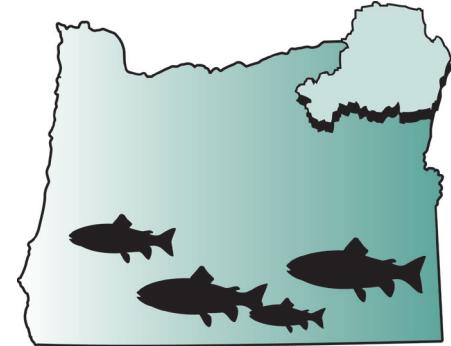


RIPPLES IN THE GRANDE RONDE



WINTER EDITION 2016

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

Joining Forces

By Aaron Bleisner
Union Soil & Water Conservation District

Partnership, Restoration, & Collaboration in Catherine Creek

Stream channels, floodplains, and riparian areas in the Catherine Creek sub-basin have been extensively altered by a number of industries and activities, including timber harvest, agriculture, livestock grazing, and transportation corridors. While important for our region's economic development, these modifications have resulted in seriously degraded living conditions for Endangered Species Act (ESA)-listed spring/summer Chinook salmon, summer steelhead, and Columbia River bull trout.

Faced with chronic flooding and bank erosion, private landowners along Catherine Creek brought their concerns to the Union Soil and Water Conservation District (SWCD) Office to discuss new solutions to these long-standing problems along the Creek. As a result, landowners and the SWCD initiated a collaborative project in 2010 to restore critical habitat for endangered salmon and steelhead in Catherine Creek as well as address erosion, irrigation issues, and flooding on adjacent private lands. The overall goal of the project was to restore natural channel functions and processes that support the spawning and rearing of ESA-listed species while protecting and maintaining the utility and economic viability of working ranches.

In 2013, data collected by multiple partner agencies over the course of many years was synthesized into a planning document called the Restoration Atlas (Atlas) for the Catherine Creek Drainage. The planning process identified

specific reaches within Catherine Creek where restoration would be the most beneficial to ESA-listed fish. As it turns out, the stretch of Catherine Creek with eroding banks and flood damage issues that landowners had discussed

Chinook spawning and rearing habitat along agricultural properties. Fish habitat in this reach has been damaged by channelization, dyking, grazing, and irrigation water withdrawals. These factors resulted in poor habitat conditions due to the loss of riparian zones and floodplain connectivity, straightened channels, and a lack of pools. High summer water temperatures, low summer stream flows, and excess sedimentation also are factors affecting ESA-listed species in the reach.

Involving quite a few years of work, miles of stream, landowners, and partners, this project



Above: Construction occurs on the lower end of the project, including large wood placement and channel regrade. The main flow of Catherine Creek has to be diverted for this component to take place. (Photo: ODFW)

with the SWCD in 2010 ranked as one of the best opportunities in the Atlas plan for high-impact restoration.

Located approximately five miles southwest of Union, this important stretch of Catherine Creek boasts three miles of spring-summer

is progressively enhancing this indispensable habitat for one of the highest-priority populations of Chinook in the Columbia Basin. The goals and objectives of this large-scale project have been sequenced in multiple phases by the project partners, which include six private landowners, the Union SWCD, the

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CATHERINE CREEK COMPLEX

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CATHERINE CREEK COMPLEX

Grande Ronde Model Watershed (GRMW), the U.S. Bureau of Reclamation (USBR), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), the Oregon Department of Fish and Wildlife (ODFW Regional and Research), and the Natural Resource Conservation Service (NRCS). The project was funded by the Bonneville Power Administration (BPA), the Oregon Watershed Enhancement Board (OWEB), and U.S. Fish and Wildlife Service (USFWS).

Progress to Date

Since spring 2010, these partners have been working to implement the four-phase project collectively referred to as the Catherine Creek Complex. Phases 1 and 2 were funded by the BPA, USFWS, and OWEB and completed in 2013 and 2014, respectively. Phase 3 is currently under construction, and Phase 4 is slated to be finished later this year.

On three different private properties, 81 large wood structures were constructed, 25 new pools were created, 9 new alcoves were constructed, 5 new side channels were built, and more than 20 acres were revegetated. The native trees and shrubs provide shade, which helps cool stream temperatures, and their roots will stabilize the streambanks. New plants will add leaf matter to the habitat that provides food sources for the fish living in the stream and contribute wood to help maintain the large wood structures and stabilize streambanks. Additionally, these projects involved irrigation upgrades to increase water efficiency, including consolidation of points of diversion and installation of 11,000 feet of pipeline to deliver water.

