From the Archives

The Union County Courthouse

by Lacey Moore, GRMW

AS DISCUSSIONS CONTINUE REGARDING THE FUTURE OF THE UNION COUNTY COURTHOUSE, IT SEEMS APPROPRIATE THAT WE RECALL THE LONG AND COLORFUL HISTORY ASSOCIATED WITH THE RESIDENCE OF UNION COUNTY'S GOVERNING BODY.

TIMELINE

1864 — UNION COUNTY WAS PARCELED OFF FROM BAKER COUNTY BY THE GOVERNOR OF OREGON. LA GRANDE WAS APPOINTED THE TEMPORARY COUNTY SEAT, A DECISION EXTENDED BY A LOCAL ELECTION. AT THE TIME, A COURTHOUSE WAS LOCATED AT 602 B AVENUE IN LA GRANDE. THIS BUILDING WAS DEMOLISHED IN 1966.

1874 — IN A SUBSEQUENT ELECTION, THE CITY OF UNION WAS APPOINTED THE NEW COUNTY SEAT. THE COURTHOUSE WAS THEN MOVED TO A TEMPORARY SPACE IN UNION.

1878 — THE CITY OF UNION BUILT A COURTHOUSE, LOCATED WHERE UNION HIGH SCHOOL NOW RESIDES. THE BRICK BUILDING THAT HELD THE JAIL IS STILL INTACT BEHIND THE PRESENT-DAY SCHOOL.

1904 — YET ANOTHER ELECTION WAS HELD TO DECIDE THE COUNTY SEAT, NOT LONG AFTER A SOUTHERN SECTION OF UNION COUNTY WAS REALLOCATED BACK TO BAKER COUNTY. LA GRANDE WON THIS CONTEST, AND THE COURTHOUSE WAS MOVED TO THE NEWLY BUILT LA GRANDE CITY HALL BUILDING LOCATED ON THE BLOCK OF 5TH STREET AND L AVENUE.

1928 — THE UNION COUNTY COURTHOUSE BURNED AFTER A FIRE STARTED IN THE ATTIC. DELIBERATIONS TOOK PLACE OVER THE NEXT SEVERAL MONTHS OVER WHETHER TO BUILD AN ENTIRELY NEW STRUCTURE. IN THE END, A CONTRACT WAS ISSUED TO REPAIR THE EXISTING COURTHOUSE.

1986 — THE COURTHOUSE MOVED ACROSS K AVENUE TO THE PRESENT-DAY LOCATION IN THE ST. JOSEPH HOSPITAL BUILDING, WHICH WAS BUILT IN 1937.

1997 — THE UNION COUNTY TAX ASSESSOR OFFICE WOULD LATER MOVE WHEN THE COURTHOUSE BUILDING WAS CONDEMNED IN 1996 AND THEIR NEW BUILDING CONSTRUCTED ON 4TH STREET, AFTER WHICH THE OLD COURTHOUSE AT 5THE STREET AND L AVENUE WAS DEMOLISHED.

2014 — A DECISION WAS MADE AT THE COUNTY COMMISSIONER'S MEETING ON MARCH 5, 2014 TO CONSTRUCT A NEW COURTHOUSE ON THE BLOCK OF 5TH AND L, NEXT TO THE EXISTING JAIL.

This newsletter is funded by the Bonneville Power Administration and the Oregon Watershed Enhancement Board

Grande Ronde Model Watershed

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Ripples in the Grande Ronde

Spring 2014

RIVERS UNITING NEIGHBORS·QUARTERLY NEWS FROM THE GRANDE RONDE MODEL WATERSHED

Why Salmon Redds Count

by Jeff Yanke, ODFW Biologist

After her grueling upstream journey, a female salmon noses into her natal tributary guided by the last spring flows. As the water drops, she gradually moves upstream toward spawning and rearing reaches she has not seen in two long years. When the natural urge comes, she searches for the perfect combination of depth, flow, and streambed material in which to lay her eggs. Once the spot is carefully selected, she uses the very last of the energy that carried her 800 miles and over eight dams to find a mate with which to spawn.

