

RIPPLES IN THE GRANDE RONDE



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

More investments on the way for **IRRIGATION IMPROVEMENTS** in the Wallowa Basin

by NRCS Oregon



systems, improve public safety, and maximize water efficiencies.

“The partnerships with local landowners and partners in Wallowa County are critical to success on the ground,” said Jay Gibbs, NRCS basin team leader for the John Day/Umatilla and Snake River basins. “This project highlights that good planning and good partnerships yield results. As a partnership, we utilized a strategic approach to conservation to guide our goals for the basin and determined where we collectively needed to focus our work,” Gibbs added. “Local partners helped to accelerate funding for this important project by being nimble and adaptable.”

*Continued on page 2, **IRRIGATION***

In October, the Oregon Watershed Enhancement Board (OWEB) announced \$325,666 in funding that will help improve water quality in the Wallowa River to benefit native salmon and steelhead habitat in the Prairie Creek area of Wallowa County. With multiple conservation agencies and partners engaged in conservation in the Wallowa River basin during the past several years, this recent OWEB funding is a much-welcomed boost to accelerate implementation of conservation practices on the ground.

The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) has been involved in the North Prairie Creek project for several years, investing technical and financial assistance dollars through multiple Farm Bill programs. Additional partners include the Wallowa Soil and Water Conservation District, the Wallowa Lake Irrigation District, the Farmers Conservation Alliance (FCA), and the Oregon Department of Environmental Quality. The overall goal is to convert open-ditch canals to efficient, closed-pipe systems that are gravity-fed. The project will improve water quality for fish, reduce energy costs and labor associated with operating the irrigation



Placing two smaller pipes in the trench side-by-side was found to be more cost-effective than purchasing one larger pipe. This pipeline is estimated to save up to 30 cubic feet of water per second (courtesy of GRMW).



with additional funding and in-kind services provided by project partners. This project proposes to pipe private ditches, install water control structures/fish screens on newly piped ditches, and install up to 10 new sprinkler systems to increase on-farm conveyance and application efficiency. These actions will improve water conveyance and application efficiency, reduce fish entrainment risk, decrease return flows into Prairie Creek and the Wallowa River, and decrease sediment, nutrient, and bacteria inputs into Prairie Creek and the Wallowa River. The FCA and its partners seek to benefit threatened or endangered populations of spring Chinook salmon, summer steelhead trout, and bull trout. Conservation work will occur in three sub-watersheds that lie east of Joseph and Enterprise, Oregon. They encompass Prairie Creek and the majority of the 20,000 acres irrigated from Prairie Creek and Wallowa Lake.

Sections of pipe at a staging area waiting to be installed. These sections will help complete phase one of the pipeline, which will stretch approximately five miles. (courtesy of GRMW).

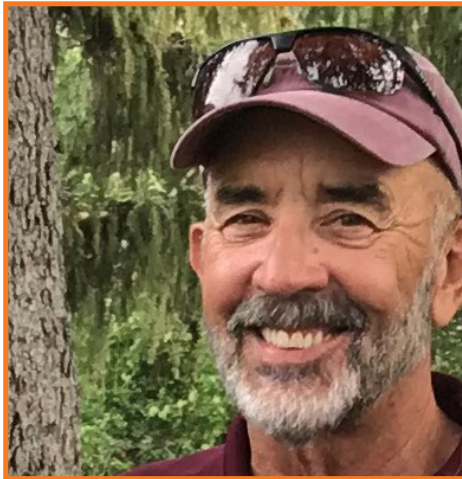
Recent NRCS funding for the Prairie Creek project comes from the Regional Conservation Partnership Program (RCP), a new program in the 2014 Farm Bill. NRCS committed \$1.7 million to the project,

In addition to RCP, NRCS invested \$2 million in financial assistance through its drought initiative to help farmers and ranchers mitigate the impacts of drought on their farms. The conservation practices installed through the drought initiative complement the work being done through other programs to address water conservation in the Prairie Creek area. ■



A section of trench that is prepared and ready for pipe installation. The Farmers Ditch, which the new pipeline will replace, is visible on the hillside in the distance. The ditch will be kept intact to serve as a catchment area and wildlife habitat (courtesy of GRMW).

