

Henrys Fork Salinity Control Area

M & E Report

2016



The Henrys Fork River is tributary to the Green River which is a primary tributary to the Colorado River. The Colorado River provides domestic and industrial water for some 35 million Americans and is used to irrigate approximately 4 million acres of land in the US. The river also provides irrigation, domestic, and industrial water to Mexico. Water deliveries from the U.S. to Mexico are governed by treaties between the two countries that prescribe amounts and quality of the water delivered.

The early 1970s saw significant concern by water users over the increasing salinity of the Colorado River. Annual damages from dissolved salts in the lower basin of the Colorado River have been quantified as high as \$350 million. Not only were damages increasing from rising salt concentrations but the passage of the Clean Water Act foreshadowed pending regulation unless water quality could be maintained. The seven states developed a response to the CWA that provides numeric criteria for total dissolved salts (TDS), a plan of implementation of salt control measures, and a review of the standards every three years. The seven states who share Colorado River water as governed by the Colorado River Compact petitioned Congress resulting in enactment of the Salinity Control Act in 1974. The Act provides an authority to meet the needs of the states as well as meet the treaty obligations to Mexico.

Salinity control projects have been implemented throughout the Colorado River Basin by the actions of local, state, and federal partners. The USDA Natural Resources Conservation Service currently administers 11 projects in the three states of Colorado, Utah, and Wyoming. Through the combined actions of all the partners, the salt load of the Colorado River has now been reduced by about 1.2 million tons annually. In order to maintain the current water quality (with respect to salinity concentrations), prevent increased damages, and allow for full development of water resources under the Colorado River Compact an additional .5 to 1 million tons of salt control are needed by 2030. The Natural Resources Conservation Service has developed this plan and EIS to reduce 6,540 tons of annual salt loading to the Colorado River system by implementing conservation practices in the upper Henrys Fork project area.

The Henrys Fork area was not identified by name in Title II of the Colorado River Basin Salinity Control Act, but was identified by USDA as an area which should be studied for possible salinity control. The salt loads from the project area entering the Colorado River contribute to overall salinity concerns.

The combined Plan and Final Environmental Impact Statement has three major components: (1) to determine the contribution of the salt loading to the Colorado River from irrigated hay and pasture land; (2) to reduce salt loading through improvements in on-farm irrigation delivery and application systems; and (3) to determine environmental effects of the recommended plan, Alternative B – Irrigation System Improvements.

Recommended Plan

The recommended plan is to implement Alternative B – Irrigation System Improvements.

Through implementation of this alternative, on-farm irrigation application system improvements will occur at an accelerated rate as producers voluntarily sign-up for improved irrigation systems. It is estimated that through this alternative 70 percent of the irrigated acres in the project area will have improved irrigation systems. Most of the surface irrigation systems will be converted to side roll, center pivot, and pod sprinkler systems. The remaining 30 percent will remain as an unimproved irrigation system.

A limited amount of on-farm delivery ditches that transport irrigation water from the canal to the field will be improved by converting from dirt ditch to buried pipe. This will reduce seepage and salt loading from these delivery ditches by 99 percent. There are no canal modifications (i.e. conversion to pipeline or canal lining) included in this plan.

Currently, there are five improved irrigation systems scheduled to be implemented in 2016. These five systems include center pivots as well as podline systems. The total acres for these five systems is 143.1 acres

Prior to the area becoming a salinity control area, there also has been seven systems installed. These seven systems include center pivots as well as podline systems. The total acres for these seven systems is 485 acres.

The total acres treated to date is 632 acres.

Wildlife/wetland replacement assessments and replacement projects

Wetland Assessments - Prior to Irrigation System Installation

- Pallesen pod-line- 2.1 irrigated acres assessed and 0 wetland acres found. The project site consisted of dry upland habitat at the top of a slope, with no wetland values present. There is alfalfa/grass on the south section that receives some pivot irrigation, but the remaining has white-top, tansy mustard and bare ground with abundant prairie dogs.
- **0** total wetland habitat values lost.



Photo 1: Pallesen assessment area proposed for pod-line, June 2014.

- Thomas pod-line- 27.6 irrigated acres assessed and 1.3 wetland acres found. This project site consisted of mostly dry upland habitat with a ditch that runs on the north side of western pasture. There are sedges and rushes present along the ditch and pockets in surrounding area, suggesting some ponding may occur. Mossy, damp soils, sedges and arrowgrass on lower (north) portion of the pasture suggests ponding occurs often at base of slope.
- **3.77** total wetland habitat values prior to irrigation improvement



Photo 2: Thomas assessment area proposed for pod-line, July 2015.