As she beats the streambed into submission with her powerful tail, loose gravel and fine materials are cleared from the worksite. She works deeper and deeper, unearthing softball-sized pieces of basalt and granite. When a lucky male joins her, eggs are released and fertilized into spaces she created between cobble-sized rocks. The couple moves inch by inch upstream, covering the deposits of fertilized eggs with clean gravel as they go. When complete, she leaves behind a large, chrome-bright pit a few feet deep and the size of a small car. At the downstream end lies a brightly polished pile of tailings. This structure, called a "redd," marks the culmination of her life and begins the cycle anew.

This instinctual performance takes place nearly year-round among native trout and salmon species in the Grande Ronde and Imnaha River basins. Steelhead build diversely shaped redds in small tributaries across the basin from March until June. Kokanee in Wallowa Lake make small colonies of redds in river shallows in September and in unknown shoreline areas into December. In October, small resident bull trout construct tortilla-sized redds made of small granite particles high in the Wallowa Mountains. Massive fall Chinook move ancient rock deep under the Snake River in November. Because they are a visual sign of the very act of reproduction, the amount of redds is an excellent indicator of population abundance. Simply put, more redds = more fish.

Therefore, counting redds has long been a standard method for tracking fish abundance. Redds determine whether a species of interest is present in a stream reach and can track population abundance over time. With semelparous (fish that spawn and die) species, redd counts also offer an opportunity to sample carcasses. The marks, measurements, scales, and tissue samples from each carcass are an offensive-smelling treasure trove of precious data to a biologist.

Continued on page 6

ABOVE: Ian Wilson with the Nez Perce Tribe proudly displays a large Chinook salmon carcass from the Imnaha River before harvesting its precious data. Photo courtesy of Jeff Yanke, ODFW.

Habitat Restoration & Commercial Agriculture

A Balancing Act

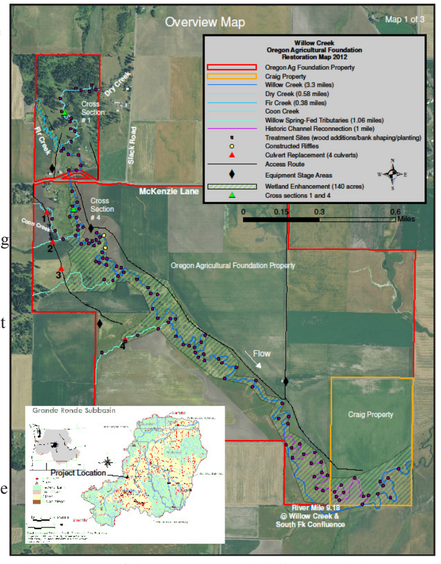
by Jeff Oveson, GRMW

Many people living in northeastern Oregon will immediately recognize the name Glen McKenzie. He and his wife, Jean, were long-time landowners and farmers along Willow Creek near Summerville, known by many as generous benefactors of Oregon State University, Eastern Oregon University (EOU), and a variety of other institutions and causes in which they believed. One of their more significant contributions was the very land they had lived on and made a living on until their passing, Jean in 1993 and Glen in 2006. By way of a small disclaimer, I had the pleasure of knowing the McKenzie family from the time I was a youngster growing up in Wallowa County and had come to think of Glen as his own sort of Renaissance Man.

In early 2008, Oregon Agricultural Foundation (OAF) Board President Bill Howell, who at the time was also a member of the Grande Ronde Model Watershed (GRMW) Board, invited me to take a tour of the McKenzie property. Bill and I spent a couple of leisurely hours wandering around the farm as Bill told me about the current operation and reminded me that Glen realized late in life that there were opportunities to improve habitat and water quality in Willow Creek and that he viewed it as a responsibility. Bill and I talked about building a working relationship between the GRMW and OAF, and he invited me to start attending quarterly OAF board meetings (meetings graciously hosted by EOU Vice President Tim Seydel and Management Analyst Lara Petitclerk). Although Bill Howell is the President, Glen's nephew, Howard Hansen, of Beaverton handles most of the primary administrative duties of the OAF.

It immediately became apparent that OAF board members, most of whom are retired agriculturalists, wanted to balance habitat restoration with commercial agriculture while continuing their significant financial contributions to the Eastern Oregon University Foundation (EOUF), contributions that take the form of scholarships to EOU students.

OAF made the decision to liquidate livestock and equipment and then lease the farm lands to two local farmers, Randy Glenn and Roben Arnoldus. OAF also wanted to examine options to include the restored area in an easement (whether private or public, short- or long- term) and to consider the restrictions and advantages of an easement. Together, we explored the concepts of easements, met with a couple of land trusts, and started leaning toward the federal easements that are part of the federal Farm Bill, the Wetland Reserve Program (WRP), and the Conservation Reserve Enhancement Program (CREP). Both programs are administered by the Farm Services Administration (FSA) with technical support from the Natural Resources Conservation Service (NRCS).