The Exit Door >>>



by Jeff Oveson, *GRMW Executive Director*

I've given a lot of thought to how I might craft this last submission to *Ripples*. I never reached a conclusion, yet here I am writing it, knowing where I want to go but not knowing how to get there. I would like to say so many things to the people of the Grande Ronde and Imnaha River sub-basins (essentially Wallowa and Union counties and heretofore referred to as the "basin"), but who's to say I'm more qualified to editorialize now than I was when I started this job almost 19 years ago.

I will say that I hope you all appreciate this incredible corner of the state for what it provides us on so many levels and what it promises for the future. I will also say that I hope you are honest enough with yourself to recognize that it is far from what it could be. This land can be a land that sustains a vibrant population of people alongside healthy streams within healthy functioning watersheds, but not without your participation.

As resource extraction industries have taken a public flogging over the last couple of decades (some of it justified), it is becoming apparent that those same industries, with new technology and a better understanding of the long-term effects of their actions, can take the lead toward a more balanced and sustainable environment composed of myriad ecosystems. Two basic needs, food and shelter, have been the drivers of human

actions since before we began walking upright. Early on, food and shelter were acquired on a subsistence basis, before they became marketable goods. Food and shelter will continue to drive the decisions affecting the future of our region, but the procurement of both must become sustainable, even regenerative, practices. And they will. In terms of efficiency and sustainability, irrigated agriculture is probably ahead of timber management and grazing, but all three are much more efficient and sustainable than they were even a couple of decades ago. If a single farmer owned an acreage the size of the City of La Grande and wasted as much water growing crops as city dwellers waste growing lawns, then there would be public outrage. I wouldn't deny anyone a well-kept lawn, but I hope we all learn to avoid watering driveways, sidewalks, and streets. The restoration of a healthy ecology must come as a function of, not at the cost of, a healthy economy, but that evolution will require the participation of country folks and city dwellers alike.

Juggling the inputs of many perspectives, this has been an interesting career. In my time here, I have experienced some unfounded bias, not that I didn't anticipate some of it. I was once described as a "mediocre socialist." I received an invective- and expletive-laden letter accusing me of being in the pocket of the livestock industry. Once, when a "collaborative" group of us were working on a mission statement, I suggested the phrase "environmental, economic, and social" as part of the description, only to have one person insist that "environmental" not be used because of the connotation. I've heard a guy complain about being treated with disrespect and, minutes later, condemn the entire population of long-time Wallowa County residents. I recall these incidents because they stand out, the exception rather than the rule. My father used to tell me that almost all the people I would meet in my life would be good people, but that it wasn't up to them to prove it. It was up to me to find it within them. I have

failed miserably with a few, but discovered incredible personas in many more. Dad was right. I've come to know a lot of really good people.

We will never all agree, but maybe someday we will all understand each other. I'm sporadically discouraged by the slow pace of progress and the political subtitles to every story, but I see the positive side more often than not. I retain an abundance of faith in the people of this basin, and I know that I am lucky to have worked with so many of you.

When I came on as the fourth Executive Director in January 2000, Grande Ronde Model Watershed was an eight-year-old social experiment. The program is well beyond that now, mature with more focus on established priorities, receptive to opinions and help from outside while remaining true to the values of the people. We couldn't have gotten here without the leadership of an effective Board of Directors. In a position like mine, one could only hope for a Board of Directors that is committed to the mission of the organization, and I have enjoyed that dedication. They have led with patient latitude while expecting results. Diverse in background and opinion but blessed with a collective common sense and vision, they share their perspectives without failing to hear what others say. The Directors understand that environmental, economic, and social values are inseparable, and I will always appreciate that.