Thanks to funding from both OWEB and the NRCS, the new pipeline system eliminated the need for flood irrigation, allowing irrigators to maximize productivity. The improved irrigation systems will help increase the amount of water remaining in Catherine Creek during the summer months, which will aid in decreasing the stream temperature during the warmest time of the year. These water upgrades also eliminated the annual construction of pushup dams and will dramatically reduce the need for both fish screen and ditch maintenance. This project is just one example of a win-win scenario for both fish and landowners and

illustrates how ESA-listed fish species can prosperously co-exist with working ranches.

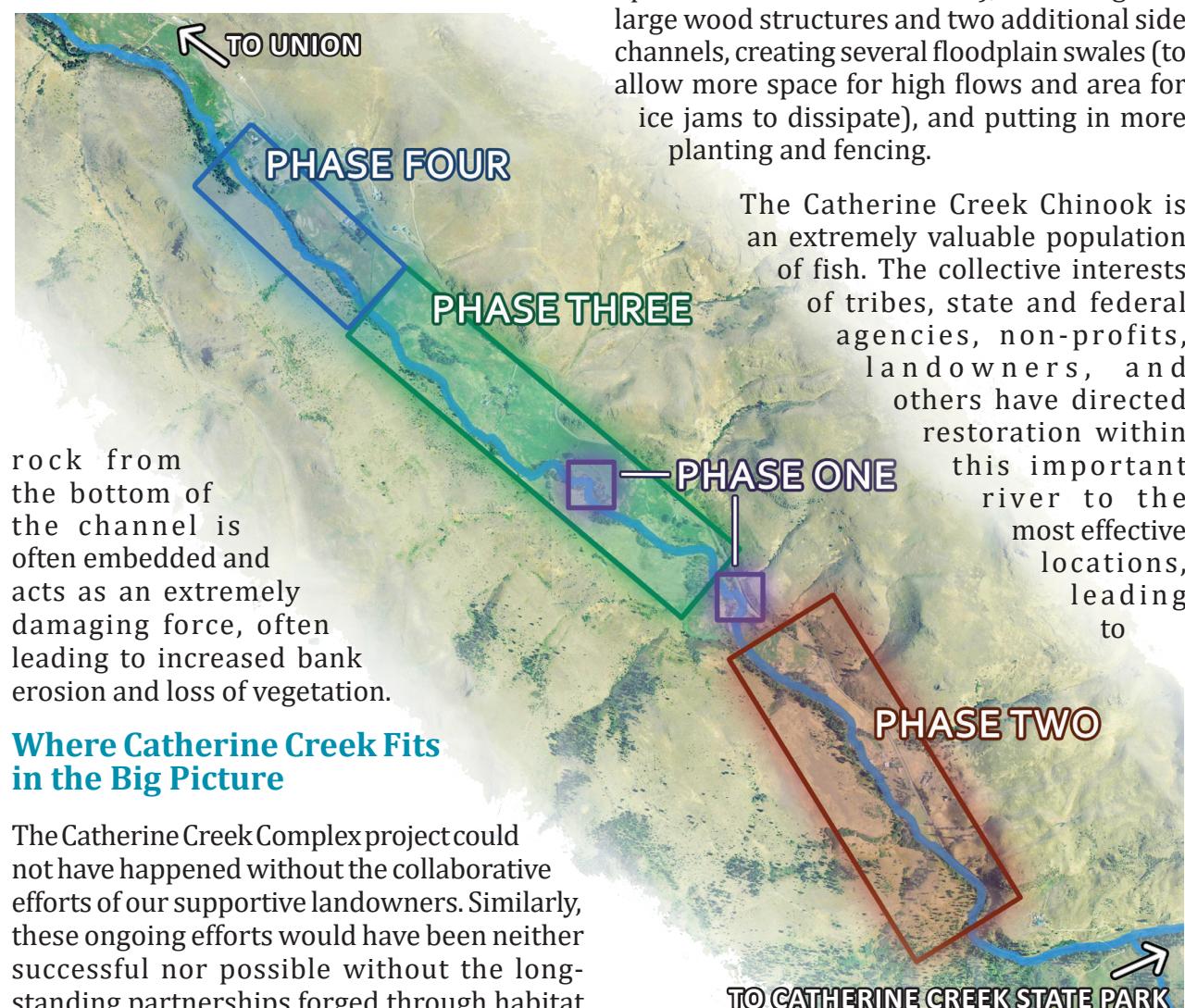
Because the majority of the stream channel targeted by the project had been over-widened, new channels were designed to narrow and deepen the flow. This design decreases the amount of solar radiation hitting the stream, which is a large contributor to increased stream temperatures. Deepening the channel also reduces the potential for ice jams freezing to the channel bottom, which can be very harmful to fish and destructive to the stream. When the ice begins to melt off and float downstream,