ABOVE: Map of the McKenzie and Willow Creek Project. Provided by Allen Childs, CTUIR

After a few meetings with OAF, habitat restoration experts Allen Childs of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and Vance McGowan of the Oregon Department of Fish and Wildlife (ODFW) joined the partnership. Together and separately, Childs, who runs the CTUIR's Grande Ronde Subbasin Restoration Project, and McGowan, who at the time was in charge of the ODFW's Blue Grande Ronde Fish Habitat Improvement Program, had completed numerous successful habitat restoration projects. Although both programs are funded primarily by the Bonneville Power Administration Fish and Wildlife Program (BPA), many of the projects they have implemented have been principally funded through the GRMW with BPA Fish and Wildlife Program funding. Childs and McGowan met several times with OAF members, gradually assessing the individual and collective desires and blending the compulsory project elements with the optional. Childs and his crew would become the project leads, with support from McGowan and his crew.

As a vision for the property began to take shape, Childs and McGowan started going through the mandatory pre-project checklist of permits and consultations required by federal and state agencies to protect archeological artifacts, water, soil, and endangered species. Childs and McGowan's crew completed topographic surveys of the property and conducted habitat assessments of the project area. The conclusions were about what we expected: "Poor streambank stability and severe bank erosion, channel incision and head cutting in localized reaches, straightened reaches resulting in loss of sinuosity high channel width:depth ratios, lack of floodplain connectivity, poor groundwater interaction,

Meet the Board

Emily Spang

by Jeremy McCulloch, Advisor, Wallowa FFA

Emily Spang is an exceptional young lady. She is the daughter of Derek and Julie Spang and has one older brother, Glen. She has grown up in the small community of Wallowa, Oregon, and has been heavily involved in agriculture for her entire life. Emily operates a flock of more than 30 sheep as part of her FFA-supervised agricultural experience project and has enjoyed great success with her enterprise. Her projects keep her very busy, but Emily also enjoys volleyball, softball, and outdoor activities. Emily has served as an FFA officer during all four years of her high school education, the last two as Wallowa FFA Vice-President and the Chapter President. Emily has been a Chapter Star award recipient during all four years in high school, with Star in Agribusiness awards as a freshman and sophomore and Star Farmer awards as a junior and senior. Emily also received her State FFA Degree in March 2013 as a junior, only one of three students to receive the honor in more than 30 years of history at Wallowa High School. Emily has been instrumental in resurrecting the Agriculture program at Wallowa High School. As a charter member, she has been a key figure in bringing back the program after an absence of nearly 30 years. Emily's FFA accomplishments are many, but her biggest contribution has been mentoring and helping other students with projects and bringing the program's numbers to an all-time high of 73 members during her senior year as Chapter President.

Emily was interested in becoming a Grande Ronde Model Watershed student member because she has been very involved in agriculture in Wallowa County since a young age. Emily already has witnessed first-hand the importance of water in Wallowa County. She has experience with agricultural, industrial, commercial, and domestic water usage in a rural area, so she was intrigued to learn more. Also, with some prior experience with river restoration projects, she was intrigued by the management of such issues and the environment. Emily understands conservation well for such a young person and believes in sustainable practices to balance environmental impact and benefits for society. Emily has used her experience and increased knowledge gained with the Grande Ronde Model Watershed to expand classroom discussions and other projects. Emily has enjoyed her time as the student representative and is appreciative for the opportunity to have been involved.

ABOVE: Emily Spang

Emily's future plans include attending Blue Mountain Community College in Pendleton, Oregon, to begin her pursuit of degrees in both Nursing and Agricultural Science. Emily intends to remain involved in production agriculture, specifically with sheep and cattle.

Fish Online!

www.grmw.org

- Adult salmon counts at the dams
- Snake River Basin stream flows
- Snow and precipitation reports
- Habitat enhancement projects
- Meetings, activities, and events
- Past issues of *Ripples* and more!

