



# Legislative Funded Projects Set to Improve Habitat and Surface Water Management in the Harney Basin

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Last year, the Oregon legislature designated \$2.5 million to the Harney Basin Wetlands Collaborative (HBWC), a collaborative of the High Desert Partnership, to fund projects for wetlands restoration.

The projects selected by HBWC partners include studies looking at bird habitat, plant management, ditch maintenance, diversion improvements as well as the installation of an electric carp barrier among other projects. All of the projects have the goal of benefiting migratory and resident bird populations as well as assisting landowners with water management.

*Pictured: Flood-irrigated wetlands of the Harney Basin by Brandon McMullen*



## ***Acoustic Doppler Current Profiler to Measure Streamflow***

One project is the acquisition and use of an acoustic doppler current profiler (ADCP) to measure streamflow on the Malheur National Wildlife Refuge and throughout the Harney Basin along the Donner und Blitzen River, the Silvies River, and other streams in the basin. An ADCP allows for the efficient collection of streamflow measurements while ensuring safety; partners using the device can remain on bridges instead of wading in fast moving water.

There are many water quantity and water availability questions that can be answered with streamflow data collected by the ADCP. For example, the project will: 1) measure streamflow to quantify the irrigation take from the mainstem of the Donner und Blitzen River; 2) evaluate the effect of the refuge's water management on water quality parameters including turbidity and water temperature; and 3) measure the quantity of water needed to flood land to create wet meadow habitat. The HBWC partners are interested in the timing, depth, and



duration of flooding that maintains high quality wet meadow habitat, which will foster the population of migrating birds that stop in the basin on their way north in the spring.

*Pictured is the ADCP during a training March 26-27, 2024, that the US Geological Survey provided to refuge staff and High Desert Partnership staff along the Donner Und Blitzen River. Picture by Brandon McMullen.*

### **Reed Canary Grass and Birds**

This project will look at three different levels of reed canary grass composition at four different sites in the Harney Basin. HBWC partners Tony Svejcar, a retired rangeland scientist and research leader with the U.S. Department of Agriculture; Esther Lev, a project manager, and Teresa Wicks, a biologist with the Bird Alliance of Oregon (formerly Portland Audubon) stationed in Harney County, are working on this project together.

“In general, outside of its native range, reed canary grass is known to eliminate habitat for most wetland and wet meadow bird species,” Wicks said.

Svejcar noted that while reed canary grass is a desired species in the Midwest, it has proven problematic in the Harney Basin by completely overwhelming certain areas and creating a monoculture. However, in mixed stands of reed canary grass there is some evidence wildlife can benefit from the cover, Wicks noted. This is why the study will look at different levels of reed canary grass within different sites.

The three different vegetation structures are areas with solid reed canary grass, areas with some reed canary grass that may become completely invaded and areas that don't have much reed canary grass at all. They will compare these three different stands of plant composition at four different locations. “We're looking at when the water comes and how long it stays, the plant species composition and structure, and the insects, which are a food source for a lot of birds,” Svejcar said.

They will use song meters to determine the bird composition in each area. Song meters record bird songs to help biologists identify species of birds present in targeted areas. Wicks noted that the song meters are programmed to record at the same time every day and are typically very good at not only capturing common birds, but uncommon birds.

“This project will not only help us understand how birds respond to different levels of reed canary grass invasion, but also develop an understanding of how different guilds of birds respond,” Wicks said. “This will allow us to create treatment options that are not only informed but designed to create the most benefit to diverse bird species. Additionally, our hope is that this information will help us develop an understanding of wet meadow quality and the difference between ‘available habitat’ and ‘quality habitat’.”



### **Testing Management Options for Reed Canary Grass**

Another project looking at the management of reed canary grass will involve test plots at the Eastern Oregon Agricultural Research Center. This work will allow researchers to test out different strategies to try and inhibit reed canary grass from producing a monoculture.

With the test plots, “we'll actually cut it at different times, and see what it does to stand structure,” Svejcar said. “We want to do things to disfavor it, but if we have to live with it, what can we do to alter stand structure so that maybe it isn't quite so overwhelming and doesn't just form an absolute monoculture.”

Lev added that “what we're trying to understand is that if we cut it or we manage it differently, could it work for birds and for nesting.”

“This will provide a better understanding of management options and how to provide the best quality habitat for migratory and breeding birds,” Wicks said.