I am beginning to realize how much I will miss the people I work with every day: Mary Estes, Coby Menton, Jesse Steele, Connor Stone, Alex Towne, and Kayla Morinaga. Individually and as a team, they are committed to excellence and integrity, dedicated to the people and resources of our basin. I'm a lucky guy to have had the chance to know and work with them. I know they've always had my back, and I hope they know I've had theirs. If I've done anything right, it's that I've hired great people and stayed out of their way. So, to all who have served on our Board, all who have worked on our staff, all of you who've been wonderful partners, and all of you landowners who have trusted us to do the right thing, I say, "Thank you very much." ■

LOOKING BELOW THE SURFACE

Impacts of Groundwater and Subsurface Flow in the Upper Grande Ronde River Watershed

by Noel March, *BS Environmental Geoscience, University of Oregon*

Stand at the banks of any river, and you'll see water flowing by in a channel. Of course, there is more going on in the river than meets the eye, especially right under your feet. In most rivers, much of the volume of water actually flows underground. It follows a similar (if much slower) path as the river you can see on the surface, seeping downhill through the coarse gravels and sediments of the streambed. In natural streams, this subsurface (or "hyporheic") flow is in a constant state of exchange with the water on the surface. It drains out of the channel like water through a strainer in areas of downwelling, only to resurface at some point downstream where higher pressure forces it back out of the sediments. Along the way, it mixes with groundwater from surrounding aquifers created by rain or snow days, months, or even years before. In some places, cracks in the bedrock funnel this groundwater up to the surface, where it forms cold springs. In others, it joins the stream system as a constant, slow seep.

So, why should we care about all of this underground activity? When it comes to river restoration, most of the attention understandably is given to what happens on the surface. After all, that's where the fish live. But what goes on below the ground affects life above it, and upwelling water makes its mark topside when it comes to stream temperatures. During the heat of the summer, water flowing underground often is much cooler than water on the surface, so upwelling can significantly cool down parts of a stream. In places like the Upper Grande Ronde River watershed where stream temperatures regularly reach the upper limits that native fish can tolerate, sources of colder water can be a refuge for fish when streams are running low and warm. Factors like shading and cold tributaries have larger-scale effects on water temperatures,

but past research like the work of Ebersole et al. (2003) has shown that even small pockets of cool water frequently are used by fish in the Upper Grande Ronde River watershed.

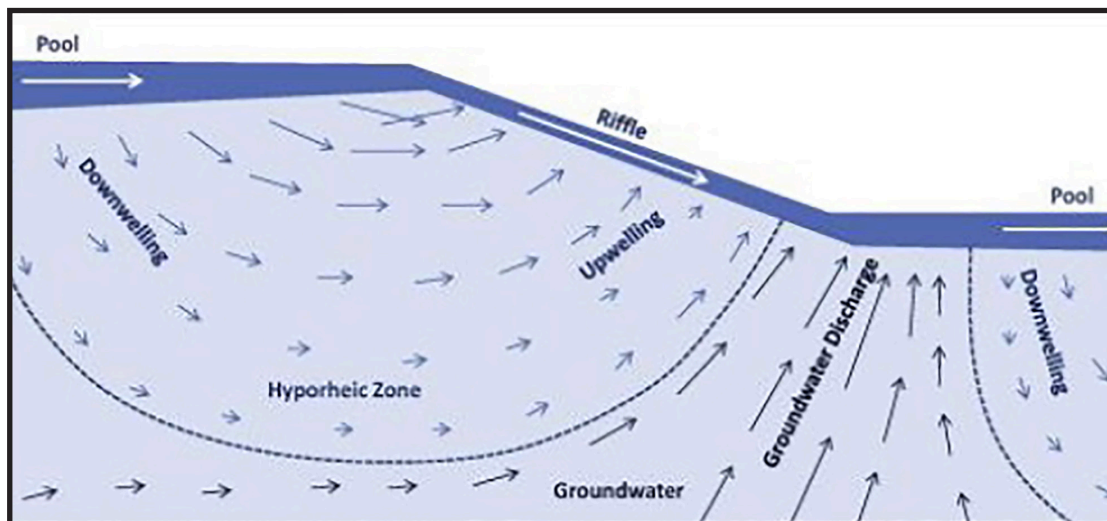
For obvious reasons, the world of subsurface flow is poorly understood, despite its importance. You can't see it, and its effects can be tough to measure in the field. For my undergraduate thesis at the University of Oregon with the help of the Columbia River Inter-Tribal Fish Commission, I studied the impacts of groundwater and hyporheic flow on stream temperatures in the Upper Grande Ronde River watershed. I wanted to find out whether there was a way to quantify their respective impacts on cooling, which would help us better understand how cold-water refuges form.