Grande Ronde Model Watershed

Upcoming Board Meetings

The public is welcome to attend

- Tuesday, March 25: 5:00 p.m.
  Elgin Communtiy Center
  260 N. 10th Street
  Elgin, Oregon
- Tuesday, May 27: 5:00 p.m.
  Wallowa Community Center
  204 East Second Street
  Wallowa, Oregon

Meeting dates are subject to change. Please call 541-663-0570 to confirm. Thank you!

Projects on the Horizon for 2014

by Lyle Kuchenbecker, GRMW and Coby Menton, GRMW

The Grande Ronde Model Watershed (GRMW) annually solicits proposals for habitat restoration projects. Funding is provided by the Bonneville Power Administration (BPA). The GRMW received proposals for new projects in September 2013. The GRMW Technical Committee visited project sites, reviewed the proposals, and presented funding recommendations to the GRMW Board of Directors in December 2013. The following projects were approved by the Board and submitted to the BPA for funding.

Upper Grande Ronde Small Wood and Plant Protection

This project is proposed by the U.S. Forest Service La Grande Ranger District. It is located on National Forest lands on 10 miles of the Grande Ronde River above and below Vey Meadows. The objective is to enhance spring Chinook and summer steelhead habitat by improving habitat complexity, increasing the quality and quantity of pools, improving floodplain function, and improving floodplain vegetation.

Small woody debris will be inserted into 35 previously constructed large wood structures to increase in-stream habitat complexity and provide improved Chinook and steelhead juvenile rearing habitat. Additionally, woody debris will be scattered over the floodplain in selected areas to protect previously planted deciduous vegetation that is being heavily browsed by deer and elk. The project is planned for implementation in 2014 using cost-shared funds from the Forest Service and $149,892 in BPA funds.

Chicken Creek Large Woody Debris and Planting Project

This project is proposed by the U.S. Forest Service La Grande Ranger District. It is located on National Forest lands on two miles of Chicken Creek and West Chicken Creek, which are tributaries to the Grande Ronde River above Vey Meadows. The objective is to enhance spring Chinook and summer steelhead habitat by improving habitat complexity, increasing the quality and quantity of pools, improving floodplain function, improving riparian vegetation, increasing spawning gravel recruitment, and increasing floodplain water capture, storage, and release.

Large and small wood structures will be constructed in-stream at 13 sites on Chicken Creek using an excavator. 7,500 deciduous cuttings and conifer seedlings will be planted on both Chicken Creek and West Chicken Creek. Construction is planned for 2014, with planting and planting protection activities to follow in 2015 using cost-shared funds from the Forest Service and $121,249 in BPA funds.

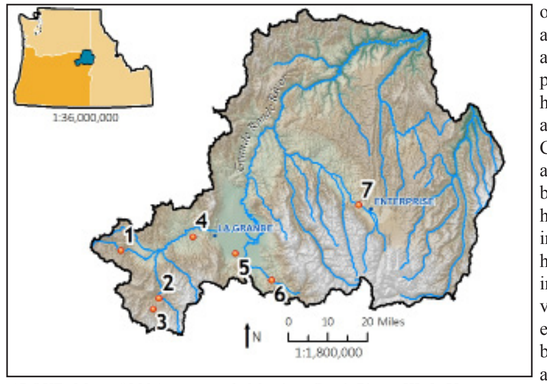
ABOVE: Shows a section of Chicken Creek lacking riparian vegetation and large wood that will be restored during this project.

Meadow Creek Upland Water Source Project Phase III

This project is proposed by the U.S. Forest Service La Grande Ranger District. It is located on National Forest lands on Meadow Creek in the Starkey Experimental Forest. This project is the final phase of a multi-phase cooperative effort involving the Forest Service, the Eastern Oregon Agricultural Research Center, the Starkey Experimental Forest, and the Oregon Department of Fish and Wildlife (ODFW). The overall project objectives are to improve Chinook and steelhead habitat as well as to determine what restoration methodology is likely to be most successful in reestablishing riparian vegetation. Prior work included construction of large wood structures, planting, and riparian pasture fencing as well as setting up a research study to assess effects of both domestic and wild ungulate grazing on riparian vegetation establishment and fish habitat restoration activities. Riparian pasture fencing constructed in Phase II resulted in limited off-stream water availability for livestock. Two new spring developments will be constructed, and three existing spring developments will be reconstructed. One pond water source will be cleaned. Spring source development involves fencing the springs and installing spring boxes and water troughs. The pond will be fenced and water will be piped to a trough. The work is planned for 2014 supported by cost-shared funds from project partners and $41,156 in BPA funds.

