

- The upper probe on the Grande Ronde River (GR8), at river mile 203, logged 4,415 hours of data, the East Fork Grande Ronde River (GR7) logged 4,416 hours of data. There were 0 records of lethal limits or temperature >= 20 °C at both sites. These sites had zero hours >= 25°C or >= 20°C, a maximum temperature of 16.9°C, 1546 records when temperatures ranged between 10° - 15.6°C (35.0% of the data), and zero records of mean daily temperatures exceeded 17.8°C.
- The probe below the Vey Ranch (GR4) had 37 hours of lethal limits recorded compared

FIGURE 39 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE AT TWO LOCATIONS WITHIN THE UPPER GRANDE RONDE RIVER.

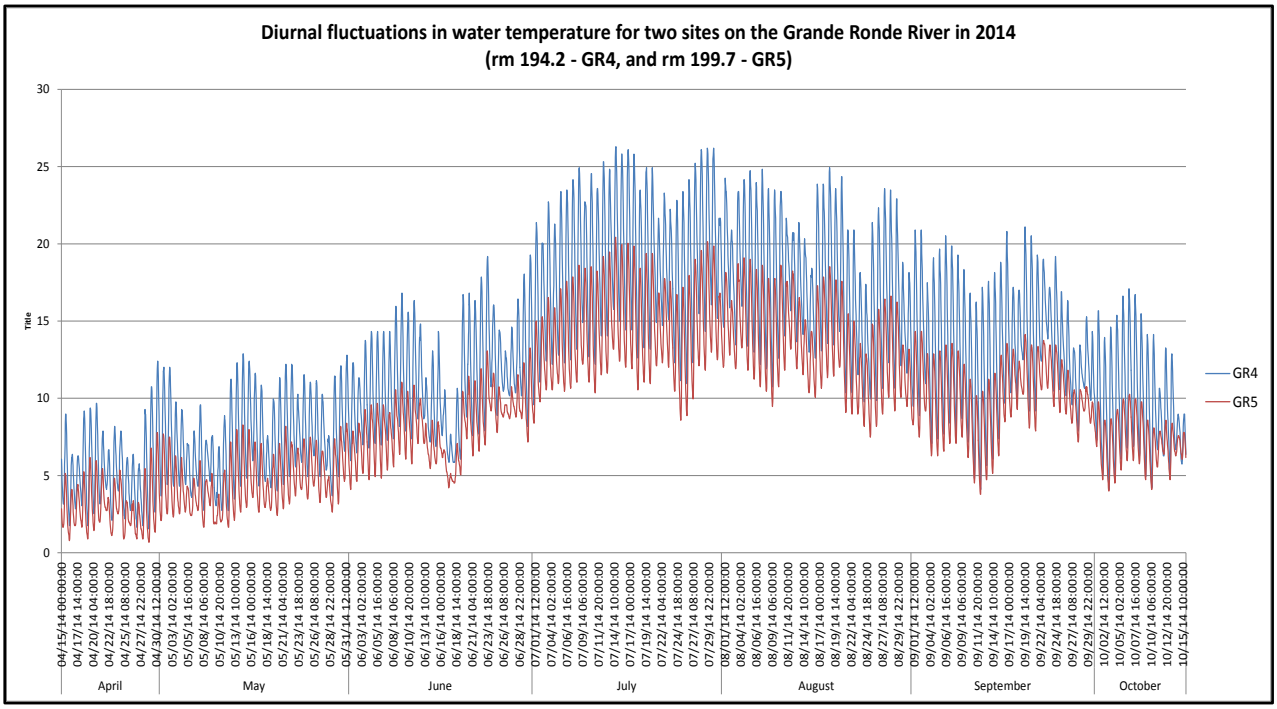


Temperatures were below 17.8°C for the recording period of 4/15/2014 to 10/16/2014 at the upper probe site and from 4/14/13 to 10/15/2014 on the East Fork of the Grande Ronde River. The plot shows similarity in water temperatures at the two sites. Diurnal fluctuations were typically within 4 degrees centigrade.

to 0 at the probe above the acclimation facility (GR5). There were 523 records of temperatures >=20°C at GR4 and 6 records at GR5. Approximately 33.1% of the deployment period at GR4 site was in 10-15.6 °C range compared to 32.9% at GR5, and GR4 had 38 days recorded with a mean >= 17.8 °C compared to 0 at GR5.

- The middle Grande Ronde River probe (GR6) and the Clear Creek probe (CLC1) had 0 records of temperature >= 25°C or >=20°C. Approximately 21.3% of data at CLC1 was in 10-15.6°C range compared to 32.8% at GR6. No records of mean daily >=17.8 °C were recorded at either site.
- Comparisons with other years show:
  1. GR4 had the second highest number of lethal limit and temperature >=20ºC since 2010 (highest was in 2013). GR4 had the second lowest percent of time in the 10-15.6ºC range (lowest was in 2013), and the second highest number of days with a mean daily temperature >=17.8ºC since 2010 (highest was in 2013).
  2. GR5 had 6 hours with temperatures >=20ºC in 2014 compared to 9 hours in 2013 and 0 in other years, the percentage of time in the 10-15.6ºC range was lower in 2014 than all other years since records began in 2010.
  3. GR6 had a maximum temperature (18.0ºC) recorded in 2014 that was higher than 2010 and 2011, but lower than 2012 and 2013.
  4. GR7 had the second highest maximum temperature since 2010 (16.9ºC) and the percentage of the deployment period in the 10-15.6ºC range (35.0%) was higher than 2010 and 2011, but lower than 2012 and 2013.
  5. GR8 had the second highest maximum temperature since 2010 (17ºC) and the percentage of the deployment period in the 10-15.6ºC range (32.8%) was higher than 2011 and 2012, but lower than 2010 and 2013.

FIGURE 40 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE ALONG THE GRANDE RONDE RIVER DURING 2014.



Meadow Creek Watershed

The CTUIR Fish Habitat Project had 12 probes deployed in 2014 within the Meadow Creek Watershed covering 4 streams – Battle Creek, Meadow Creek, McCoy Creek, and Dark Canyon Creek. The probe data was then grouped by project for this report. The projects were:

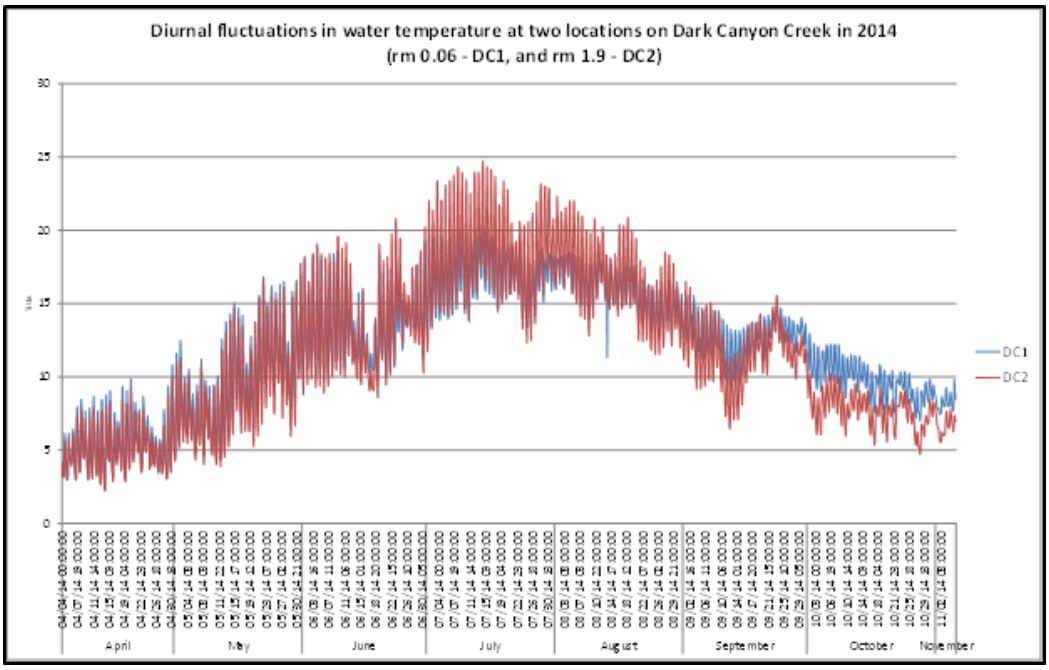
- Dark Canyon (landowner Joe Cunha), with 2 probes – DC1 and 2 at river miles 0.06 and 1.9 respectively.
- McCoy Meadows Ranch (landowner Mark and Lorna Tipperman) McCoy Creek, with 3 probes – MCCOY1, 6, 7 at river miles 2.7, 1.5, and 0.1 respectively.
- McCoy Meadows Ranch (landowner Mark and Lorna Tipperman) Meadow Creek and the Wetland Complex, with 4 probes – MEADOW1 and 2 on mainstem Meadow Cr at river mile 2.9 and 1.5 respectively, and MEADOW3 and 4 on the wetland channel at river mile 1.06 and 0.17 respectively.
- Meadow Creek Habberstad (landowner John Habberstad), with 3 probes – MEADOW5 and 6 at river mile 7.53 and 6.77 respectively and BATTLE1 on Battle Creek at river mile 0.04.