To do this, I surveyed four reaches spaced throughout the Upper Grande Ronde River and Five Points Creek totaling nearly 5.5 miles. The first task was to figure out where any cold-water anomalies might be occurring. Using a temperature probe, I searched the channel for water that was more than 2°C colder than the surrounding stream, where the colder temperature couldn't be explained by shading or cold tributaries. I noted all cold-water locations as well as the types of channel features with which they were associated.

Considering temperature alone, it is impossible to tell whether cold water is groundwater from the aquifer or stream water that is resurfacing after percolating underground through the sediments. Luckily, water has different chemical properties depending on where it comes from, which can be used as tracers to distinguish between the two types of water sources. For instance, groundwater has more time to dissolve minerals from the surrounding bedrock than water in the stream. As more ions are dissolved into water, its ability to conduct electricity increases (little-known fact: pure water doesn't conduct electricity at all!). In contrast,



Chinook salmon pair in the Upper Grande Ronde River (courtesy of Noel March).



Model showing hyporheic exchange and groundwater discharge (courtesy of Noel March).

we expect hyporheic flow to have much lower conductivity, roughly the same as the water in the channel. With the help of a conductivity meter, I could easily tell which parts of the stream were being influenced by groundwater discharge and where temperature anomalies couldn't be explained by cold springs.

More work was needed to assess how much cooling each source was responsible for. By using average conductivity values for area groundwater, assuming an average ground temperature (the mean annual air temperature), and comparing these values to the conductivity and temperature of the surrounding stream, I was able to estimate the relative contributions of groundwater and hyporheic flow to cooling.