Catherine Creek-44 Stream and Fish Habitat Restoration Phase II

The project is proposed by the Union Soil and Water Conservation District (USWCD). It is located on Catherine Creek above Union. Several agencies, including the USWCD, the Bureau of Reclamation (BOR), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and the ODFW, have been involved in planning and designing this project. This project represents the second of a four-phase effort that will eventually involve six landowners and four miles of Catherine Creek. The overall objective is to improve spring Chinook and summer steelhead habitat by eliminating passage barriers, improving stream flows, improving in-stream habitat diversity, enhancing floodplain connectivity, improving riparian vegetation, and reducing sediment inputs to the stream.



ABOVE: Map of 2014 projects. 1. Meadow Creek Phase III, 2. Upper Grande Ronde Small Wood and Pods, 3. Chicken Creek Large Woody Debris and Planting, 4. Rock Creek Restoration Phase III, 5. Ladd Creek Bridge Replacement, 6. Catherine Creek 44 Phase II, 7. Wallowa River 6-Ranch Phase II.

Phase II restoration activities will occur on one mile of stream and include re-meandering straightened channels, reactivating historic channels, removing and relocating levees, constructing large wood structures, installing riparian planting and seeding, and protecting plantings. Phase II work is planned for 2014 with future phases continuing into 2017. Approved Phase II BPA funding is $561,435.

ABOVE: Showing one of the many eroding streambanks that will be stablized with large wood structures and planting on CC44 Phase II.

Rock Creek Restoration and Enhancement Phase II

The project is proposed by the CTUIR. It is located on private land in the Rock Creek system, a tributary of the Grande Ronde River near Hilgard. The overall objective is to restore and protect hydrologic and geomorphic processes that provide high-quality spawning and rearing habitat for Chinook, steelhead, and resident fish by reactivating the historic floodplain, increasing in-stream habitat complexity, improving riparian vegetation, encouraging long-term beaver re-colonization, and protecting improvements with conservation easements.

Phase II restoration activities will occur on 4.9 miles of Rock Creek, 0.4 miles of Little Rock Creek, and one mile of Sheep Creek. Restoration activities include installation of large wood structures at 127 sites, removal of 3,000 feet of levees, excavation of 1,600 feet of side channels, boulder placement at 14 sites, planting along 14 miles of stream, construction of 12 miles of riparian fencing, and protection of approximately 450 acres through conservation easements. Phase II work is scheduled to begin in 2014 and to be completed in 2016. Approved Phase II BPA funding is $299,595, with the CTUIR providing an additional $168,465 in cost-shared funds.

Ladd Creek Highway 203 Bridge

The project is proposed by the CTUIR. It is located on Ladd Creek adjacent to the Ladd Marsh Wildlife Management Area. In 2010, several miles of Ladd Creek were relocated from channelized ditches to a more natural, sinuous channel configuration. At the lower end of the project, Ladd Creek crossed Highway 203 through an undersized concrete box culvert, flowed in the roadside ditch between the highway and the railroad, and then crossed under the railroad. The new sinuous channel was designed in a location that would align with the railroad bridge. In 2010, money was not available to replace the undersized culvert under Highway 203. A new bridge is proposed that will provide for the reconnection of the new channels on the west side of the highway to the lower end of Ladd Creek on the east side of the highway and the railroad. The new bridge will allow the full habitat benefits of the channel reconstruction project to be realized as well as reduce flooding potential caused by the undersized culvert. Approved BPA funding is $471,826, with additional cost-shared funds provided by the CTUIR and the Oregon Watershed Enhancement Board (OWEB).

Wallowa River/6-Ranch Habitat Restoration Project 2

Located on the 6-Ranch near Enterprise, this project will restore normal river and riparian processes on 1,800 feet of the Wallowa River. The GRMW is the project sponsor. Project objectives are to reconnect the river to its historic floodplain, provide sediment transport continuity, improve water quality and hydraulic complexity, and restore riparian vegetation. These objectives will be realized through the construction of six new river meander bends and two riverside channels, implementation of a robust re-vegetation plan, and the strategic use of domestic livestock to help meet these objectives. 6-Ranch cattle will graze the restoration area following two growing seasons of rest in an effort to reduce reed canarygrass (RCG) competition. High-intensity, short-duration cell grazing in the spring has been shown to effectively reduce RCG presence, which gives native vegetation a competitive advantage. Expected biological benefits will include improved migration, rearing, and spawning habitat for Chinook salmon, summer steelhead, and bull trout. Construction will start in the summer of 2014 and be completed in the fall of 2015. The BPA will provide $300,000 toward construction with OWEB and GRMW contributing funds and in-kind services.