Dark Canyon Creek

The two probes along Dark Canyon Creek were deployed from 4/3/2014 to 11/6/2014 and logged a combined total of 10,368 hours of water temperature. There was a combined total of 4,049 records where water temperature was between 10ºC and 15.6ºC (an average of 39.1% of all logged temperatures for these two sites).

- No records of lethal limits (>= 25ºC). There were 318 records of temperatures >= 20°C.
- The upper site had 29 days and the lower site had 3 days where the mean daily was >=17.8ºC.
- The upper site had 32.9% of its logged temperatures between 10ºC and 15.6ºC (1,704 hours) compared to 45.2% for the lower site (2,345 hours).
- The upper site had more hours >=20 °C in 2014 compared to previous 3 years (307 hrs).
- The lower site had the fewest hours >=20 °C in 2014 compared to previous 3 years (11 hrs).
- The upper site had a maximum temperature of 24.7ºC compared to 20.3ºC at the lower site, recorded 7/14/2014.

FIGURE 41 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE ALONG DARK CANYON CREEK DURING 2014.

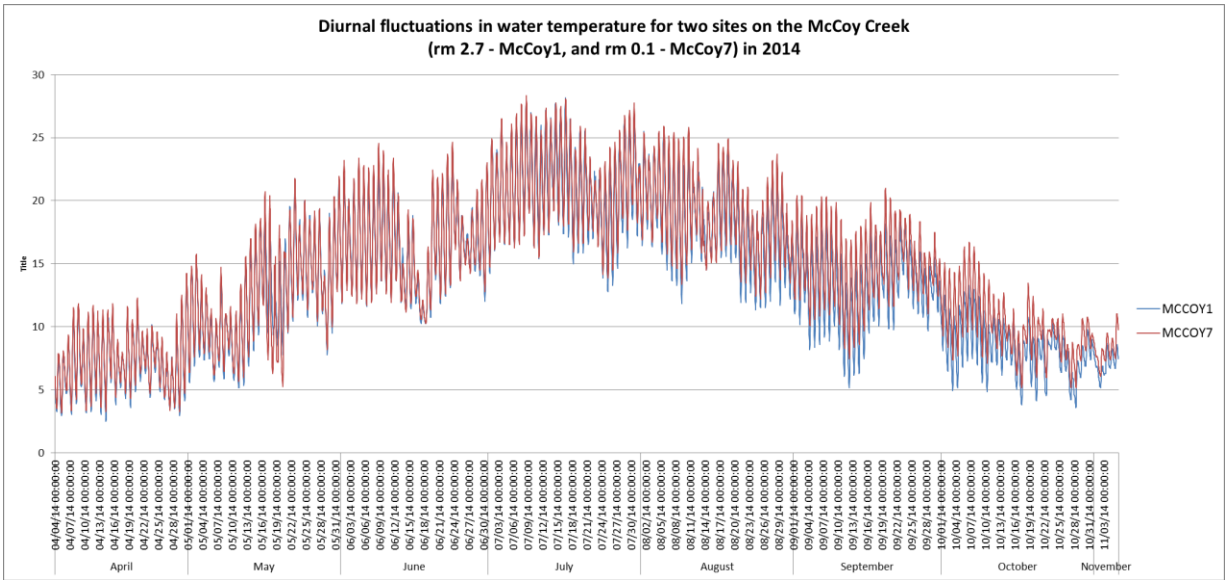


McCoy Creek

There were a total of 14,195 hours of data from 3 probes for the analysis collected between 4/4/2014 and 11/6/2014. Combining the data for the probes gave a total of 4,299 hours when water temperature was between 10ºC and 15.6ºC (an average of 30.1% of the data).

- A total of 353 hours logged when temperatures reached 25ºC or higher.
  - The lowest site on McCoy Creek in 2014 had the highest maximum temperature (28.3 ºC), greatest number of records at lethal limits (136 hrs), greatest number of records where temperatures were >=20 °C (904 hrs) but had the greatest percent time in 10-15.6 °C range compared to the other 2 sites (31.4%).
  - All 3 sites had the second highest maximum temperature since 2010 (2013 being the one year that was warmer).
  - The most downstream site had the second highest number of temperature records >=20ºC and >=25ºC since 2010 (2013 being the one year that same site had a higher number of records).
  - The mid property site had the lowest percent time in 10-15.6ºC range compared to records from that site since 2010.
  - All 3 sites had the highest number of days with a daily mean >=17.8ºCsince 2010.
- There were a total of 2,794 records of temperatures >= 20°C,
  - MCCOY1 recording 809 hours,
  - MCCOY6 recording 902 hours,
  - MCCOY7 recording 1083 hours.
- Mean daily temperatures were >=17.8ºC on a maximum of 82 days at river mile 0.1 (see Table 14).

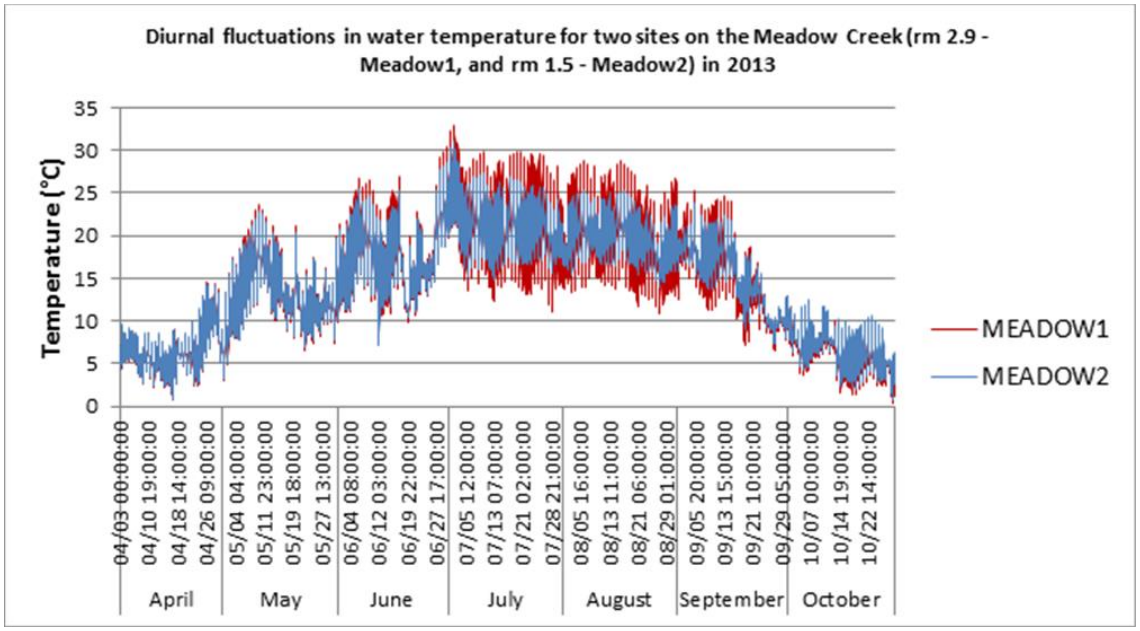
FIGURE 42 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE ALONG MCCOY CREEK DURING 2014.



Meadow Creek

The probe at river mile 2.9 (MEADOW1) was deployed for 202 days between 4/16/2014 and 11/4/2014 and the probe at river mile 1.5 (MEADOW2) was deployed for 120 days between 7/7/2014 and 11/4/2014. They recorded a total 7,728 hours of data for the analysis.

