# BEAVER WETLANDS, WET MEADOWS, AND PONDS

## Creating Wildfire Safety Zones and the Possibility of Survival

by Suzanne Fouty, Ph.D., *Hydrologist*

WILDFIRE – a large, destructive fire that spreads quickly over woodland or brush. It is unpredictable, able to turn on a dime and race in the other direction if the winds and terrain and conditions are right. What does it mean to be wildlife, livestock, or people faced with such an unpredictable natural element – one that burns and renews? One that leaves charred remnants of homes, memories, animals, and lives but also triggers new growth and future possibilities?

Even before the fires began this September, wildfire was on people's minds (Figure 1). While they have always been part of the landscape, wildfires now occur in a changing climate and on a changed landscape. Where tall ponderosa pines once stood, capable of withstanding most wildfires, they now burn, the forests in parts of the state having filled in with ladder fuels allowing fire to reach high into their canopies. Where native grasses once flourished, there is now cheatgrass and other invasive species that burn hot, carry fire, and return before native plants. Where lush and diverse wet meadows and wetlands once flourished, filled with migratory birds and mammals, there are now encroaching conifers, weeds, and annuals, responding to the lowered water table, or fields growing hay or produce, or homes. Once stream systems seasonally flooded their adjacent valleys, recharging the water table. Now, water rushes past these areas in the spring because streams are confined to over-wide and incised channels. The landscapes along their way are left parched and the groundwater recharge process that sustained the stream systems and banked water for the drought years is all but eliminated.


**Figure 1: May 29, 2020, front page of the *Capital Press*.**

DROUGHT – a prolonged period of abnormally low rainfall, leading to a shortage of water. In Oregon, drought is frequent and tends to cover broad areas (Figure 2). Like wildfire, it is unpredictable in terms of its location and severity each year. However, unlike wildfire, drought can persist for months, returning sometimes for years in a row (Figure 3). When it comes, especially if there are multiple years of drought, streams and reservoirs run low and the grasses crunch underfoot, ready to burst into flames. To wildfire and drought, there is no urban-rural divide or east side-west side divide; there is only the changed landscape, the weather, and the interaction of the two.

Yet, once upon a time, stream corridors were filled with beavers creating and maintaining

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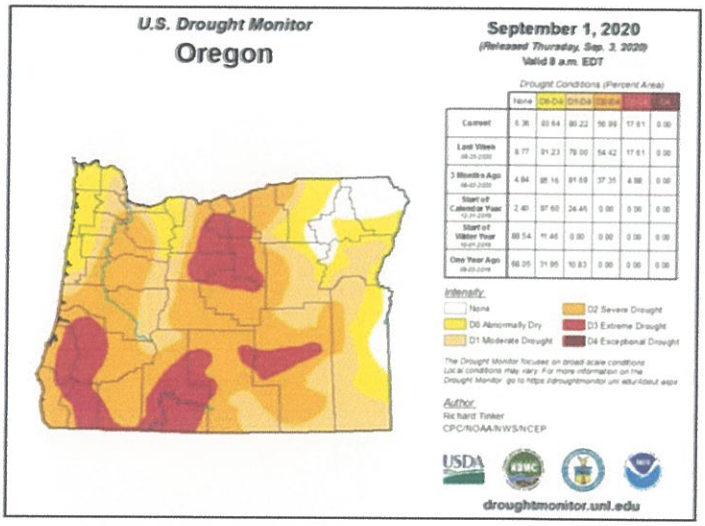


**Figure 2: September 1, 2020, drought map showing most of the state in moderate to severe drought.**

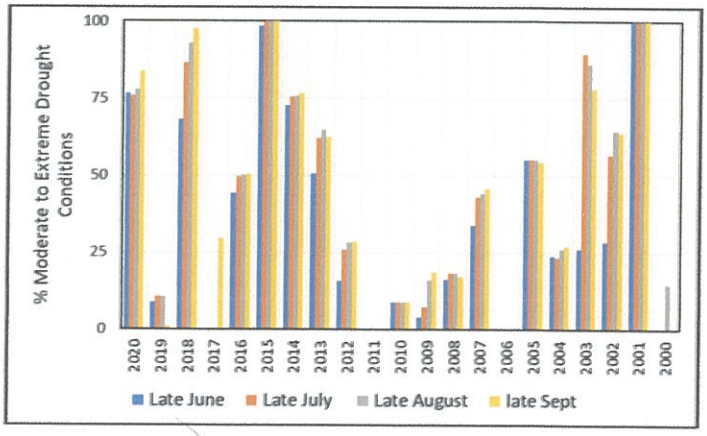


**Figure 3: Percentage of the state in moderate to extreme drought conditions from late June to late September over the past 20 years. Data from the U.S. Drought Maps.**