As an added benefit, counting redds does not require expensive or advanced equipment, just a trained eye, a notepad, and solid wading boots. This no-frills approach is perhaps the best reason why redd counts are so important to long-term trend monitoring; consistency is paramount. Because redds have been recorded in mostly the same way for decades, they provide the best evidence from the past to which we can compare the current status of our native fish.

In relation to modern field sciences, the redd survey is fairly unpretentious but not without challenges. Depending on the survey, walking in-stream for miles can be an exhausting endeavor. Tweaks, bumps, and pulls from tripping and sliding over boulders for hours take a significant toll on the surveyor. In the summer, farmer tans are typically covered in a mosaic of dirt, blood, and bruises from daily Hawthorne bushwhacks and mid-stream falls. Surveyors live under a funky, multi-layered coating of fish slime, hand sanitizer, sweat, sunscreen, and rotting salmon flesh, a combination often so offensive that spouses require us to undress on the porch before entering the house.

Despite all of the hard work involved, surveyors have the privilege of experiencing the unique natural beauty encountered throughout the Grande Ronde and Imnaha River basins. Redd surveys are conducted in a diverse array of habitats ranging from someone's backyard outside of Enterprise to deep within the Eagle Cap Wilderness along the Minam River. But wherever redds are counted, surveyors have the honor of bearing witness to an ancestral display of strength, instinct, and beauty, a true show for the ages. With each survey, we are inspired to maintain an intimate relationship with these amazing creatures in their environments in addition to the necessary but abstract relationships we maintain with them on computer screens.

Surveying the extensive amount of spawning habitats in the Grande Ronde and Imnaha basins takes a huge personnel effort. With assistance from an active and involved natural resources management community, redd surveys have become a large coordinated effort lead by the Oregon Department of Fish and Wildlife, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the U.S Fish and Wildlife Service.

ABOVE: When fresh, salmon redds contrast with the surrounding streambed, making them easy to identify. This redd was found in Butte Creek, a tributary to the Wenaha River. Photo courtesy of Jeff Yanke, ODFW.

The coordinated nature of redd surveys requires a special mention. Because our fishery resources are co-managed by state and tribal agencies and because restoration involves a diverse array of partners, the simple act of walking a stream with a colleague is an understated benefit to fishery conservation. Deep within riparian areas, away from conference calls and meeting rooms, witnessing spawning fish together provides an opportunity for surveyors to share a common passion. A long day afield, especially in adverse conditions, requires individuals to rely on each other in unexpected ways. In addition, surveyors may learn updates about each other's families, brainstorm research ideas, or discuss how to get a restoration project on the ground. As simple as it seems, having those opportunities builds partnerships and establishes the camaraderie that is so important to successful management and restoration of our native fisheries.

Undoubtedly, the most important partner in the Grande Ronde and Imnaha River basins are the private landowners. A significant amount of key spawning habitat is located on private property, and landowners graciously allow surveyors access to these habitats year after year. Without their support, important monitoring and trend data would be compromised by incomplete surveys collected only from public lands. Beyond accessing prime spawning habitat, surveying on private lands provides a direct connection for biologists to share data and information with the landowners that care for our streams and fish. Just the simple notion of allowing access is one of the best acts of stewardship a landowner can provide, and to those who do allow us to visit their lands, we are grateful.

ABOVE: Redd counts take surveyors into remote and unique places. Here, the author takes in some amazing scenery high in an undisclosed Grande Ronde basin tributary. Photo courtesy of Jeff Yanke, ODFW.

lowered water table, low summer flows, poor riparian and wetland vegetation, and high summer water temperatures."