- Crowther pivot- 40.0 irrigated acres assessed and 2.95 wetland acres found. The section of the pasture that is west of the road consists mostly of upland sagebrush with various field grasses, white top and yellow sweet clover. Saturated soil and wetland characteristics are located in a small patch on the north western edge of the AA. This is caused by overflow from the irrigation ditch to the west. There is a large ravine that runs through the middle of the AA. This ravine delivers irrigation water to lower pastures and seasonally supports shrub-scrub wetland habitat. This is evident by the serviceberry bushes that line the ditch, as well as sedges and rushes. The eastern edge of the AA consists mostly of field grasses and upland habitat, with the exception of the irrigation ditches and depressions along those ditches. Wetland vegetation (sedges and rushes) are present all along the ditches. The depressions contain mossy, saturated soils.
- **7.67** total wetland habitat values prior to irrigation improvement.



Photo 3: Crowther assessment area proposed for center pivot, July 2015.

- D. Slagowski Pivot- 25.1 irrigated acres assessed and 1.02 wetland acres found. Most of the pasture consists of field grasses and dry upland habitat. Prairie dogs present. Pasture is sloped on north and west sides, draining into the eastern edge of the pasture. Some depression wetlands are present due to seasonal irrigation. Spike rush, soft stem bulrush and sedges are present in these depressions, as well as standing water.
- **1.84** total wetland habitat values prior to irrigation improvement.



Photo 4: D. Slagowski assessment area proposed for center pivot, June 2015.



Photo 5: Standing water present at toe of slope on the south-eastern edge of the D. Slagowski pasture, June 2015.

- R. Slagowski Pivot- 48.4 irrigated acres assessed and 5.0 wetland acres found. The pasture is irrigated by a wheeline sprinkler. The most abundant plant species include field brome, timothy grass, alfalfa, and several species of sedges. The majority of the field has dry upland habitat characteristics, while the depressions contain wetland characteristics, including standing water. Common arrowgrass and wild iris are present at toe of slope. Surrounding area is mostly arid sage and juniper habitat with a few roads nearby.
- **15.00** total wetland habitat values prior to irrigation improvement.



Photo 6: R. Slagowski assessment area for proposed center pivot, June 2015.



Photo 7: Eastern edge of pasture, where irrigation run-off collects in depression, June 2015.

Completed Habitat Replacement Projects

- Peoples Canal Fish Barrier- The Peoples Canal diversion dam is located at the downstream end of the drainage on BLM land. This structure is keeping recently introduced burbot and other non-desirable non-native fish species in Flaming Gorge Reservoir from moving into the system. In 2009, the Peoples Canal Irrigation District piped the canal and installed an intake structure. However, the old wooden diversion dam was not improved. This structure could have failed and put the entire Henrys Fork drainage at risk for invasion by non-native fish, particularly burbot. Piscivorous fish of this caliber have had devastating effects on native fisheries across the west. The dilapidated dam was improved to a permanent fish barrier November 2015. It protects approximately 100 stream miles that contain some of the few remaining strongholds for conservation populations of Colorado River cutthroat trout and native bluehead and flannelmouth suckers.
- **178.2** Total habitat replacement values (Reference Replacement Value Calculator)



Photo 8: Peoples Canal wooden diversion prior to construction, April 2013.



Photo 9: Peoples Canal Fish Barrier Diversion after improvements, March 2016.

Planned Habitat Replacement Projects

- Beaver Creek Riparian CRP- Beaver Creek is a tributary to the Henry's Fork River. The Lonetree Ranch plans to enroll an approximate 1.2 mile section of Beaver Creek in the CRP program that will benefit Colorado River cutthroat trout in Beaver Creek. Currently, these sections of Beaver Creek are straight, widened and have incised banks, which provide higher water temperatures in the summer and little in-stream structures for trout. The bank erosion also contributes to higher sediment load in the creek. These improvements will help restore trout to the lower sections of Beaver Creek. They will also help reconnect trout to the Henry's Fork and promote connectivity among populations. The Molly Bullock pasture has erosion and bank stability issues and would benefit from livestock exclusion. Approximately 16,200 feet of 4-strand wildlife-friendly electric fence with livestock watering gaps will be built to exclude livestock from approximately 1.2 stream miles of Beaver Creek in the Molly Bullock pasture. Water gap placing has yet to be determined, but will likely be placed in current cattle crossing areas (approximately 3-4). Approximately 18.48 acres will be enrolled in CRP for 10 years. Cattle exclusion will promote riparian recovery. Anticipated completion is summer 2016.
- **60** estimated total habitat replacement values (Reference Replacement Value Calculator)



Photo 10: Proposed section of Beaver Creek in Molly Bullock pasture for CRP fencing, July 2013.