to transport high flows, flooding potential has been reduced. Narrowing the stream channel, increasing the overall stream depth, and establishing and maintaining a stable riparian zone will contribute to decreasing stream temperatures while providing critical stabilizing elements to the overall stream system.

The Future

The last two phases in the Complex project will involve incorporating a complete channel realignment (moving the stream channel out of the confines of the hillside and berm to the open where it can meander), installing 116 large wood structures and two additional side channels, creating several floodplain swales (to allow more space for high flows and area for ice jams to dissipate), and putting in more planting and fencing.

The Catherine Creek Chinook is an extremely valuable population of fish. The collective interests of tribes, state and federal agencies, non-profits, landowners, and others have directed restoration within this important river to the most effective locations, leading to



Where Catherine Creek Fits in the Big Picture

The Catherine Creek Complex project could not have happened without the collaborative efforts of our supportive landowners. Similarly, these ongoing efforts would have been neither successful nor possible without the long-standing partnerships forged through habitat restoration projects undertaken across the Grande Ronde Basin. The large amount of wood placed in Catherine Creek has created habitat and refuge for salmon and steelhead while stabilizing eroding banks. Increasing the number and depth of pools has both multiplied the area that returning salmonids can occupy and created excellent recreation opportunities. By expanding the stream channel's ability

Above: The project location in Catherine Creek, according to phase, approximately five miles southeast of Union.

meaningful actions that benefit fish as well as the people who call this area home. Looking forward, projects within this system will continue to add value to the restoration work that already has been completed. ■

In the Weeds

By Lacey Moore
*Grande Ronde
Model Watershed*

Finding funding to tackle invasive species in Union County



During the past year, stories bearing this title generally would be filled with details concerning the legalization of recreational marijuana. However, this article actually is about other plants that are far from ever getting the congressional green light. Noxious weeds in Union County have been an increasing problem during the past decade. Some of the most problematic weeds include Puncture Vine, which painfully gouges sandals and bike tires, Wild Carrot that knows no property boundaries and is troublesome for seed producers in the valley to control and eliminate, and Yellow Flag Iris, which spends its time blocking waterways. All three plants are examples of the annoying and costly ways in which noxious weeds impact people throughout Union County.

In 1908, the U.S. Congress dedicated 25 percent of the revenue from timber on U.S. Forest Service (USFS) land toward building and maintaining local roads, which includes weed eradication. Since the late 1980s, the federal government has greatly reduced logging on USFS land to preserve habitat for endangered species. To compensate for the reduction in timber sales, federal programs called Secure Rural Schools (SRS) and Payment in Lieu of Taxes (PILT) are offered to county governments. However, PILT and SRS fall short of the former funding levels generated by timber. In fact, the total amount offered by these two programs in 2014 was about 42 percent of the timber-generated

funds used to improve county roads in 1990. This reduction in overall funding translates into reduced services from the Public Works Department, meaning that since 2008, there has not been a weed supervisor in Union County. Additionally, the funds provided by the SRS program cannot actually be used to treat noxious weeds on private property.

In the eight years since Union County has had a full-time weed supervisor (with the authority to enforce Oregon laws pertaining to noxious weeds), invasive plants have become an increasingly difficult problem for the economics and aesthetics of the Grande Ronde Valley. In 1990, when revenue for roads sharply declined, the number of weeds listed by the Oregon State Weed Board (OSWB) increased by 40 percent in just 10 years, from 60 to 99 species. In the same timeframe,



Above: Leafy Spurge takes over native vegetation in Union County. Weeds can displace plants that animals like deer and elk depend on, ruining local hunting opportunities. (Photo: Tri-County CWMA)

county-wide weed control programs in Oregon declined by 70 percent as a result of not only timber sale reductions but also cuts to the OSWB budget.