*Pictured above a wall of Reed Canary Grass on the edge of a harvested meadow north of Burns.*

### ***Irrigation Ditch Pilot Program***

Sam Artaiz, SONEC (Southern Oregon Northeast California) Partner Biologist who works with both the Harney Soil & Water Conservation District and the Harney District Natural Resources Conservation Service, said the Irrigation Ditch Pilot Program came about in talking with local landowners. Even if landowners maintain their own ditches, there are often ditches upstream that were not maintained that affect the flow of water downstream. “The pilot program is feeling out what the need is within the county and understanding what the protocol is for cleaning a ditch,” Artaiz said.

This project will involve identifying ditches for maintenance, which includes sediment removal, setting ditch bottom elevation, fixing ditch dimensions, fixing blowouts, and cleaning out vegetation. The goal is to work on at least three miles of ditch in 2024 and complete additional miles in 2025 with multiple landowners.

Well maintained ditches offer the benefit of conveying water more effectively. “Once the water is checked and in the ditch, a cleaner ditch is going to be able to move that water more efficiently to the fields, so the landowners are able to get the water on the field sooner and longer,” Artaiz said.

### ***Updating Outdated Flood Irrigation Structures***

These projects include developing designs for the Riggs Diversion Project, the Soldier Creek Wet Meadows Project, the Smith Brothers Diversion, Ditch and Culverts Project and the Cow Creek Wet Meadows Project. It also includes providing restoration funds for the Dunn Dam Diversion Implementation Project.

The Dunn Dam Diversion Implementation Project is a shovel-ready project that is ready to be built. All the other projects involve engineering design, surveying and permitting work. Some of these projects involve replacing instream structures such as push up dams, check dams or other diversion structures. The goal is to replace these outdated structures that are falling apart and replace them with structures that are up to state codes and allow for fish passage.

Some of the projects are system wide structures that are larger and deal with more land, larger water flows and need larger culverts or checking structures to make them work. The Soldier Creek project, for example, has berms that have been blown out since they were built many years ago. “They didn't engineer them quite right and the elevation of culverts along those dams was off enough and too small so that during these high flows it rattles out the culvert,” Artaiz said. “We're looking to re-level them, find a level that works and put appropriate size culverts there.”

### ***Rickman Wet Meadows Flood Irrigation Projects***

The Rickman Wet Meadows project is a shovel ready project that will involve culvert work and ditch work for 101 acres of flooded wet meadow habitat.

Artaiz said this project is an example of what he is trying to do with some of the other wet meadow projects. “We're trying to get them all shovel ready and sitting on the shelf so when something like this occurs and we have funds, you can essentially pull them off the shelf and fund them,” he said.

The project is located east of Highway 78 by the airport outside of Burns and furthers the collaborative's goals of working with landowners to better irrigate the wet meadows for both economic and ecological purposes.

### ***Fields Flood Irrigation Projects***

There are three projects near the town of Fields in the south end of Harney County that will also work to improve diversion structures, ditches and provide fish passage for streams and wet meadows in that area.

The Trout Creek Diversion Project and the Casey Wet Meadow Diversion Structure Project, both involve installing checking turnout structures with fish passage to allow the Alvord chub to pass through the streams there.

The Colony Creek Wet Meadow Project, involves a system wide flood irrigation structure. Artaiz said the archaic system that is currently in place is essentially a bunch of ditches that move water and have been blown out. "The goal is to engineer something with a few control structures that allows them to flood irrigate during low water years, medium water years and high water years without blowouts occurring," he said. This will allow landowners to open spillways when the water flow is high so they can maintain the structure of the ditches without erosion or damage to the structures.

Maintaining these wet meadows will also create better habitat for migrating birds, such as curlew, that pass through the area. In addition, because the haying season occurs so late in the wild flood irrigated meadows in the Harney Basin, it allows grassland birds, such as the Western meadowlark, to nest and fledge their young before the hay is cut.

### ***Electronic Carp Barrier and Automated Carp Removal Project***

The invasive carp have been a problem in Malheur Lake for years. For this project, the Malheur National Wildlife Refuge will work with an organization, Carp Solutions, to install a barrier for carp at the current boat launch area near the mouth of the Donner und Blitzen River. The barrier will stop adult carp movement into the five-mile stretch of river that includes an important carp breeding area and deep water refugia. The system includes an automated fish trap that will assist in the removal of carp and will be designed so that, during extreme high-water years, it can be removed to prevent damage to the system. The carp, which are larger than the native fish species, will be trapped and removed, while the smaller native fish will be able to swim through the barrier up stream.