6 primary objectives were developed:

1. *Protect habitat and improve the quality and quantity of habitat for salmonids, including adult spawning and juvenile summer and winter rearing areas.*
2. *Reduce streambank erosion rates.*
3. *Restore natural, stable stream channels and wetland habitat.*
4. *Decrease summer stream water temperatures and increase winter temperatures.*
5. *Develop a management plan that allows for the long-term recovery and protection of the stream as well as riparian and wetland habitat improvements.*
6. *Meet visual/aesthetic values by creating a naturally functioning stream.*
7. *Provide educational opportunities for local students.*

Did I say there were six objectives? Well, there were six primary "biological" objectives, with the seventh objective being largely socioeconomic in nature but of no less importance. It's a simple equation: OAF will rent out the farm lands and also enroll the property in an FSA/NRCS conservation easement for which it will receive annual payment. OAF will provide cash flow to EOUF, and EOUF will award scholarships to EOU students. A corollary of the equation is that the property will be available for use as an outdoor classroom for a variety of science-based learning opportunities.

Before I wander into some of the more mundane technical stuff, it's worth noting that while the Willow Creek OAF/Craig project is about watershed and habitat restoration, it's even more about human relationships. After surveys of the OAF property, it was obvious that the historic Willow Creek channel had actually crossed a neighboring property before the confluence with South Fork Willow. Childs contacted Stephen Craig, the landowner, to explore the possibility of reconnecting Willow Creek to the historic channel. The landowners (OAF and Craig) committed to voluntary restoration.

The Craig property constitutes a relatively small portion of the project, but it is a valuable complement to the main project area because of the physical location (see map, magenta-colored line) that allowed for the reconnection of the lower mile of the historic Willow Creek channel. Like the OAF property, the Craig property itself is historic, a "Century Farm" that has been in the family for well over 100 years. Craig acquired the property from family members in 1996. This effort would have been a solid project with just the OAF property included, but the cooperation of the Craig family was key to this initiative becoming a very special project.

Restoration partners, including the CTUIR, ODFW, BPA, and GRMW, gain improved habitat and water quality, while the landowners see reduced erosion, more stable riparian conditions, and financial remuneration for their commitments to a healthier environment and the recovery of Endangered Species Act-listed salmonids.

Implementation

Large wood complexes were utilized as a tool in conjunction with streambank sloping to address excessive erosion, increase complexity along pools, and initiate development of riparian vegetation along project streams. Typical structures included toe wood with a large diameter rootwad keyed into the bank and placed over the top of the wood toe, then backfilled for ballast and stability. Smaller-diameter racking material consisting of tree boles and brushy tops were then interwoven within the key member structure to provide fringe roughness, velocity redistribution, overhanging cover, and structural diversity.

A historic channel scroll along lower Willow Creek was reconstructed and activated as part of the project. Assessment of historic aerial photography indicated that the channel was abandoned in the 1960s either through direct human manipulation or indirectly as a result of irrigation ditch construction and inadvertent channel diversion. The historic channel alignment provided an opportunity to increase channel length, decrease channel gradient, reconnect the floodplain, and relocate Willow Creek from within a channelized reach to a segment with high sinuosity, a low width:depth ratio, lower velocity, and much greater complexity and diversity over time. Channel construction started in October 2012 and was completed in November 2012. This work was accomplished by Partney Construction. Approximately one mile of new channel was constructed, and the upper area of channelized reach was backfilled using spoil material from channel excavation. Two floodplain ponds were constructed on the site of the previous channelized reach, and the lower reaches were left open to provide backwater wetland and rearing habitat. Channel diversion was accomplished by constructing a compacted, earthen plug at the uppermost channel reach to divert. Additional historic channel scrolls along middle Willow Creek also were reconnected to the main channel thread by removing artificial berms and plugs to reconnect the historic floodplain, promote high-water activation, and increase hyporheic connectivity. Approximately 1,400 feet of historic channel scroll was reconnected at three locations in the middle reaches, which reconnected about 0.5 miles of floodplain, side channel, and alcove habitats.

A combination of trees and shrubs will be planted to facilitate small patches of floodplain forests. Planting density will be based on approximately 100 stems/acre. Floodplain planting units will be hand planted using locally derived, containerized plant stock. In conjunction with tree and shrub planting along stream banks and within the floodplain, approximately 78 acres of previously existing agricultural fields were planted and an additional 33 acres that are currently dominated by foxtail will be seeded and planted with small patches of trees and shrubs. Constructed channel segments and disturbed areas adjacent to wood structures were already planted with a grass seed mix of Great basin wild rye, blue-bunch wheatgrass, Idaho fescue, and tufted hair grass.

ABOVE: Willow Creek post project construction, April 2013.