A study commissioned by the Oregon Department of Agriculture (ODA) in 2014 found an estimated annual loss of almost \$83.5 million in personal income to the state's economy from the 25 most harmful species of noxious weeds. More than half of these weeds are present in Union County.

Noxious weeds negatively affect both urban and rural property values. According to the Washington State Noxious Weed Board, a Pacific Northwest ranch that was overrun with Leafy Spurge sold for only 10 percent of its original, pristine value. Noxious weeds also cost farmers, ranchers, and orchardists millions of dollars in control efforts and lost crop production, a cost that ultimately is passed on to the consumer in the form of higher food prices. For agriculture in the U.S., control costs and losses associated with weeds in major crops, pasture, hay and range, and animal health were estimated to be more than \$15 billion per year.

"The climate and geographic isolation of the Grande Ronde Valley is well suited for the production of certified seed of many crops," according to Darrin Walenta, an Oregon State University Extension Agronomist for Union, Baker, and Wallowa Counties. In 2013,

Walenta said that certified seed production in Union County was valued at about \$17 million. In order to be considered certified, a zero-tolerance policy is strictly enforced for the presence of invasive species in fields where this premium seed is raised. Preventing the spread of these pesky plants into a field can be a losing battle, depending on neighboring properties. Walenta pointed out that the scenario of an absentee landowner or neighbors who are unwilling to manage invasive species is "very

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IN THE WEEDS



In the Grande Ronde River Basin, habitat restoration is on a roll. During the past four years, the tribes, state and federal agencies, and conservation organizations that team up to complete projects for the benefit of anadromous fish have accomplished a lot. In fact, more than a dozen large habitat projects have been implemented in Union and Wallowa Counties. Additionally, a large-scale, data-intensive prioritization process (referred to as the Restoration Atlas) based on location, necessary actions, and biological benefit is close

to completion for both Catherine Creek and the Upper Grande Ronde River. In addition, the Grande Ronde Restoration Partnership has just secured additional dollars for habitat restoration for native fish species through the Oregon Watershed Enhancement Board's (OWEB) Focused Investment Program (FIP). The Wallowa Restoration Partnership also has received funds from OWEB to develop a strategic action plan similar to the Restoration Atlas for the Wallowa and Imnaha River sub-basins. The partners have much to be excited about, as do the communities where this money will be spent and habitat will be improved.

Some may be wondering what entities constitute the Grande Ronde and Wallowa Partnerships and what the Partnerships do. This article highlights the various groups that play such an important role in the vital but challenging habitat restoration process.

The Grande Ronde Restoration Partnership

Grande Ronde Model Watershed (GRMW)

The GRMW is the primary entity coordinating habitat restoration on both private and public lands within the Grande Ronde Basin. Fish habitat mitigation funds from the Bonneville Power Administration are allocated by the GRMW to the other restoration partners in the basin to implement fish habitat restoration projects. Previously, the GRMW staff also managed restoration projects. More recently, the program has moved away from project management in order to focus on securing additional restoration dollars and assisting partners and landowners with GIS products, database management, outreach, aerial monitoring of projects, and development of the Restoration Atlases, which

help prioritize critical fish habitat needs.

Oregon Department of Fish and Wildlife (ODFW)

ODFW is involved in the partnership through three separate but interrelated programs:

1. Fish Habitat Program

The ODFW Fish Habitat Program, located at the regional office in La Grande, implements a wide variety of habitat restoration projects. This program builds and maintains a large network of riparian fences that exclude cattle from critical reaches of salmon and

steelhead streams. The Fish Habitat program also collects a wide variety of monitoring data on their projects. This program provides expert knowledge of fish salvage operations on almost all of the restoration projects being implemented in both Union and Wallowa Counties.

2. Northeast Oregon Fish Research and Monitoring

Staff members of the ODFW Fish Research and Monitoring office located on the Eastern Oregon University campus evaluate and improve fish habitat restoration projects. The experts in this program provide data on a regular basis to restoration practitioners in order to help inform and guide development, design, and monitoring of restoration work. Recently, a new research and monitoring project has been implemented in the Grande Ronde Basin called the Columbia Habitat and Monitoring Program (CHaMP). This project will play a large role in assessing the success of restoration efforts.