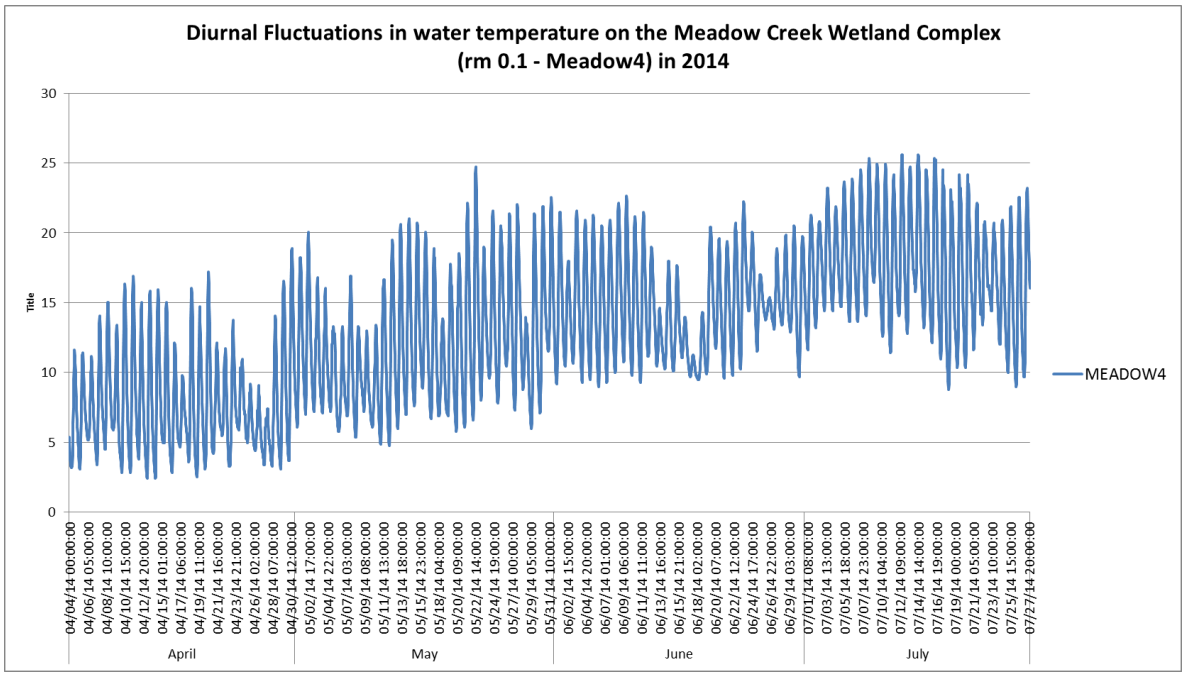
FIGURE 43 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE ALONG MEADOW CREEK DURING 2014.



Meadow Creek Wetland Complex

Two probes were placed within the constructed channel (the 'C' channel) at river miles 1.06 and 0.17, with the deployment dates for the upper probe (MEADOW3) deployed from 4/3/2014 to 6/17/2014 and the lower probe (MEADOW4) deployed from 4/3/2014 to 7/28/2014.

FIGURE 44 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE ALONG THE MEADOW CREEK WETLAND COMPLEX DURING 2014.

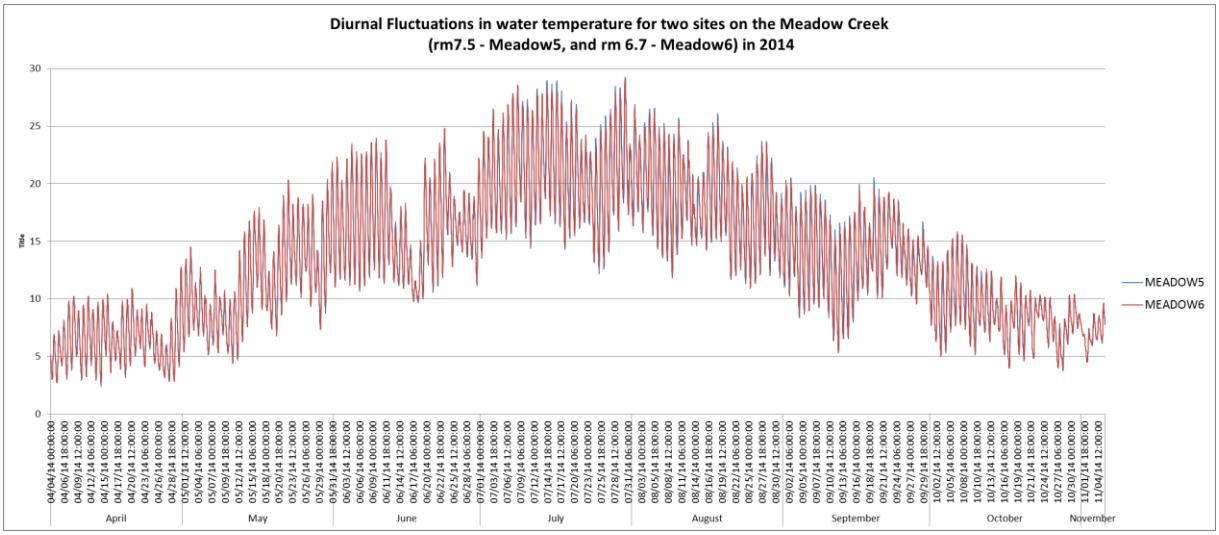


Meadow Creek Habberstad Property

Meadow Creek - Habberstad

Two probes were deployed on Meadow Creek within the Habberstad restoration project. These probes were at river mile 7.53 (MEADOW5), and 6.77 (MEADOW6) and were deployed for 217 days from 4/3/2014 to 11/6/2014 for a total of 5184 hours for analysis.

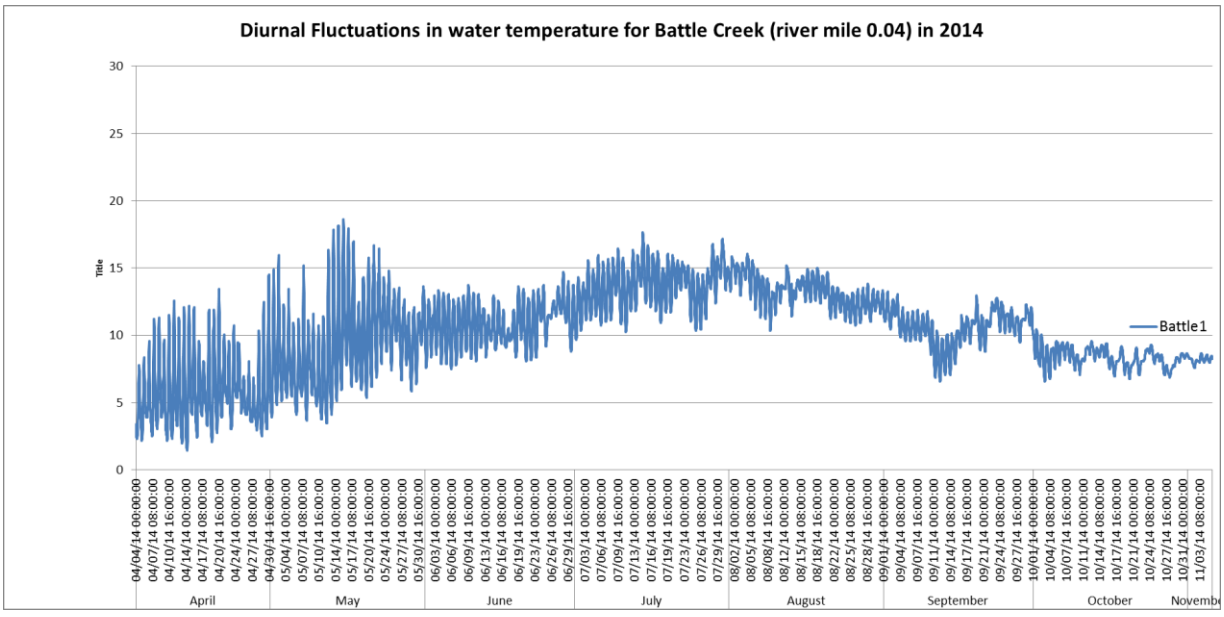
FIGURE 45 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE AT TWO LOCATIONS ON MEADOW CREEK DURING 2011 WITHIN THE HABBERSTAD PROJECT AREA.



