Dam Replacement Projects Manage Water More Efficiently, Provide Better Bird Habitat

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by Lauren Brown

Since 2019, the High Desert Partnership's Harney Basin Wetlands Collaborative and a participant in the collaborative, Ducks Unlimited, have worked together to replace five key water diversion structures in the Harney Basin.

The new dams replaced derelict structures that were 75 to 100 years old. "These structures were largely a hodgepodge of crumbling cement, wood or rested metal braces that were operational burdens and were oftentimes dysfunctional either because they couldn't appropriately divert water or they were in danger of breaches," said Ashley Tunstall, Ducks Unlimited Southeast Oregon Biologist. Tunstall has been involved in overseeing these projects as well as monitoring them afterward.

In most cases, installing new structures would have been financially out of reach for individual ranchers. Through Oregon Water Enhancement Board (OWEB) grants and other funding, the Harney Basin Wetlands Collaborative (HBWC) and Ducks Unlimited can obtain funding for the necessary engineering and planning costs as well as the removal and construction of the replacement dams. The new structures offer ranchers and land managers a safer and more efficient way to manage flood irrigated meadows. These irrigated meadows also provide better migratory bird habitat.

Tyler and Sweek Dams

In 2019, the collaborative's goal with the Tyler and Sweek dams, was to focus on dams higher in the water system so that the benefits could be appreciated lower down, possibly impacting thousands of acres of irrigated meadows. At the time, the cost of repairing or replacing the dams was $500,000 or more per structure.

The HBWC and Ducks Unlimited sought to help landowners with the cost of replacing dams so that flood irrigation practices could continue to benefit both ranchers and migratory birds.

Pictured top to bottom: Tyler and Sweek dams.

Historically, flood irrigation has been the way ranchers have irrigated their meadows. The HBWC and Ducks Unlimited encourage the use of flood irrigation because of the benefit to wildlife. Flood irrigation also offers hydrologic benefits in terms of recharging the aquifer. This is key as the Harney

Basin faces new rules on groundwater use from the Oregon Water Resources Department.

Cote and Rose dams

The Cote and Rose dams were completed in November 2023. The Cote Dam is located on Silver Creek downstream of Moon Reservoir, while the Rose Dam is located on the east fork of the Silvies River. Both dams were old and in need of replacement. The Cote Dam's concrete was crumbling and in danger of washing out.

The HBWC started the process of updating both dams in 2019 with survey and design grants, but the projects stalled during the COVID-19 pandemic. They were eventually revived when Ducks Unlimited was able to step in with funding to move the projects forward. OWEB awarded restoration funds to complete the construction of the structures in 2023.

Rancher Gary Marshall, who uses Cote Dam to divert water, said the new structure is safer and more efficient. In addition to flood irrigating hay meadows and recharging the aquifer, Cote Dam also helps to create 3,000 acres of wet meadow habitat that can be used by wildlife and migratory birds.

Improving grass hay production provides more wetland habitat acres with those flood irrigation practices. "This can support many more migratory birds even years of extreme drought because the water can be moved more effectively across the landscape. This is even more important with the increased frequency of drought cycles, much like what the basin is experiencing this year to provide the maximum migratory bird habitat necessary," Tunstall said.

Rose Dam now provides fish passage, bird habitat and helps to maintain compliance with Oregon water rights. It enhances surface water distribution on more than 1,480 acres of historic Silvies River floodplain and seasonal wet meadows.

"These are all the things that come with well managed surface irrigation," Marshall said.

Dunn Dam

The most recent water diversion replacement took place in the fall of 2024. Dunn Dam was an old derelict structure that was built in the 1950s, and it was causing a litany of problems on the Donner und Blitzen River. Operated by the Malheur National Wildlife Refuge, staff were unable to use it for flood irrigation, causing 1,300 acres of wet meadows to be dissociated from the floodplain. High velocity outflows were causing bank undercutting and erosion downstream, and the fish passage system was inoperable.

It took four years for the perfect storm of funding to come together to move the project forward. In the end, the Oregon Department of Fish and Wildlife came through with fish passage funds, OWEB awarded the project Focused Investment Partnership funds, Senate Bill 5506 contributed to the project and a grant from the North American Wetlands Conservation Act was also secured.

When the area was dewatered to start work on the structure, the Xerces Society organized a rescue and relocation of more than 8,000 western ridged mussels that were embedded around the dam. Fish that would have been stranded were also relocated.

According to Tunstall, most of the dam replacement projects in the Harney Basin involve concrete structures with various sizes of weir boards that are pulled as necessary. They often have catwalks with extensions that can be used during high velocity flows. However, the Dunn Dam was replaced with a rock chute structure, which is a system of multiple rock weirs set at certain elevations. It is a passive management system that doesn't require boards to be installed or pulled to manage the water. The water gets diverted at a turnout or lateral diversion spot. "Instead of having to climb all over a dam and pull heavy boards, you're able to do it on a much smaller scale on the side channels," Tunstall said.

The new structure includes a perennially passable fishway that travels down the middle of the rock chute and will always have at least 6 inches of water present so that red band trout moving up and down the system are able to use it.

The Dunn Dam project has corrected a number of issues that the old structure had created. "It fixes the fish passage issue, it slows down the water, arrests erosion, allows the refuge to actually divert that water out onto Wright's Pond and does this all in a way that is safer and more manageable," Tunstall said.

Pictured: The Dunn Dam rock chute mimics the natural stream morphology with a roughened channel.

The spring of 2025 was a wet one in the Harney Basin, but the new Dunn Dam structure did its job to help divert water into areas where water had not been previously. "I was told by some of the partners in the wetlands collaborative that when they went out last spring, there was water all over Wright's Pond," Tunstall said. "They stood there and saw all these resident birds that were nesting and all these other migratory birds and that it was this profound, beautiful moment of seeing birds robustly utilizing an area that they had not been for so long."

These key water diversion projects have benefited both ranchers and wildlife in positive ways. "These are the goals we set out to achieve whenever we do these replacement projects," Tunstall said. "We want to make water management easier and safer for landowners, and this ultimately impacts more contiguous acres of wet meadows as a result because you're able to spread the water farther with improved irrigation efficiency and water conveyance."

This article is provided by High Desert Partnership; a Harney County nonprofit convening and supporting six collaboratives including the Harney Basin Wetlands Collaborative and the Malheur National Wildlife Refuge Comprehensive Conservation Plan.

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