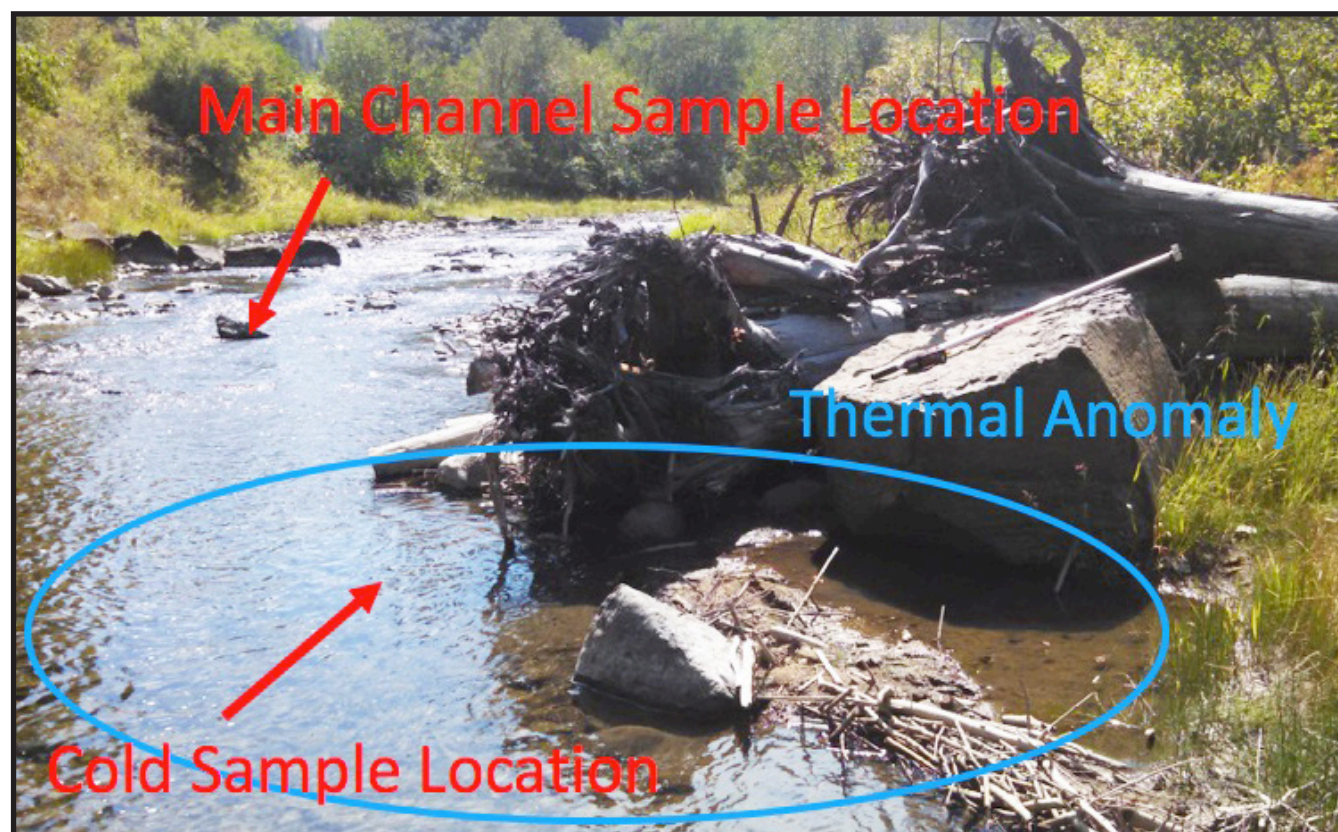
This method produced some interesting findings. In the four study reaches, I counted a total of 26 cold-water patches, with temperatures between 2°C and 7°C cooler than the surrounding stream. Of these, five sites were cooled mostly by groundwater, indicating cold springs. Ten sites were cooled with mostly hyporheic flow, indicating strong upwelling, and 11 sites were cooled by a combination of the two, meaning groundwater is mixing with hyporheic flow underground.

Mapping revealed that cold-water patches tend to be clustered together in the study area. Most were found in the form of "stratified" pools (coldest temperatures near the bottom), pocket pools on the periphery of the channel, and partially dry side-channels where water was flowing out of the streambed. Clusters of hyporheic-cooled sites probably mean there is a lot of hyporheic


exchange going on in those areas. Past research has shown that hyporheic exchange is caused by complex channel topography. Simplified channels with few pools and meanders tend to have little exchange, which certainly appeared to be the case in the Upper Grande Ronde River watershed. This finding has implications for restoration, suggesting that future projects actually could create more thermal "refugia" for fish by increasing the amount of pools, side-channels, and meanders. In contrast, areas with groundwater-dominated sites are likely associated with geologic features like faults and lava flow boundaries. Such places may be good candidate sites for habitat improvements that help fish take advantage of the reliably cold water.

The major common denominator across all of these sites was slow currents, with no cold-water patches found in fast-moving sections. Most upwelling is so slow that without a protected pocket, it is quickly overwhelmed by warmer stream water before it can accumulate enough to be used by fish. There is a good chance that cold upwelling happens in a lot of places, but measurable temperature changes only occur when channel conditions align perfectly. This is further evidence that restoration projects designed to break up the current in the channel also might create colder pockets where water already is upwelling. In the future, it would be interesting to test

*Continued on page 8, **GROUNDWATER***



Example of a typical cold-water patch in the Upper Grande Ronde River (courtesy of Noel March).