"We currently remove carp with electrofishing, which takes a large crew and involves hand netting and handling each fish and lifting each fish by hand in the cold, muddy water up a steep bank. This system is time consuming, expensive and hard physical labor," said Dominic Bachman, Aquatic Biologist with the Malheur National Wildlife Refuge. "With the new ebarrier system, imagine an escalator in the mall where you push a few buttons, and the fish ride up it directly into the back of a truck."

The system will initially be installed and powered by a solar unit and generator with the possibility of connecting it to power in the future.

Bachman noted that until 2022, it was hard to imagine Malheur Lake without the carp problem. During that low water year, they were able to manually remove the vast majority of carp from the lake and reduce the population to a few hundred individuals. "During 2023, we saw a window into what a carp-free lake would look like including lots of clear water, invertebrates, submergent vegetation and incredible diversity and amount of migratory birds nesting and staging on the lake," Bachman said. "We believe this is what a carp-free lake would look like, and it would only improve over time."

### ***Snowpack, Rainfall and Finding Patterns to Aid Landowners with their Management Choices***

The goal of this project is to look at the patterns of rainfall and streamflow data for the past 20 to 30 years for the Silvies River and Donner und Blitzen River watersheds and try to better predict for landowners how varying snowpack and rainfall will affect their operations. This project will also look at how this affects the community economically.

"If you're a hay producer or you're a wildlife manager and you're looking up at the hills and seeing no snow, what are your chances of actually getting some flow in the spring from rain?" Svejcar said. "We're trying to dig into these patterns a little bit and see if we can make more sense of this variable climate we have."

"At the end of the day, all we're trying to do is give people the best information at the time to make decisions and then also to adapt and make changes as needed," Lev added.

### ***Mapping Vegetation of Harney Basin Wetlands***

Svejcar and Lev are also heading a project that will contract with Open Range Consulting to develop a vegetation map of the Silvies Valley, Diamond, and Riley/Silver Creek to match the existing map used on the Malheur National Wildlife Refuge. The

project will create a map that will become the base map for tracking Harney Basin change over time in response to the collaborative's projects and investments.

"This will help with decisions about infrastructure. For example, where do you clean ditches and where do you need to spread the water a little bit more because you're not getting the kind of meadow vegetation that you should have," Svejcar noted. "It'll help people make decisions about using their water and controlling weeds" This project will help to maintain a desirable habitat in the wild flood-irrigated wet meadows.

### ***New Partnership Outreach and Engagement***

One aspect of this outreach and engagement project will involve Burns High School students helping collect data on macroinvertebrate species presence within three different reed canary grass areas at Baker Ranch, Bell-A Ranch, the Eastern Oregon Agricultural Research Center and the Malheur National Wildlife Refuge.

While the data collection is helpful, Lev said that giving students the chance to gain experience in a field they might eventually choose as a career is valuable. "The ultimate goal is giving them that opportunity to be involved in something that's making decisions in their community. It's letting them have networks and different ways to use interest in biology or the outdoors or even ranching in their careers. It's a mentoring program," she said.

Another aspect of this project will help young adult ranchers form informal discussion groups to talk about ranching, challenges and opportunities in response to changing hydrology, weather and economics. "It's really for them to get together for pizza and beer and just talk about climate change, what they might do, what they consider risks or liabilities or what ways that they might want to manage things differently than their parents," Lev said.

The Harney Basin Wetlands Collaborative chose all these projects because they support the ecology of the basin as well as the economic and community needs of the basin. "Many of these projects are working with private landowners, and the projects will support agricultural needs and wildlife needs," Petschauer said. "HBWC partners are implementing these projects, and the data that is being collected, the lessons learned and outcomes will be shared in the collaborative and community wide."

That means that not only will these projects reap immediate benefits in terms of wildlife habitat and water management, but the results and data collected will benefit the basin for years to come.

*This article is provided by High Desert Partnership; a Harney County nonprofit convening and supporting six collaboratives including the Harney Basin Wetlands Collaborative.*