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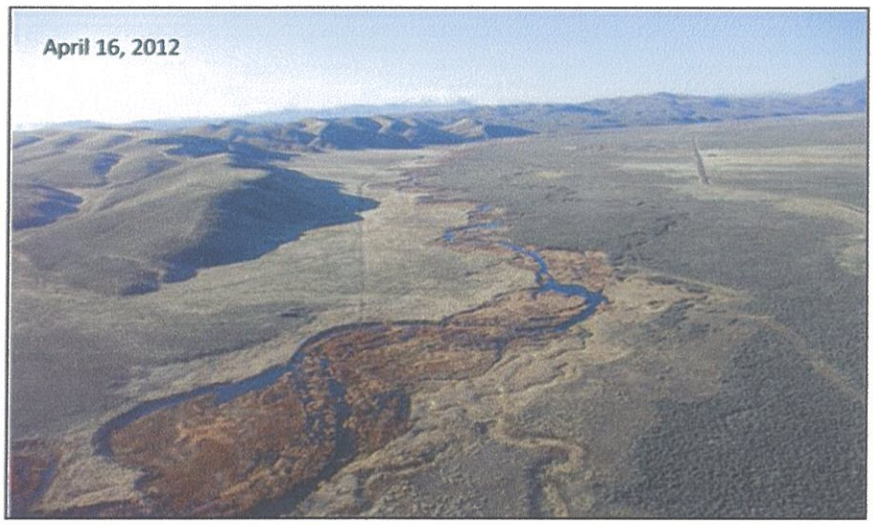


**Figure 4: Maggie Creek, Elko County, Nevada. This area is in moderate to severe drought yet has 28 miles of water-abundant landscape due to abundant beaver dams and continued good livestock management. Note the lush vegetation in wetlands vs. dry uplands.** (Photo: Carol Evans)

complex, water-rich habitats that were highly resistant to disturbance (Figure 4). These wetlands, wet meadows, ponds, and riparian areas served as wildfire safety zones, fire breaks, and water banks for the dry years. They were places of refuge during and after a wildfire, providing habitat and forage as winter approached, and sustenance the following year as the uplands began their slower recovery. But these complex, water-rich habitats are mostly gone as a result of human land uses. No longer do wildfires have to leap across lush, green zones or sputter out. Now, they frequently burn across a narrow riparian zone to the water's edge, taking all safety and refuge. While narrow riparian zones will recover the next year, during the in-between time, there is no food or habitat to wait out the winter months. Instead, there is often only exposed soil, charred remains, declining water quality, and quiet. This is our current reality and will be our future one unless we make different choices. And, it turns out, one of those choices is whether we are willing to share space with beavers and allow them to once again create water-rich habitats that restore water back onto and into our dry landscapes in advance of, and in preparation for, a wildfire or drought (Figures 5, 6, and 7).

The unpredictability of wildfire and drought means that these wetlands, wet meadows, riparian zones, and ponds must be abundant, large, and widely distributed across the state. They must occur on federally managed public lands, on state and county public lands, and on willing private lands if they are to provide the refuge and habitat needed when a wildfire occurs or drought settles across an area. The beauty of these water-rich habitats, created and maintained by beavers, is that they provide services beyond just wildfire safety zones and water banks. They also quietly capture and store carbon, improve water quality and fish and wildlife habitat, lower stream temperatures, provide for migratory birds, and sub-irrigate fields and improve yields. But it is during wildfire and drought that their value becomes most visible.

Every wildlands firefighter knows to identify the safety zone where they can run to, deploy their shelters, and have the chance of survival. Stewardship of our wild and human communities and of our firefighters requires that we do no less than create as many and as large and widely distributed safety zones as possible because it's not just about surviving the fire, but also its aftermath (Figure 8). Success in this endeavor requires we partner with beavers because we don't have the time, the skill, or the dollars to do it ourselves. They, in contrast, are master builders of wetlands,

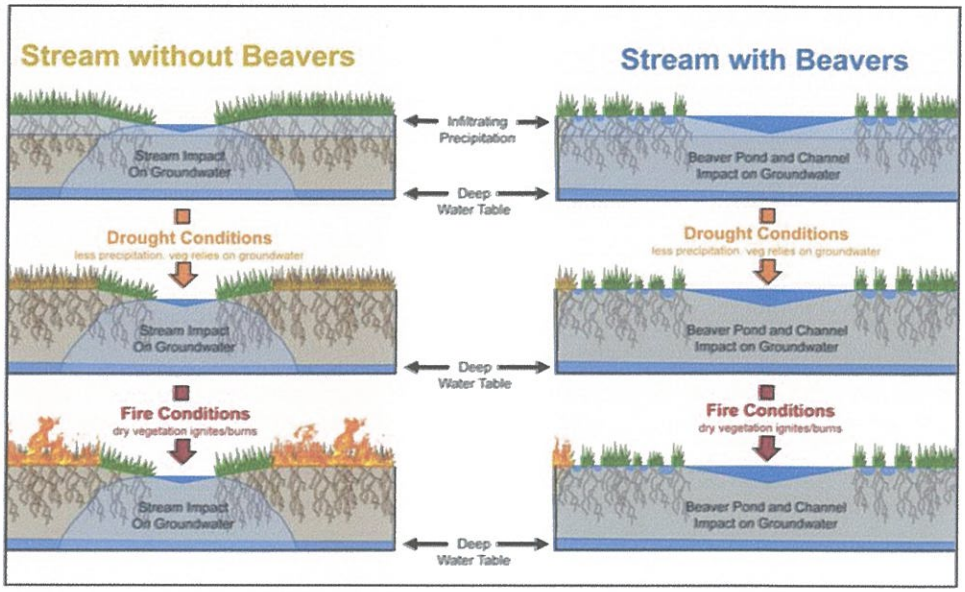


**Figure 5: Conceptual model of vegetation response to normal conditions (top), drought (middle), and fire (bottom) in creeks without beavers (left) and with beavers (right).** (Figure: Fairfax and Whittle, 2020)