A FINAL RIPPLE ACROSS THE GRANDE RONDE RIVER BASIN

by Jeff Oveson, *GRMW Executive Director*

amount of space. “And other duties as assigned...” is a catch-all phrase that connected three wonderful people at GRMW with *Ripples*. Leigh (Baum) Collins and Lacey Moore, two natives of Union County and one-time GRMW employees, served in the publisher role, pulling all the strings, making all the calls, and asking partners to contribute articles then reminding them of looming deadlines to make sure we had a high-quality product to take to print. Alex (Borgerding) Towne, a native of Wallowa County, has selflessly taken on those tasks over the past couple of years. It is a thankless job, one that each of them did magnificently, and I am forever grateful.

Sadly, unless and until we find an alternative way to fund publication of *Ripples in the Grande Ronde*, this will be our last issue. The Bonneville Power Administration has generously provided funding for *Ripples* throughout the course of its 16-year run, but policy changes amidst budget challenges are bringing that support to an end. The Oregon Watershed Enhancement Board also supplemented the cost of publication for a short period of time. To both organizations, all of us here at the Grande Ronde Model Watershed (GRMW) say “thank you.”

Once those tasks were accomplished, issue production was coordinated with staff at the *La Grande Observer*, where the electronic version was turned into printed material for insertion into the thrice-weekly publication. A little more coordination was required as the *Observer* handed off printed copies to the *Wallowa County Chieftain* for insertion in their publications. Thanks to both papers for working with us so patiently over the years.

Creating public awareness is always a big challenge for non-profit organizations, and it was during discussions about how to accomplish the task that we landed on the idea of a newsletter. Newsletters are nothing new. Everyone produces them, but with mixed success in terms of creating public awareness. The content has to contain technical information if it is to inform readers, but most casual readers don't really want to read and digest a lot of technical material, so composing an informational newsletter that also entertains readers is a balancing act. An axiom of writing is that people read technical writing because they have to and read narrative writing because they want to, so we knew we needed content offering meaningful information that people actually would enjoy reading. We didn't always successfully find the right balance, but we got enough positive feedback, both locally and region-wide, that I'm confident we were pretty close most of the time. One thing I came to learn is that most good technical writers are not great narrative writers, while the same could be said of most good narrative writers and technical writing. There are a select few who can do both well, I assume due to a blend of talent and education.

If you've been a regular reader of *Ripples*, then you know that many of the articles are contributed by our partners. Writing these articles involves extra work that they don't get paid for, but it provides an opportunity to share their vocations beyond their normal work-related circle of acquaintances. To most of them, agreeing to write an article probably seemed like a good idea right up until they were facing a deadline. I can't take the space to name all of these authors here, but we are very grateful for their willingness to contribute.

Two very special people, Beth Stewart and Margaret McGladrey, have served as our editors for most of the life of *Ripples*. Their contributions of catchy headlines, precise editing and layout, and timely suggestions were noteworthy, and while we could have done it without them, we would not have done it nearly as well. Plaudits to both of you.

Several current and former GRMW staff members have taken on the role of publisher, which involved scheduling articles for different issues, requesting contributions of content from various partners, and working with our editors to pull together a complete issue on time and in the right

Continued on page 8, RIPPLES

A Special Thank You from Jeff:

This issue of *Ripples* is largely the result of generous people donating to the cause through a Facebook fundraiser. Many thanks to all of you, in no particular order:

Rod McCrae, Jean MacTarnahan, Ken Bierly, Dick Fosbury, Gretchen Svendsen, Janet Scoubes, Evelyn Spikes, Dena Marshall, Bruce Womack. It's interesting for me to look back at the ways all of you have impacted my life, all for the better.

Show Your Support for the GRANDE RONDE MODEL WATERSHED

We have partnered with local artist Ashley Barnes of Pinedrops to create t-shirts as a way to raise awareness (and hopefully a little money) for our organization. If sales go well, then we will fund more issues of *Ripples* ourselves!