3. Northeast Oregon Regional Office

The local district fish biologist based at the regional office provides expertise in technical review and development of project opportunities. The office's familiarity with regional streams, fish, and regulations is very important in the planning of high-quality restoration projects that focus on the most appropriate geographic locations and address critical factors affecting the success of native fish species.

Confederated Tribes of the Umatilla Indian Reservation Fish Habitat Program (CTUIR)

The program's mission is to provide sustainable harvest opportunities for their First Foods (in this case, salmon) that maintain continuity



Find out more about the teamwork making restoration a reality in the Grande Ronde Basin

By Jesse Steele, *Grande Ronde Model Watershed*



of the tribe's culture. The CTUIR Fish Habitat Program manages and implements restoration and passage projects funded by the GRMW and Columbia Basin Fish Accord dollars. This program also is working toward acquiring sections of land adjacent to streams that provide critical habitat for native fish. CTUIR's Fish Habitat program currently is implementing a large-scale re-channel project on Catherine Creek, located a few miles upstream of the town of Union on a parcel that was recently purchased by the CTUIR.

U.S. Forest Service (USFS) La Grande Ranger District

The USFS La Grande Ranger District's restoration program is very involved in the upper Grande Ronde River sub-basin, annually implementing several restoration projects on public land that focus on endangered, invasive, and native fish. The USFS is an especially important partner in the Grande Ronde Basin, where more than half of the land is publicly owned. Recently, the program has completed large restoration projects on the upper Grande Ronde River, Sheep Creek, and Chicken Creek.

Union Soil and Water Conservation District (SWCD)

The Union SWCD is another very active restoration partner in Union County. The Union SWCD works closely with a variety of landowners to improve both fish habitat and agricultural methods. The mission of the Union SWCD is to assist and educate interested landowners in the development, protection, and conservation of natural resources. They also are very successful in contributing cost-share to projects from a variety of sources, including OWEB, the Natural Resources Conservation Service, and others.

The Wallowa Fish Habitat Restoration Partnership

The Wallowa Fish Habitat Restoration Partnership is a cooperation between the GRMW and the Wallowa County Natural Resources Advisory Committee (NRAC) to develop a strategic action plan. The purpose of the plan is to identify, locate, and prioritize fish habitat restoration projects to maximize biological benefit in Wallowa County, specifically in the Imnaha and Wallowa River sub-basins. The NRAC side of the partnership consists of the ODFW, the Nez Perce Tribe, the USFS Wallowa Valley Ranger District, and Wallowa Resources, among others. After the strategic action plan is completed, the Wallowa partners anticipate seeking an OWEB FIP implementation grant to bolster their current habitat restoration efforts. Although this funding for a strategic action plan is new, these organizations are no strangers to partnering on restoration projects and collectively achieving restoration success. Recently, the partnership has worked to complete a large re-channel project on the Wallowa River and is in the process of improving fish passage on the Lostine River. ■

GETTING PERSPECTIVE



This photo, taken by the GRMW Unmanned Aerial System (UAS), looks on from the southern end of the Grande Ronde Valley near Union. In the forefront of this picture is a side channel/wetland restoration project where a landowner willingly provided four acres of land to allow habitat to be created, giving the river some "elbow room." Many landowners in the Grande Ronde River Basin have set aside land in this way to improve habitat, restore natural processes, improve the land, and provide flood relief.

Grande Ronde Model Watershed

UPCOMING BOARD MEETING

**Tuesday, May 24th, 2016
5:00 pm
Wallowa Community Center
204 East 2nd St.
Wallowa, OR 97885**

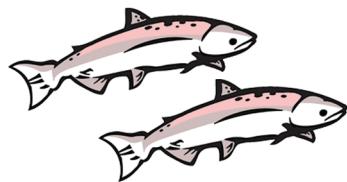
*The public is welcome to attend.
Meeting dates are subject to change,
please call (541) 663 - 0570 to confirm.
Thank you!*



Ripples in the Grande Ronde is jointly funded by Bonneville Power Administration and the Oregon Watershed Enhancement Board.