Battle Creek - Habberstad

There was one probe deployed on Battle Creek during 2013 at river mile 0.04 between 4/2/2014 and 11/6/2014 for a total of 5184 hours for analysis.

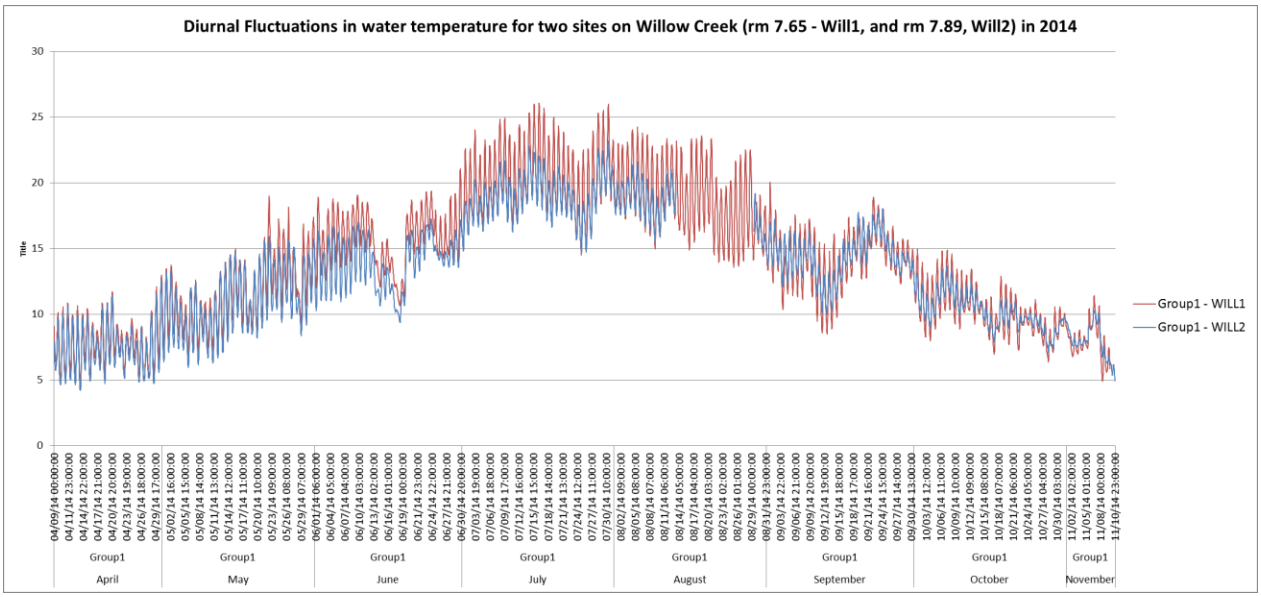
FIGURE 46 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE ON BATTLE CREEK DURING 2014 WITHIN THE HABBERSTAD PROJECT AREA.



Willow Creek and Tributaries on McKenzie Trust and Stephen Craig Propertes

Seven probes were deployed within the boundaries of the McKenzie Trust property in order to monitor the Willow Creek Fish Habitat Enhancement Project on the Mackenzie Trust/Stephen Craig properties. Five probes were installed on mainstem Willow Creek (WILL1 – WILL5) and the remaining 2 on Dry Creek and Fir Creek. Data was recorded for 216 days between 4/9/2014 and 11/12/2014. There was a total of 33,459 hours logged for analysis, wherein 1 probe (WILL1) reached the DEQ salmonid lethal temperature limit of 25°C for 28 hours. Diurnal fluctuations in water temperatures were plotted and a sample of these data is displayed below in Figures xx

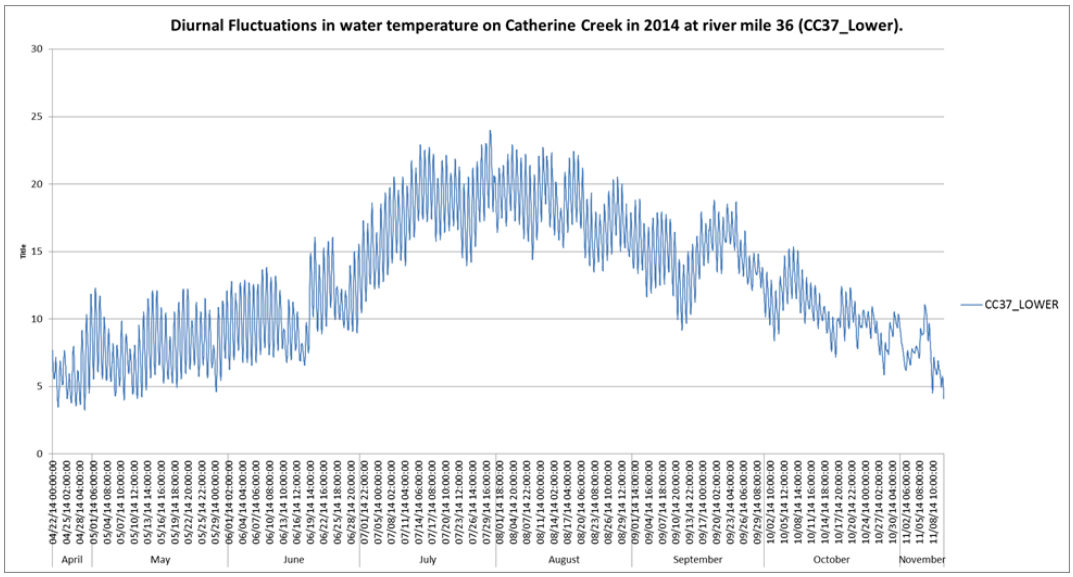
FIGURE 47 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE ON WILLOW CREEK DURING 2014.



Catherine Creek 37

Two probes were deployed within the boundaries of the Yeargain property in order to monitor the CC37 Fish Habitat Enhancement Project, constructed July-August, 2012. The upper probe at river mile 24 had less hours for analysis (4848 hours) compared to the lower probe at river mile 37 (4872 hours). Both probes had 0 records of lethal limits.

FIGURE 48 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE ON CATHERINE CREEK (CC37) DURING 2014.



Catherine Creek 44

To monitor water quality (temperature) within the Catherine Creek River Mile 44 (CC44) Project area CTUIR deployed 3 Hobo Pendant temperature probes within the boundaries of several property owners. All 3 probes deployed from 4/15/14 to 11/10/14 for a total of 209 days with a total of 14976 hours recorded for analysis. All probes had 0 records of lethal limits.

FIGURE 49 DIURNAL FLUCTUATIONS IN WATER TEMPERATURE ON CATHERINE CREEK (CC44) DURING 2014.