- Blue Bell Diversion Improvement- The Blue Bell diversion is one of the largest push-up dams on the Henry’s Fork River. The landowner has to restructure the dam several times during the year, usually in the spring and early-summer. Restructuring involves operating large equipment in the river, often during spring run-off and critical native fish spawning periods. If river flows are low, the Blue Bell dam becomes a seasonal fish barrier. Improving this diversion will allow native fish to access habitat needed during different life history stages and will promote connectivity between populations, thereby improving genetic integrity and the likelihood of persistence. This project will replace the push-up diversion with a low-maintenance and fish-passable rock vane structure. A second rock vane structure will be placed below the first to help stabilize the river channel bed and prevent erosion further downstream. Rip-rap will be placed above the diversion to stop the current head-cut from further bank erosion. An open-topped, steel head-gate will be placed a few yards upstream of the existing point of diversion and a new canal will be constructed to the confluence with Burnt Fork Creek. Two more head-gates will be placed at the confluence of Burnt Fork and the Blue Bell ditch to help producers better manage their ditch operations. A bypass, located next to the Burnt Fork Creek head-gate will allow fish passage throughout the year and will pass excess flows during run-off. This project will seasonally reconnect an estimated 35 river miles. Anticipated completion is spring 2017.
- **87.3** estimated total habitat replacement values (Reference Replacement Value Calculator)



Photo 11: Blue Bell push-up diversion, October 2015.

- Beaver Creek Diversion Improvement- A recent study found that the lowest diversion on Beaver Creek is a fish barrier in the late-summer months. The current structure is a push-up dam that requires frequent maintenance by the landowner and diverts water into an open ditch. This project will improve the diversion to a low-maintenance and fish passable rock vane structure. A head-gate will also be installed to allow the landowner more efficient control of his irrigation water. This project will benefit native fish and the landowner by improving connectivity between genetically-pure populations of Colorado River cutthroat trout and improving the producer's irrigation infrastructure. This project will also eliminate the need for the landowner to use large equipment instream to restructure his diversion several times a year. This project will seasonally reconnect an estimated 6 stream miles. Anticipated completion is spring 2017.
- **14.9** estimated total habitat replacement values (Reference Replacement Value Calculator)



Photo 12: Beaver Creek push-up diversion, July 2014.

Considerations and Conclusions

There are a total of 5 irrigation improvement projects with 143.1 total irrigated acres that have been assessed in the Henry's Fork Salinity Control Program area. Wetland assessments were performed during irrigation season to best identify all wetland characteristics possible. All pastures assessed were on sloped fields, with very little wetland habitat found. The wetland values that were found were located along ditches, in depressions and toe ends of slopes. Most of the fields are a mix of dry upland habitat and field grasses. Yellow sweet clover, white-top and tansy mustard were also present in most of the fields. Prairie dog colonies are common in the drier sections of the pastures.

Of the 10.27 wetland acres assessed, moist soil characteristics were found, along with sedges, rushes and other hydrophytic plants. Some areas had stand water present and others had moss covering sections of the soil. All of the wetlands found are seasonal irrigation induced wetlands. They have very little structural diversity and will likely provide no more than incidental habitat for most wildlife in the area. Some of the wetland acres had standing water and provide some groundwater recharge potential. However there was less than an acre foot in each and they are seasonal, so they have low water storage potential. The characteristics found in these wetland acres are common in irrigated lands found in the Henry's Fork drainage, so they received low uniqueness rankings. No recreational or education potential was found. The table below summarizes the habitat values present, based on the Montana Wetland Assessment Method.

Name	Irrigated acres Assessed	Wetland Acres Assessed	Total Habitat Values
Pallesen Pod-line	2	0	0
Thomas Pod-line	27.6	1.3	3.77
Crowther Pivot	40	2.95	7.67
S. Slagowski Pivot	25.1	1.02	1.84
B. Slagowski Pivot	48.4	5.0	15.00
Total	143.1	10.27	28.28

Table 1: Henry's Fork Salinity Control Program projects and habitat values assessed.

There has been one habitat replacement project completed, the Peoples Canal Fish Barrier. There are 3 other planned projects, which are summarized in the below table.

Name	Habitat Value	Replacement Value Totals
Peoples Canal Fish Barrier	100 stream miles protected	178.2
Beaver Creek Riparian Fencing	18.48 acres excluded from grazing	60 estimated
Blue Bell Diversion Improvement	35 stream miles seasonally connected	87.3 estimated
Beaver Creek Diversion Improvement	6 stream miles seasonally connected	14.9 estimated

Table 2: Henry's Fork Salinity Control Program habitat replacement projects and values.

The replacement projects which have been installed and the replacement projects that are planned to be installed show the effort to meet the current and proportional requirement US F&W wants happening in a salinity control area. It has been discussed and agreed on the replacement values/acres in the Henrys Fork area are not the traditional wetlands created compared to other salinity control areas. Due to the small acreages and shortage of water, other methods would be used to meet the replacement values.