One Fish, Two Fish



By Scott Favrot
*Oregon Dept.
of Fish and Wildlife*

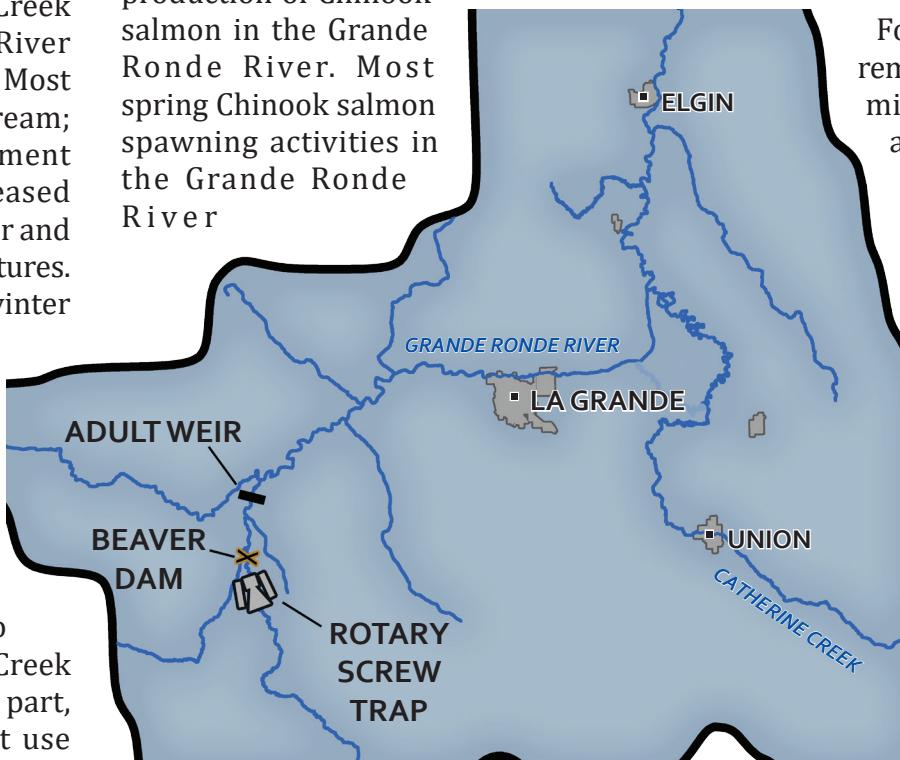
ODFW's Early Life History program studies the movement of fish in the Grande Ronde River

From 2009 to 2011, the Oregon Department of Fish and Wildlife (ODFW) conducted an extensive radiotelemetry study on Catherine Creek juvenile Chinook salmon fall migrants. The goal of the study was to identify overwintering reaches and habitat use patterns within the Grande Ronde Valley. Primarily, fall migrant parr spent the winter in portions of Catherine Creek between Union, Oregon, and the mouth of Mill Creek from October through February. Lower reaches of Catherine Creek and portions of the Grande Ronde River were occupied by fish to a lesser extent. Most fish movement was directed downstream; however, occasional upstream movement was observed. Brief periods of increased movement were observed during winter and coincided with increased water temperatures. During free-flowing conditions in the winter months, deep pools with slow currents near large woody debris and the bank were most suitable for fish. Cobble and boulders were most suitable for fish upstream of Union, while fine substrates were most suitable in the Grande Ronde Valley.

Currently, a collaborative effort to restore fish habitat within Catherine Creek is underway just upstream of Union. In part, movement patterns and microhabitat use data collected by the ODFW are being used to guide these restoration efforts, with the objective of restoring the Catherine Creek Chinook salmon population. Now, ODFW is

turning its focus toward the Grande Ronde River Chinook Salmon population that, like the Catherine Creek population, is listed as threatened under the Endangered Species Act.

In the Grande Ronde Basin and beyond, critical habitat for Chinook salmon varies greatly as fish migrate from freshwater natal streams to the Pacific Ocean. Winter rearing habitat quantity and quality may be limiting production of Chinook salmon in the Grande Ronde River. Most spring Chinook salmon spawning activities in the Grande Ronde River



Above: The study site for ODFW's fish tracking research. Catherine Creek's telemetry study has been completed, offering interesting information about how fish use different parts of the stream.

occur near and upstream of Vey Meadows. According to ODFW researchers, wild juvenile Chinook salmon exhibit two overwintering life history strategies. Early migrants move downstream from upstream rearing areas to spend the winter downstream of Vey Meadows, with a small proportion overwintering in the Grande Ronde Valley. Late migrants spend the winter in upstream rearing areas of the Grande Ronde River, a significant proportion of which flows through Wallowa-Whitman National Forest. Both early and late groups migrate seaward during the spring. Research indicates that, on average, about 20 percent of Grande Ronde River Chinook salmon juveniles use the early migrant life history strategy.