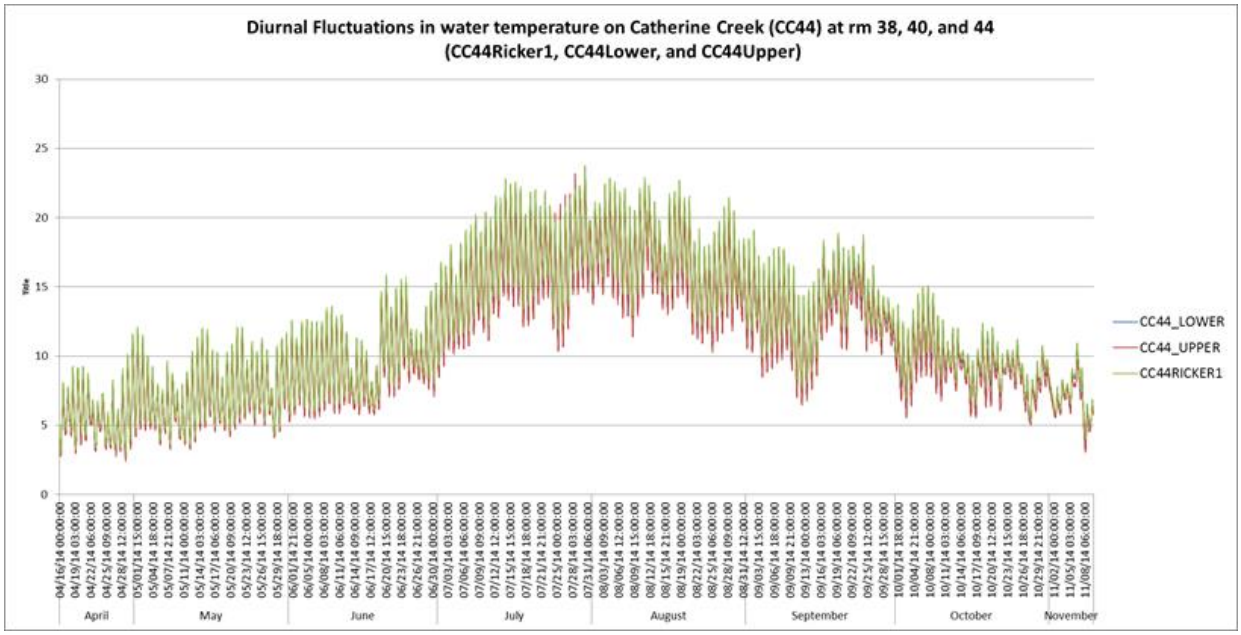


TABLE 14 **WATER TEMPERATURE PROBE METRICS FOR 32 SITES IN THE UPPER GRANDE RONDE, MAINSTEM GRANDE RONDE, ROCK CREEK, MEADOW CREEK, DARK CANYON CREEK, MCCOY CREEK, AND CATHERINE CREEK SUB-WATERSHEDS DURING 2014.**

Stream	Location Name	River mile	Date Start	Date End	# of Days Deployed	# of Hours in Deployment Period	# of Hours For Analysis	Max Temperature (°C)	Hours >=25 ºC	Hours >=20 °C	Hours at 10-15.6 °C	% at 10-15.6 °C	Daily temp >= 17.8 (# days)
Battle Creek	BATTLE1	0.04	4/4/2014	11/5/2014	216	5184	5184	18.62	0	0	2712	52.3	0
Clear Creek	CLC1	0.06	4/15/2014	10/15/2014	144	3454	3454	18.24	0	0	737	21.3	0
Dark Canyon	DC1	0.06	4/4/2014	11/5/2014	216	5184	5184	20.33	0	4	2345	45.2	3
Dark Canyon	DC2	1.9	4/4/2014	11/5/2014	216	5184	5184	24.74	0	307	1704	32.9	29
Grande Ronde River	GR1	176.2	4/17/2014	11/10/2014	208	4992	4992	29.15	191	826	1557	31.2	55
Grande Ronde River	GR3	174.7	5/16/2014	11/12/2014	211	5041	5041	29.56	309	949	1048	20.8	59
Grande Ronde River	GR4	194.23	4/15/2014	10/15/2014	184	4416	4416	26.29	37	523	1461	33.1	38
Grande Ronde River	GR5	199.7	4/15/2014	10/15/2014	184	4416	4416	20.42	0	6	1452	32.9	0
Grande Ronde River	GR6	202.3	4/15/2014	10/15/2014	184	4416	4416	18.05	0	0	1450	32.8	0
East Fork Grande Ronde	GR7	0.05	4/15/2014	10/15/2014	184	4416	4416	16.90	0	0	1546	35.0	0
Grande Ronde River	GR8	203.02	4/15/2014	10/15/2014	184	4416	4415	20.90?	0	1	1450	32.8	0
Grande Ronde River	GR9	182.5	4/15/2014	11/10/2013	152	3648	3648	28.36	72	303	1136	31.1	25
Grande Ronde River	GR10	169.6	4/17/2014	11/11/2014	195	4632	4653	29.25	306	1229	831	21.7	49
McCoy Creek	MCCOY1	2.7	4/4/2014	11/5/2014	216	5161	5161	28.16	113	763	1591	30.8	50
McCoy Creek	MCCOY6	1.5	4/4/2014	9/14/2014	160	3827	3816	28.06	104	781	1079	28.3	53
McCoy Creek	MCCOY7	0.1	4/4/2014	11/5/2014	216	5184	5184	28.36	136	904	1629	31.4	56
Meadow Creek	MEADOW1	2.9	4/17/2014	11/4/2014	202	4848	4848	30.76	267	970	1491	30.8	60
Meadow Creek	MEADOW2	1.5	7/8/2014	11/4/2014	120	2880	2880	28.85	145	754	779	27.0	51
Meadow Creek Wetland	MEADOW3	1.06	4/4/2014	6/17/2014	75	1794	1776	0	0	0	0	0	0

Meadow Creek Wetland	MEADOW4	.17	4/4/2014	7/27/2014	115	2760	2760	25.61	11	319	1038	37.6	13
Meadow Creek	MEADOW5	7.53	4/4/2014	11/5/2014	216	5184	5184	29.25	174	789	1554	30.0	53
Meadow Creek	MEADOW6	6.77	4/4/2014	11/5/2014	216	5184	5184	29.15	164	848	1535	29.6	55
Rock Creek	ROCK1	0.23	4/16/2014	11/10/2014	209	5015	5015	38.49	458	989	1592	31.7	51
Rock Creek	ROCK2	1.7	4/23/2014	9/7/2014	138	3312	3312	32.5	66	682	1063	32.1	47
Rock Creek	ROCK3	3	4/23/2014	7/18/2014	86	2064	2064	27.57	34	185	854	41.4	10
Rock Creek	ROCK4	4.5	4/23/2014	11/12/2014	172	4128	4128	23.77	18	93	1910	46.3	5
Graves Creek	GRAVES1	.5	4/23/2014	11/12/2014	204	4896	4896	25.61	5	216	2071	42.3	17
Catherine Creek	CC37LOWER	36	4/22/2014	11/10/2014	203	4872	4872	23.97	0	364	1667	34.2	36
Catherine Creek	CC37UPPER	37	4/22/2014	11/09/2014	202	4848	4848	23.2	0	303	1714	35.4	36
Catherine Creek	CC44LOWER	40	4/16/2014	11/9/2014	208	4992	4992	23.2	0	259	1705	48.2	24
Catherine Creek	CC44RICKER	38	4/16/2014	11/9/2014	208	4992	4992	23.77	0	292	1708	34.2	28
Catherine Creek	CC44UPPER	44	4/16/2014	11/9/2014	208	4992	4992	23.2	0	162	1732	34.7	8

Land Acquisition Planning

Staff continued land acquisition planning under the CTUIR-BPA Accord Land Acquisition Project to identify and develop opportunities to protect key spawning and rearing habitat for Chinook and steelhead in the Upper Grande Ronde Subbasin.
Work consisted of:

- Communicating with real estate agents to identify land parcels currently and prospective on the market along the main stem Grande Ronde River, Meadow Creek, Catherine Creek, and Lookingglass Creek.
- Documentation of limiting factors, and preparation of prioritization criteria checklists consistent with the land acquisition strategy developed by the CTUIR and reviewed by the ISRP.
    - Several project prospects were identified and screened through the prioritization criteria. Internal coordination within the CTUIR government and fisheries program as well as coordination with BPA, landowners, and real estate agents is ongoing prior to development of a final list of projects that will be proposed for further assessment and prioritization.

  Following is a list of potential land/easement acquisition projects that are currently under review.

Joseph Cunha Ranch, LLC Perpetual Conservation Easement

Project staff worked with ODFW and the Rocky Mountain Elk Foundation (RMEF) on the planning and acquisition justification document for the Joseph Cunha Ranch, LLC Perpetual Conservation Easement. The RMEF were not able to continue with acquisition of the easement, therefore CTUIR engaged the Blue Mountain Land Trust (BMLT) to continue the process.

The project is located near Starkey, Oregon in Township 3 South, Range 35 East of the Willamette Meridian on portions of Sections 24, 25, and 36, Union County Tax Lot 500. The project encompasses approximately 2,928 acres of mixed coniferous forest, native grasslands, forested and shrub-scrub wetlands and riparian habitat along approximately 2.0 miles of Dark Canyon Creek and 1.0 mile of Meadow Creek. The project proposal is to purchase a perpetual conservation easement (CE) on the Joseph Cunha Ranch, LLC in the Upper Grande Ronde Subbasin. The CE will permanently protect 3 miles of critical habitat for Threatened Snake River Basin spring-summer Chinook salmon and summer steelhead along Meadow Creek and Dark Canyon Creek. Nearly 3,000 acres of critical big game winter range and a significant big game migration corridor in Oregon's Starkey Big Game Management Unit will be protected from future development and subdivision while providing opportunities to restore and enhance high quality instream, riparian, wetland, and upland forest and native grasslands. The property provides habitat for at least 20 Oregon listed sensitive species and one federal candidate wildlife species. An estimated half a million dollars (one third of the market value) is needed to secure the easement. Multiple funding sources are being sought by project sponsors to secure the conservation values of the property with cost sharing between the CTUIR Ceded Area Priority Stream Corridor Conservation and Protection Project/CTUIR-BPA Accord, Blue Mountain Land Trust and other conservation and user groups.