**Figure 6: Price Creek, Montana (1998). Section of the creek without beaver dams and ponds. Area downstream of Figure 7.** (Photo: Suzanne Fouty)

**Figure 7: Price Creek, Montana (1995). Section of the creek with beaver dams and ponds. Area upstream of Figure 6.** (Photo: Suzanne Fouty)

wet meadows, riparian areas, and ponds, and they do it for free while providing a host of services for humans, fish, wildlife, and, of course, beavers.

Fire will return. Sooner or later, it will be our community preparing to evacuate as the flames race down hillsides and touch rooftops. It will be our streams with dead fish because they could not survive the elevated stream temperatures and our fields that are struggling. If we want wildfire safety zones to be there when flames light up the hillsides and begin their race in front of the winds, if we want safety zones for wildlife, livestock, and people to find refuge in before the air becomes too hot to breathe and flames touch flesh (Figure 9), then we need to begin now. Even these master builders will require time to recreate the needed water-rich habitats because the number of beavers has been greatly reduced and suppressed.

It is not enough to simply want wildfire safety zones and water banked for the drought years. A partnership with beavers is required, and this partnership will take work, patience, and acceptance of their strengths and challenges. They are amazing, industrious, and determined. They are also annoying and frustrating when they plug culverts, flood fields or roads, or cut down prized trees. But humans are ingenious and also determined, and most of these challenges can be easily resolved in ways that allow beavers and their benefits to remain.

Thus, as we reflect on the September wildfires that changed lives forever on the west side, as we wonder about when it will be our turn to make the hard choices and experience the great losses, we are faced with these questions: Are we, am I, willing to give beavers the space they need create their complex water-rich habitats, and in return gain wildfire safety zones, water banks, quality fish and wildlife habitat, and improved water quality? Are we, am I, willing to seek solutions to conflicts with beavers other than removal and death? Can we, can I, acknowledge their contributions to our collective future? Is it

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**Figure 8: Beaver ponds provide an "emerald refuge" in a landscape burned by the Sharps Fire in Idaho.** (Photo: Joe Wheaton)

**Figure 9: Elk taking refuge in the East Fork Bitterroot River on August 6, 2000, during the Sula Complex Fire on the Bitterroot National Forest.** (Photo: John McColgan)

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acceptable for society, land managers, private citizens, for me to ask firefighters to protect property, put out fires, and put themselves at ever-increasing risk while doing nothing to improve conditions on the ground in those areas that were once rich in water and complexity? These are deeply personal questions as well as community, state, and federal agency questions. How agencies, communities, and individuals answer them and the decisions that follow will determine much about the future that awaits our wild and human communities.

Fairfax, E. and A. Whittle. (2020). Smokey the Beaver: beaver-dammed riparian corridors stay green during wildfire throughout the western USA. Ecological Applications. 18p.■



## Grande Ronde Model Watershed
## Upcoming Board Meetings

**Tuesday, November 24th, 2020**
**5:00 p.m.**
*Location To Be Determined*
*please call for information*

*The public is welcome to attend.*

COVID-19 Update: Meetings will be available virtually. Please call to request information.

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**Grande Ronde Model Watershed**
1114 J Avenue | La Grande OR 97850
Ph. 541-663-0570 | Fax 541-962-1585

WWW.GRMW.ORG



**Margaret McGladrey** | Ripples Editor
**grmw.ripples.editor@gmail.com**

# RIPPLES IN THE GRANDE RONDE

SUMMER-FALL EDITION 2020

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


## Become a Community Scientist!

HELP NATURAL RESOURCE PROFESSIONALS COLLECT DATA

by Ian Wilson, *GRMW staff*

**North American beaver (*Castor Canadensis*)**

As Oregonians, we value fish, wildlife, and clean water as well as conservation of these resources. Fortunately, we have a partner that can create and maintain these resources now and into the future. Our official state animal, the North American beaver (*Castor Canadensis*), was once abundant in Oregon and throughout North America. Through successive generations of dam-building and sediment deposits, our landscapes were transformed by beavers into fertile valleys that have benefited humans, fish, and wildlife alike. However, an intense fur trade in the 19th century and alterations to stream channels and riparian vegetation in the 20th century have reduced our iconic neighbor to a nuisance animal known for blocking culverts and felling one too many trees.

I often tell people that beavers do my job of restoring streams, but they do it better and cheaper than I can. So, how can we ensure more beavers are on the landscape to provide these valuable ecosystem services? First, we need to understand where they are and what kinds of habitat they prefer to help natural resource managers make informed decisions and create conditions favorable for beavers to colonize.

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