Unfortunately, survival of Grande Ronde River early migrants is typically lower than survival rates of other Chinook salmon populations in the Grande Ronde Basin, such as the Lostine and Minam River populations. Areas of the Grande Ronde River where juvenile Chinook salmon overwinter are degraded due to flow alterations, sparse stream-side vegetation that offers shade and cover, introduced non-native species, habitat degradation, and excessive amounts of silt due to erosion.

For Chinook salmon juveniles that remain in freshwater for one year before migrating to the ocean, the quantity and quality of overwinter rearing habitat influences the number and size of fish produced. Due to concerns associated with this fundamental relationship between freshwater overwintering habitat and juvenile Chinook salmon production, the ODFW Northeast Oregon Fish Research and Development team has initiated additional research on the Grande Ronde River as part of their Early Life History (ELH) research project to improve this imperiled resource. This research is a collaborative effort including the ODFW, the Bureau of Reclamation, Bonneville Power Association, the Grande Ronde Model Watershed, and the Union Soil and Water

Conservation District. The research objective is to identify and describe which stream reaches in the Grande Ronde Valley are used by juvenile Chinook salmon during the fall and winter months.

There are approximately 60 miles of river between Starkey and Elgin, Oregon, where the Grande Ronde River early migrant juvenile Chinook salmon can overwinter. The ELH project selected radiotelemetry techniques because of the high precision, flexibility, and reliability of this technology in dealing with large study areas like the Grande Ronde Valley. The first phase of this project commenced during Fall 2014 and is currently slated to conclude during Spring 2017. Knowing where Grande Ronde River juvenile Chinook salmon overwinter in the Grande Ronde Valley will assist fisheries managers in more efficiently allocating limited resources to efforts that will improve the survival of this fish population.

The first task for the researchers was to capture juvenile Chinook salmon that migrate from upstream rearing areas to overwinter in downstream reaches during Fall 2014. Researchers captured 97 wild juvenile Chinook salmon from October through November 2014 using a rotary screw trap and anesthetized them in preparation for radio tag implantation. These radio tags are approximately the size of a sunflower seed and are surgically implanted into the body cavity of each fish under sterile conditions. The only visible evidence of tagging following surgery is two small sutures that dissolve in a couple weeks and a seven-inch antenna tailing behind the fish through an exit incision. Each radio tag emits a unique signal every 15 seconds during daylight hours, allowing fisheries researchers to track individual movements of tagged fish.

Next, the researchers conducted manual tracking using a mobile receiver to locate tagged fish and then obtained geographic



Above: ODFW staff use mobile receivers to track fish locations of Chinook fitted with radio tags. **Below:** The Upper Grande Ronde Rotary Screw Trap helps researchers estimate timing and abundance of outmigration for juvenile fish. (Photos: ODFW)



coordinates using a hand-held GPS device. The researchers located each tagged fish weekly throughout the fall and winter. The upper sections of the Grande Ronde River are shallow and were tracked by foot; however, the downstream sections are deeper and were tracked by boat. When snow and ice covered the creek, researchers tracked the fish manually on foot with the assistance of crampons. Stream reach occupancy will guide and focus implementation of specific restoration techniques to achieve the overall goal of improving the status of Grande Ronde River Chinook salmon.

In addition to weekly location of tagged

fish, the researchers monitored environmental conditions by collecting continuous hourly water temperature data throughout the study area. The last task for this project is to submit a final report to the Bureau of Reclamation summarizing the research team's findings on which stream reaches are used by juvenile Chinook salmon in the Grande Ronde Valley during winter.

Preliminary results from 2014 and 2015 have indicated that the majority of tagged juveniles are overwintering upstream of Starkey, Oregon; however, a small proportion are migrating into the Grande Ronde Valley and beyond. In addition, a large proportion of the tagged juveniles are overwintering within habitat characterized by higher depths and slow velocities, especially when associated with beaver impoundments.