The Cunha Ranch easement is moving through the final due diligence process with BPA and expected to close and be finalized by late spring 2015.

Southern Cross Ranch

This 545-acre ranch includes .75 miles of Catherine Creek, approximately 78 acres of pasture/floodplain adjacent to Catherine Creek, and 3.78 acres of Palustrine Emergent wetlands. The majority of the Property has been in agricultural production throughout the ranch's history. The lower floodplain/riparian has been grazed by livestock and been used in hay production, the uplands have been grazed by livestock. The property has important conservation values for potential non-structural storage of floodwater, improved wetland and riparian habitats, increased hyporheic groundwater exchange, increased juvenile Chinook and Steelhead rearing habitat, improved adult Chinook and Steelhead spawning habitat, and improved upland deer and elk habitat. In 2013, Western Rivers purchased the ranch. The CTUIR Ceded Area Priority Stream Corridor Conservation and Protection Project/CTUIR-BPA Accord plans to purchase Ranch in 2015 for the CC44 Phase III Project implementation.

The Southern Cross Acquisition is moving through the final stages of due diligence in BPA's real estate program and expected to close late spring 2015. Remaining work includes finalizing easement and stewardship plan.

Vey Ranch

The Vey Ranch is a key property in the Upper Grande Ronde Subbasin that has long been sought to restore spring-summer Chinook in the Grande Ronde. The property includes 36.75 miles of spawning and rearing habitat and 13,567 acres. All life stages of Threatened Snake River ESU spring-summer Chinook salmon, summer steelhead, and fluvial Bull Trout occur on the property. Limiting factors include excess fine sediment; water quantity (low summer flow); water quality (high summer water temperatures, pH); lack of habitat quantity/diversity (pools and large wood); degraded riparian conditions; winter icing, and fish passage. The likelihood of a potential project is very low.

Several attempts to communicate with landowner and initiate discussions to secure an easement or fee title acquisition have been unsuccessful. For the near term, this potential conservation property is uncertain and no further actions are planned until owner indicates an interest.

Lookingglass Creek

This property includes 2.34 miles of main stem Lookingglass Creek upstream from the Lookingglass fish hatchery. The property is currently on the real estate market and includes approximately 663 acres for an estimated $1.8 million. The property includes mixed conifer forest, native grasslands, and riparian/wetland (forest/scrub-scrub/emergent) (123 acres). All life stages of Threatened Snake River ESU spring-summer Chinook salmon (functionally extirpated, efforts underway to reintroduce natural populations), summer steelhead and bull trout. Limiting factors include fish passage/habitat access, habitat quantity/diversity (low pool frequency, lack of diversity, substandard stream-bank conditions), excess fine sediment, water quantity (especially low summer flows), channelization, degraded riparian condition, lack of floodplain connectivity, lack of spawning gravels, predation, poor water quality (high summer temperatures).

The Lookingglass Acquisition recently picked up momentum after the owner agreed to accept the appraised value established by landowner funded appraisal completed during summer 2014. BPA real estate is currently reviewing appraisal and the CTUIR is preparing to secure the property with CTUIR bridge funding while BPA completes remaining due diligence activities. The property is expected to be secured by the CTUIR under the Accord by late spring 2015.

Main stem Grande Ronde River (Starkey Reach)

This property includes 0.31 miles of main stem Grande Ronde River and 10.4 acres near Starkey, Oregon. Estimated land acquisition cost would be $70,000. Property includes habitat for all life stages of Threatened Snake River ESU spring-summer Chinook salmon and summer steelhead. Passage and overwinter habitat for Threatened fluvial Bull Trout is also present within the property. Limiting factors include excess fine sediment, water quantity (low summer flow), water quality (high summer water temperatures), lack of habitat quantity/diversity (pools and large wood), and degraded riparian conditions.

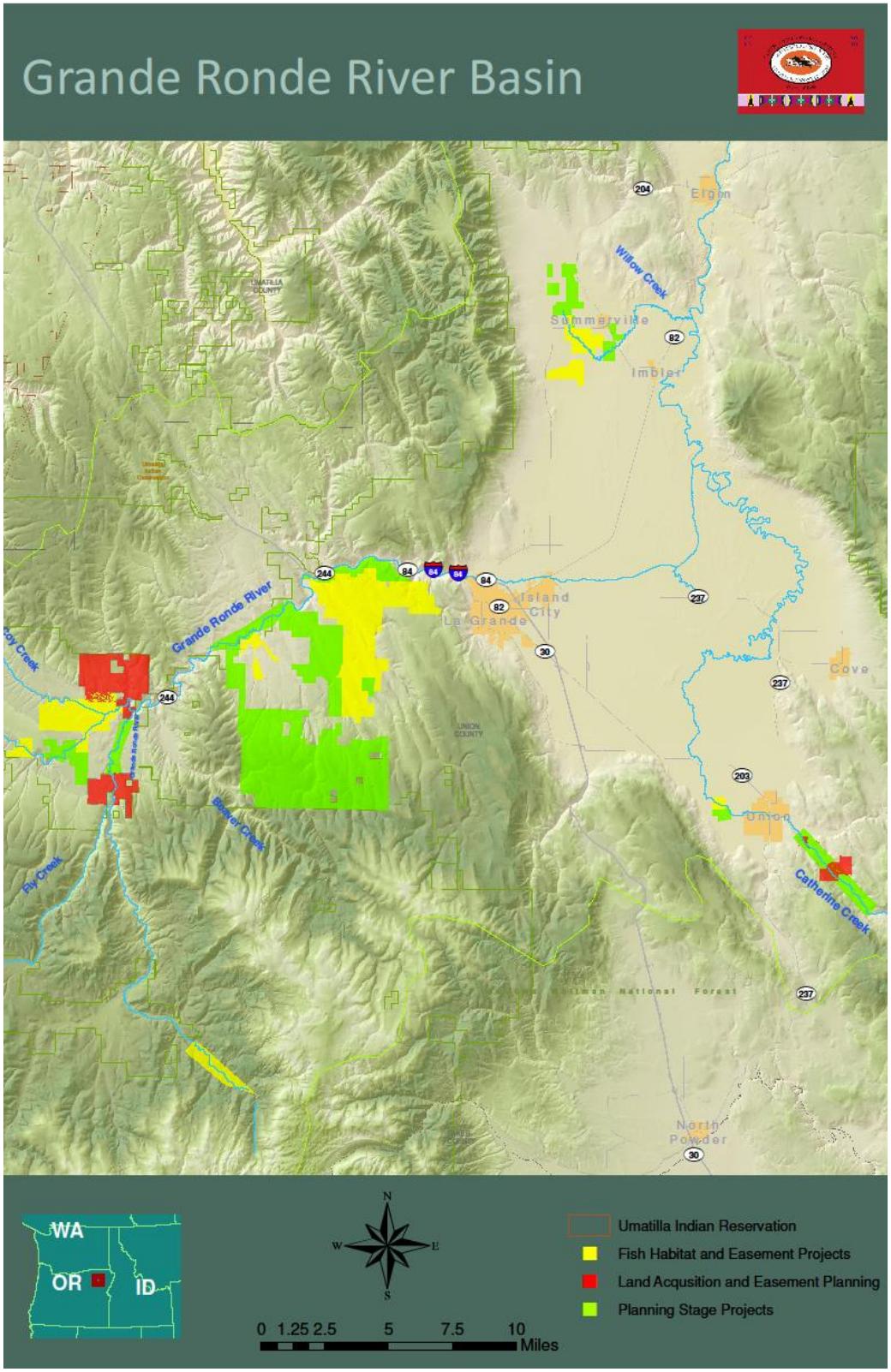
Property has been appraised, but landowner has elected to not accept the valuation. No further pre-acquisition activities are planned until the landowner re-engages. Property is currently listed for sale for value greater than appraised value.