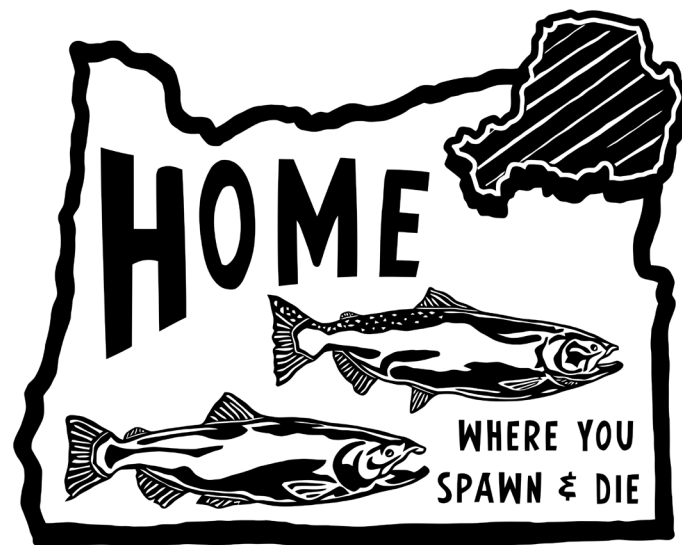
Buy a shirt to show your support for Grande Ronde Model Watershed, and represent our little corner of the world!

**THE TWO LOGOS BELOW WILL BE AVAILABLE SOON ON T-SHIRTS FOR PURCHASE!
CHECK OUT THE PRE-ORDER FORM ON THE GRMW FACEBOOK PAGE, OR STOP BY THE OFFICE!**

1114 J AVENUE - LA GRANDE, OR - 97850



grande ronde model watershed



grande ronde model watershed

T-Shirts not really your thing?

If these shirts aren't your style but you would like to show your support, then please consider making a donation on our Facebook page.

Don't forget to like and follow us, too!

... continued from page 5, **GROUNDWATER**

this theory by conducting before-and-after temperature surveys of restored areas.

This project opened my eyes to the importance of groundwater and subsurface flow in the Upper Grande Ronde River watershed and provided some insight into how these flows interact with streams. It also produced a relatively cost-effective method of estimating the impact of groundwater and subsurface flow on temperature, which more in-depth studies could use in the future. Yet the world beneath our feet remains mysterious, and more research is needed to help us understand how best to incorporate groundwater and subsurface flow into stream restoration efforts.

... continued from page 7, **RIPPLES**

Ripples often featured restoration work that was done on private land, and our requests of landowners that we or one of our partners write an article about the work and about them were met with a wide variety of responses. Some were glad to share the experience, while others were more reticent due to their modesty about themselves or their work being the subject of an article. To all the landowners, we offer our

sincere thanks. To those of you who took extra time to answer questions and give information, you have our heartfelt gratitude.

From time to time, we published articles about our GRMW Board of Directors members. I typically received the assignment of writing these articles for two reasons: first, I enjoyed the chance to learn more about these people and their lives and families, and second, although I might not be a good author of human interest stories, I am a terrible technical writer. Double thanks are due here because without the support of our Board, we wouldn't have had *Ripples* in the first place, and without their cooperation, I wouldn't have had much to write about.

I'm sad to see *Ripples* go away for many reasons. I hope that it comes as a disappointment to you, too, and that you will watch our website and our Facebook page as we strive to develop another funding source to revive it.

So many people have been involved, and I want each of them to feel my appreciation. But without you, our readers, there really would have been no need for *Ripples* to exist. Thanks to you for the calls and letters and for the casual "I was reading the latest *Ripples* the other day and..." conversation-starters that kept us and *Ripples* going. I hope you enjoyed the ride. ■

Grande Ronde Model Watershed UPCOMING BOARD MEETINGS

**Tuesday, February 26th, 2019
5:00 p.m.**

*Elgin Community Center
260 N 10th St.
Elgin OR 97827*

The public is welcome to attend.

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

Grande Ronde Model Watershed

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