DFW and collaborators are optimistic that this research effort will yield results that foster effective habitat restoration projects to improve survival of Catherine Creek and Upper Grande Ronde early migrant juvenile Chinook salmon during their seaward migration through the Grande Ronde Valley. Returning adult Chinook salmon are culturally, economically, recreationally, aesthetically, and ecologically important to the Grande Ronde Valley. Numerous user groups rely upon this resource, from American Indian tribes and local businesses to fishermen and wildlife enthusiasts. In addition, returning adult Chinook salmon are a keystone species central to the operations of a healthy ecosystem. Other native species that cohabit drainages supporting returning adult Chinook salmon benefit from carcass nutrients originating in the Pacific Ocean, such as birds of prey, scavengers, stream-side vegetation, herbivores, aquatic life, and predators. Increasing survival

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ONE FISH, TWO FISH

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unfortunate because, in reality, it takes a unified effort over the long-term to effectively manage noxious weed infestations."

Weeds also negatively affect timber; in fact, it was estimated by the ODA in 2000 that Scotch Broom alone cost Oregon \$47 million in reduced forestry production on an annual basis.

Invasive plants are more than a problem for homeowners and farmers. Weeds also can spoil game seasons, which many hunters look forward to. Rangeland weeds outcompete native plants on which ungulates depend. For example, Spotted Knapweed, a weed present in Union County, can reduce the forage quality for elk and deer by up to 90 percent. The lack of forage forces game animals to search elsewhere for food, negatively affecting both hunting and wildlife viewing opportunities. ■

Union County is not alone in the fight against invasive species. However, neighboring counties have taken action to control the problem in order to protect natural resources and property values. Both Wallowa and Baker Counties have passed tax levies dedicated to the control of noxious weeds that are tailored to regional priorities.

Wallowa County's Vegetation Department has been funded via local option tax levy for the past 14 years. By agreeing to pay \$0.19 per \$1,000 of assessed property value, Wallowa County residents have been able to hire a full-time vegetation manager, leveraged levy dollars to acquire an additional \$109,000 in grant funding, and provided more than \$20,000 in cost-share to county residents for weed control, all within just the first five years of the levy's passage.

ODA's 2014 study on the economic impacts of noxious weeds in Oregon suggests that money spent on weed control and prevention is a very wise investment. In fact, biological control of Tansy Ragwort has a \$13 return for every \$1 invested, and prevention programs return \$34 for every dollar spent. According to Oregon State University Extension, Tansy Ragwort, a weed present in more than 2,000 acres in Union County, is lethal to both horses and cattle. ■

The issue of noxious weed control in Union County was referred to the voters by County Commissioners at their February 3, 2016, meeting. The proposal includes a \$0.12 per \$1,000 of assessed value local option levy, costing a resident with a \$100,000 home only \$12 each year. For residents who currently invest time and money in weed control, this funding strategy may amount to significant savings. For more information about the levy, contact Dan Sharratt, a retired ODA Regional Weed Specialist with more than 30 years of experience: sharrattdan@yahoo.com. For more information about controlling weeds in Union County, the public is welcome to attend monthly weed board meetings; contact board president Alan Guttridge to confirm meeting dates at alang.forestry@gmail.com. ■

...continued from page 7, ONE FISH, TWO FISH

of juvenile Chinook salmon populations in the Grande Ronde Valley could potentially benefit many different user groups and improve ecosystem health.

This radiotelemetry project is one of many research efforts of the ODFW's ELH project. The overall goal of the project is to investigate the critical habitat, abundance, migration patterns, survival, and alternate life history strategies exhibited by spring Chinook salmon and summer steelhead juveniles from distinct populations in the Grande Ronde River and Imnaha River subbasins. The ELH project obtains and provides information on abundance of juvenile Chinook salmon and steelhead parr and estimates of survival for several life stages. Field techniques employed by ELH project researchers include snorkeling, seining, operating rotary screw traps to capture migrating juvenile fish, marking juvenile salmon and steelhead with PIT tags to estimate survival, and radio-tagging to determine winter habitat use. Research conducted by the ELH project provides a means for long-term monitoring of wild juvenile salmonid production in the Grande Ronde and Imnaha River sub-basins that is essential for assessing the success of habitat restoration and fish population enhancement efforts. ■

Grande Ronde Model Watershed

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