Main stem Grande Ronde River and Warm Springs Creek

Property includes 0.76 miles of main stem Grande Ronde River and 1 mile of Warm Springs Creek and a total of 1,266 acres upstream from Starkey, Oregon. Property provides habitat for all life stages of Threatened Snake River ESU spring-summer Chinook salmon and summer steelhead with passage and overwinter habitat for fluvial Bull Trout. Limiting factors include excess fine sediment, water quantity (low summer flow), water quality (high summer water temperatures), lack of habitat quantity/diversity (pools and large wood), and degraded riparian conditions.

Property has been appraised, but landowner has elected to not accept the valuation. No further pre-acquisition activities are planned until the landowner re-engages. CTUIR staff continues to work with landowner on conservation and habitat restoration planning utilizing NRCS CREP program easements and Accord fish habitat funds. CTUIR is working with BOR for engineering services and are developing a fish habitat enhancement project along the mainstem Grande Ronde River which is scheduled for construction in 2016.

FIGURE 50 CTUIR GRANDE RONDE SUBBASIN LAND ACQUISITION PLANNING OVERVIEW MAP.



Summary of Expenditures

The following figure illustrates the budget for the project during the period May 1, 2013 through April 30, 2014. The final budget is pending close out of all invoices and billings and will be updated by the CTUIR accounting department following contract closure within 30 days of the contract end data.

The following budget expenditure summary does not include remaining billable items that CTUIR is awaiting invoicing, primarily associated with subcontracted items for the Rock Creek Fence and an agreement with UCSWCD associated with irrigation efficiency improvement projects on the Catherine Creek (CC44) project. Final billings will large expend remaining funds in the subcontract line item.

FIGURE 51 EXPENDITURES FOR FY 2014

Confederated Tribes of the Umatilla Indian Reservation
R & E with Comm - Grant Period
Fiscal year thru period ending April 30, 2015

488 014 - BPA Grande Ronde Subbasin Restoration 5/01/14 - 4/30/15	Current Month Actual	Year to Date Actual	Open Purchase Orders	Total Committed	Total Budget	Variance	% Used
Revenues							
488 014 4010 Grant/Contract Income	1,074,276.94	1,074,276.94	0.00	1,074,276.94	1,424,730.00	(350,453.06)	-75.40
Total Revenues	**1,074,276.94**	**1,074,276.94**	**0.00**	**1,074,276.94**	**1,424,730.00**	**(350,453.06)**	**-75.40**
Direct Expenses							
488 014 5000 Salaries & Wages	305,249.77	305,249.77	0.00	305,249.77	289,585.00	(15,664.77)	105.40
488 014 5010 Fringe Benefits	99,244.57	99,244.57	0.00	99,244.57	92,926.00	(6,318.57)	106.80
488 014 5101 Travel-Per Diem	3,403.12	3,403.12	0.00	3,403.12	3,302.00	(101.12)	103.10
488 014 5150 Training	3,720.00	3,720.00	0.00	3,720.00	3,950.00	230.00	94.20
488 014 5160 Auto Insurance	1,628.83	1,628.83	0.00	1,628.83	1,905.00	276.17	85.50
488 014 5190 Vehicle Expense	17,756.97	17,756.97	0.00	17,756.97	19,545.00	1,788.03	90.90
488 014 5210 Supplies	0.00	0.00	0.00	0.00	587.00	587.00	0.00
488 014 5225 Materials	18,594.31	18,594.31	4,820.23	23,414.54	35,296.00	11,881.46	66.30
488 014 5226 Books/Journals	0.00	0.00	0.00	0.00	500.00	500.00	0.00
488 014 5250 Non Capital Equipment	2,199.20	2,199.20	0.00	2,199.20	2,500.00	300.80	88.00
488 014 5400 Communications	1,342.85	1,342.85	431.53	1,774.38	4,800.00	3,025.62	37.00
488 014 5410 Postage & Freight	78.21	78.21	0.00	78.21	300.00	221.79	26.10
488 014 5430 Dues & Subscriptions	973.79	973.79	0.00	973.79	946.00	(27.79)	102.90
488 014 5432 Permits & Lisc.	0.00	0.00	30.00	30.00	90.00	60.00	33.30
488 014 5440 Equipment Rental	1,247.24	1,247.24	0.00	1,247.24	5,000.00	3,752.76	24.90
488 014 5441 Computer Lease	2,760.89	2,760.89	0.00	2,760.89	2,903.00	142.11	95.10
488 014 5450 Printing & Duplication	0.00	0.00	0.00	0.00	500.00	500.00	0.00
488 014 5470 Repairs & Maintenance	2,021.20	2,021.20	0.00	2,021.20	3,000.00	978.80	67.40
488 014 5480 Advertising	0.00	0.00	0.00	0.00	200.00	200.00	0.00
488 014 5770 Professional Services	0.00	0.00	0.00	0.00	2,700.00	2,700.00	0.00
Sub-Total	**460,220.95**	**460,220.95**	**5,281.76**	**465,502.71**	**470,535.00**	**5,032.29**	**98.90**
Pass-through Expenses							
488 014 6100 Subcontract fees	494,804.88	494,804.88	59,339.23	554,144.11	747,773.00	193,628.89	74.10
Sub-Total	**494,804.88**	**494,804.88**	**59,339.23**	**554,144.11**	**747,773.00**	**193,628.89**	**74.10**
Cost of Goods Sold							
488 014 8500 Indirect	177,267.92	177,267.92	0.00	177,267.92	206,422.00	29,154.08	85.90
Total Expenses	**1,132,293.75**	**1,132,293.75**	**64,620.99**	**1,196,914.74**	**1,424,730.00**	**227,815.26**	**84.00**
Net Difference	(58,016.81)	(58,016.81)	(64,620.99)	(122,637.80)	0.00	(122,637.80)	0.00

Lessons Learned/Adaptive Management

The Grande Ronde Subbasin is one example of efforts to learn and adapt management programs through time. Historically, basin partners developed projects in an opportunistic approach. Projects were largely identified and developed with willing landowners based on course scale planning established through the Grande Ronde Subbasin plan completed in 2004. In 2013, basin partners initiated a strategic planning process (ATLAS) for Catherine Creek and the upper Grande Ronde watershed based on salmon and steelhead life history requirements to stratify the watersheds by biological significant reaches, assign relative importance of limiting factors, define key actions to address limiting factors, and develop a ranking and prioritization system to clearly identify geographic and reach priorities and both short and long term strategies to focus watershed restoration actions in areas with the most biological need and the highest probability of benefit. The process engaged multiple basin partners and leveraged the best available science and local expertise available to develop a road map that all partners can utilize to identify, develop, and implement strategic watershed and fish habitat restoration and enhancement projects. Transitioning opportunistic to strategic planning may be one of the most important adaptive management changes employed in the basin for prioritizing and strategizing work in Catherine Creek and the Grande Ronde river to address survival gaps for Snake River Spring-Summer Chinook and Summer Steelhead populations in the Grande Ronde Subbasin.

Additionally, the CTUIR Grande Ronde Fish Habitat Project continues to monitor and evaluate performance of projects and conservation measures developed to improve watershed and fishery resources in the Grande Ronde Subbasin. Post project construction and monitoring data, along with staff experience and collaboration with basin partners, collectively informs and helps improve our understanding of how different techniques and approaches to watershed and habitat restoration respond as well as develop new and innovative approaches to addressing habitat limiting factors for salmon and steelhead populations.

Literature Cited

Anderson, J.W., and others. 1992. Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration, and Monitoring Plan. USFS, PNWFRS, ODFW, CRITFC, CTUIR, NPT, OSU.

CBFWA. 1990. Columbia Basin Fish and Wildlife Authority. Integrated System Plan for Salmon and Steelhead Production in the Columbia River Basin.

CRITFC. 1995. Wykan Ush Me Wa Kush, Spirit of the Salmon. Columbia River Basin Salmon Policy. Columbia River Inter-Tribal Fish Commission. Columbia Basin Salmon Policy, 1995.

CTUIR. 1983. Confederated Tribes of the Umatilla Indian Reservation. Summary Report: Salmon and steelhead habitat improvement initiatives--John Day, Umatilla, Grande Ronde and Imnaha drainages.

Grande Ronde Model Watershed Program, et., al. 2004. Grande Ronde Subbasin Plan. Northwest Power Planning Council Fish and Wildlife Program.

Henjum, M. G., J.R. Karr, D. L. Bottom, D. A. Perry, J. C. Bennarz, S. G. Wright, S. A. Beckwitt and E. Beckwitt. 1994 Interim Protection for Late-Successional Forest, Fisheries, and Watersheds: National Forest East of the Cascade Crest, Oregon and Washington.

Huntington, C. H. 1993. Clearwater BioStudies. Final Report. Stream and Riparian Conditions in the Grande Ronde Basin. Grand Ronde Model Watershed Operations-Action Plan, Appendix A and B.

Impendent Scientific Group. 1996. Return to the River: Restoration of Salmonid fishes in the Columbia River Ecosystem. September 1996.

McCullough, D. A. 1999. A review and synthesis of effects of alterations to the water temperature regime on freshwater life stages of salmonids, with special reference to Chinook salmon. Environmental Protection Agency 910-R-99-010.

McIntosh, B.A., J.R. Sedell, J.E. Smith, R.C. Wismar, S.E. Clarke, G.H. Reeves, and L.A. Brown. 1994. Management history of eastside ecosystems: Changes in fish habitat over 50 years, 1935-1992. General Technical Report, PNW-GTR-321, Report. USDA, Forest Service

Mobrand, L. and L. Lestelle. 1997. Application of the ecosystem diagnosis and treatment method to the Grande Ronde Model Watershed Project. BPA Task Order Number 95AT61148.

Mobrand, L. 2003. Application of the Ecosystem Diagnosis and Treatment Method to the Grande Ronde Subbasin.

CBFWA. (1990). Integrated System Plan for Salmon and Steelhead Production in the Columiba River Basin. Columbia Basin Fish and Wildlife Authority.

CRITFC. (1995). Wykan Ush Me Wa Kush, Spirit of the Salmon. Culumbia River Inter Tribal Fish Commission.

CTUIR. (1983). Summary Report: Salmon and steelhead habitat improvement initiatives--John Day, Umatilla, Grande Ronde and Imnaha drainages. Confederated Tribes of the Umatilla Indian Reservation.

Huntington, C. (1993). Stream and Riparian Conditions in the Grande Ronde Basin. Grande Ronde Model Watershed.

Jones, K. L. (2008). Umatilla River Vision. CTUIR, Department of Natural Resources, Pendleton.

Mobrand, L. (2003). Application of the Ecosystem Diagnosis and Treatment Method to the Grande Ronde Subbasin. .

Newbury, R., & Gasboury, M. (1994). Stream analysis and fish habitat design: A field manual. Gibson: Newbury Hydraulics LTD.

Newbury, R., Gaboury, M., & Bates, D. (1997). Restoring habitats in channelized or uniform streams using riffle and pool sequencies. Canadian Ministry of Environment, Lands and Parks. Vancouver: Watershed Restoration Program.

NMFS. (1997). Snake River Salmon Recovery Plan (8/97 draft),. National Marine Fisheries Service.

NPCC. (2009). Grande Ronde Subbasin Plan. Northwest Power Planning and Conservation Council.

NPCCa. (2004). Grande Ronde Subbasin Plan. Northwest Power and Conservation Council.

NPCCb. (2004). Imnaha Subbasin Plan. Northwest Power and Conservation Council.

NRC. (1996). Upstream. Salmon and society in the Pacific Northwest. Washington D. C.: National Research Council.

ODFW. (1990). Past and present abundance of Snake River sockeye, Snake River chinook, and lower Columbia River coho salmon. A report prepared for Senator Mark Hatfield, U. S. Senate. Oregon Department of Fish and Wildlife.

USFWS. (2002). Bull Trout Draft Recovery Plan. U. S. Fish and Wildlife Service, U. S. Fish and Wildlife Service. U. S. Fish and Wildlife Service.

NMFS. 1997. National Marine Fisheries Service. Snake River Salmon Recovery Plan (8/97 draft), Chap.4, pg. 61, 1997.

NMFS. 1995. National Marine Fisheries Service. Snake River Salmon Recovery Plan.

Noll, W., Williams, S., and R. Boycce. 1988. Grande Ronde river basin fish habitat improvement implementation plan. Oregon Department of Fish and Wildlife.

Nehlsen, W., J. E. Williams, and J. A. Lichatowich. 1991. Pacific salmon at the crossroads: stocks at risk from California, Oregon, Idaho, and Washington. Fisheries Bulletin, American Fisheries Society, Bethesda, Maryland.

NPCC. 1994. Columbia River Basin Fish and Wildlife Program. Northwest Power Conservation Council.

NPPC. 2001. Grande Ronde River Subbasin Summary. Northwest Power Conservation Council.

NPCC. 2004a. Grande Ronde Subbasin Plan. Prepared for Northwest Power and Conservation Council by Grande Ronde Model Watershed Program. Pgs. 491. Available from www.nwcouncil.org/fw/subbasinplanning/granderonde/plan/

NPCC. 2004b. Imnaha Subbasin Plan. Prepared for Northwest Power and Conservation Council by Wallowa County Natural Resources Advisory Committee. Paged by section. Available from www.nwcouncil.org/fw/subbasinplanning/imnaha/plan/

NPCC. 2004c. Grande Ronde Subbasin Plan Supplement. Prepared for Northwest Power and Conservation Council by Grande Ronde Model Watershed Program. Pgs. 51. Available from www.nwcouncil.org/fw/subbasinplanning/granderonde/plan/

NPCC. 2004d. Imnaha Subbasin Plan Supplement. Prepared for Northwest Power and Conservation Council by Wallowa County Natural Resources Advisory Committee. Pgs. 20. Available from www.nwcouncil.org/fw/subbasinplanning/imnaha/plan/

NPPC. 2000. Columbia River Basin Fish and Wildlife Program. Portland, OR. Available from www.nwcouncil.org/library/2000/2000-19/Default.htm

NRC. 1996. Upstream. Salmon and society in the Pacific Northwest. National Research Council, Washington D.C. 452 pp.

ODEQ. 1999. Grande Ronde Section 319 National Monitoring Program Project. Temperature Monitoring Summary Report, 1993-1998. Oregon Department of Environmental Quality.

ODFW, 1990. Oregon Department of Fish and Wildlife and National Marine Fisheries Service. 1990. Past and present abundance of Snake River sockeye, Snake River chinook, and lower Columbia River coho salmon. A report prepared for Senator Mark Hatfield, U. S. Senate.

ODFW, 1990. Oregon Department of Fish and Wildlife and four other agencies. 1990. Grande Ronde River Subbasin, salmon and steelhead production plan. Northwest Power Planning Council, Portland, Oregon.

ODFW, 1996. Oregon Department of Fish and Wildlife. 1996. Grande Ronde Basin Fish Habitat Enhancement Project. 1996 Annual Report.

Rosgen, D., 1996 Applied river morphology. Wildland Hydrology, Pagosa Springs, Colorado.

Rosgen, D.L. 1998. The reference reach – a blueprint for natural channel design. Presented at the ASCE, Denver, Co

Thurow, R.F. 1994. Underwater Methods for Study of Salmonids in the Intermountain West. General Technical Report. Ogden, UT: US Department of Agriculture, Forest Service, Intermountain Research Station.

USFS et., al. 1992. Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration, and Monitoring Plan, USFS, PNFRES, ODFW, CRITFC, CTUIR, NPT, OSU.

USFWS. 2002. Bull Trout Draft Recovery Plan. U. S. Fish and Wildlife Service. Paged by section. Available from http://ecos.fws.gov/docs/recovery_plans/2002/021129.pdf

White, S., C. Justice, and D. McCullough. 2011. Protocol for Snorkel Surveys of Fish Densities. A component of Monitoring Recovery Trends in Key Spring Chinook Habitat Variables and Validation of Population Viability Indicators. Columbia River Inter-Tribal Fish Commission, Portland, OR.

Yanke, J. A., B. C. Jonasson, F. R. Monzyk, S. M. Nesbit, A. G. Reischauer, E. S. Van Dyke, R. W. Carmichael. 2004. Investigations into the Early Life History of Naturally Produced Spring Chinook Salmon and Summer Steelhead in the Grande Ronde River Subbasin. 2003 annual report. On file with Oregon Department of Fish and Wildlife, La Grande, Oregon