Prepared for
Colorado Water Conservation Board
Watershed Restoration Program
Attn: Chris Sturm

Florida River Habitat Improvement Project Phase 3

Grantee: Animas Watershed Partnership
Fiscal Agent: San Juan Resource Conservation and Development Council
Grant Amount: $32,500

Prepared by Ann Oliver, Coordinator

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Introduction

The Animas Watershed Partnership (AWP), a collaborative community-based watershed group, engages partners across the Animas River Watershed (Figure 1). The AWP represents diverse interests working together across state and tribal boundaries to protect and improve the quality of water resources in the Animas Watershed. The group is open to all interested parties. Partners include private landowners, environmental groups, municipalities, counties and states, as well as the Southern Ute and Ute Mountain Ute Indian Tribes. The efforts of the AWP are guided by a 9-seat Steering Committee comprised of two local governmental and two citizen seats from both CO and NM, and one Tribal seat.

The AWP Steering Committee meets monthly, rotating between Farmington, NM, Ignacio, CO and Durango, CO. Current members on the Steering Committee represent the City of Farmington, NM, City of Aztec, NM, City of Durango, CO, Southwestern Water Conservation District, CO, San Juan Watershed Group (SJWG), Trout Unlimited Five Rivers Chapter (TU), Southern Ute Indian Tribe, and include two unaffiliated citizens. The Steering Committee is responsible for hosting partnership meetings, shepherding the strategic direction of the AWP, approval of grant applications, community engagement and water quality improvement projects.

The Animas Watershed is 1357 square miles in area and has an 8 digit hydrologic unit code (HUC 14080104). The largest tributary to the Animas River is the Florida River. It is the last perennial tributary to join the Animas River before the river flows into New Mexico, about four miles downstream and to its confluence with the San Juan River, about 33 miles downstream. The HUC for the Upper Animas Valley is 1408010405 and for the Lower Florida River is 1408010410.

Natural stream flows in the Animas Watershed are dominated by snowmelt runoff that occurs between April and July and peaks in late May to early June. Monsoon rains typically occur from July through October and sometimes produce significant stream flows. Low stream flow conditions exist from late August to March. The Florida River Habitat Improvement Project Phase 3 is located along the lower Florida River (Figure 1). Stream flow in the lower Florida River is driven by releases from Lemon Reservoir and by the diversion and return flows of irrigation water downstream of the reservoir. The project reach of the Florida River also receives some return flows of water diverted out of the Pine River.

The lower Florida River provides riparian habitat for terrestrial wildlife species including elk, deer, black bear, mountain lion, wild turkey, golden and bald eagles, yellow warbler, great blue heron and chorus frogs, to name a few. Some reaches support brown trout as well as native warm water fish species (flannelmouth sucker, bluehead sucker and roundtail chub). The River also supports potential habitat for the Southwest Willow Flycatcher, and New Mexico Meadow Jumping Mouse.

The Florida River Habitat Improvement Project Phase 3 carried forward and matched the successes of two earlier projects to implement best management practices recommended in the Animas Watershed-Based Plan. All phases were aimed at improving aquatic and riparian health in this reach of the lower Florida River. In 2012 the AWP secured its first CO NPS 319

Implementation Grant and in 2013 began partnering with a local rancher and the Durango-La Plata County Airport to implement the “Animas and Florida Rivers Habitat and Water Quality Improvement Project” (Phase 1). In 2015, AWP received a Colorado Healthy Rivers Fund grant to complete Phase 2 of the project. These first two phases installed riparian fencing to create a riparian buffer along 1.3 miles of the Florida River and converted about 31.2 acres of adjacent flood irrigated pasture to gated pipe irrigation in order to decrease runoff of nutrients from these pastures to the Florida River. This Phase 3 project brought the total fenced length of river channel to 2.2 miles, enclosing and protecting roughly 48.3 acres of native riparian buffer.

The need for this project was clear: the river in the project reach were not fenced and were grazed year round, resulting in banks with predominantly herbaceous plant cover or bare soil, and erosion of soil and manure into the stream, degrading the aquatic habitat. The river was almost completely unshaded by vegetation, with little structural diversity in the riparian zone.

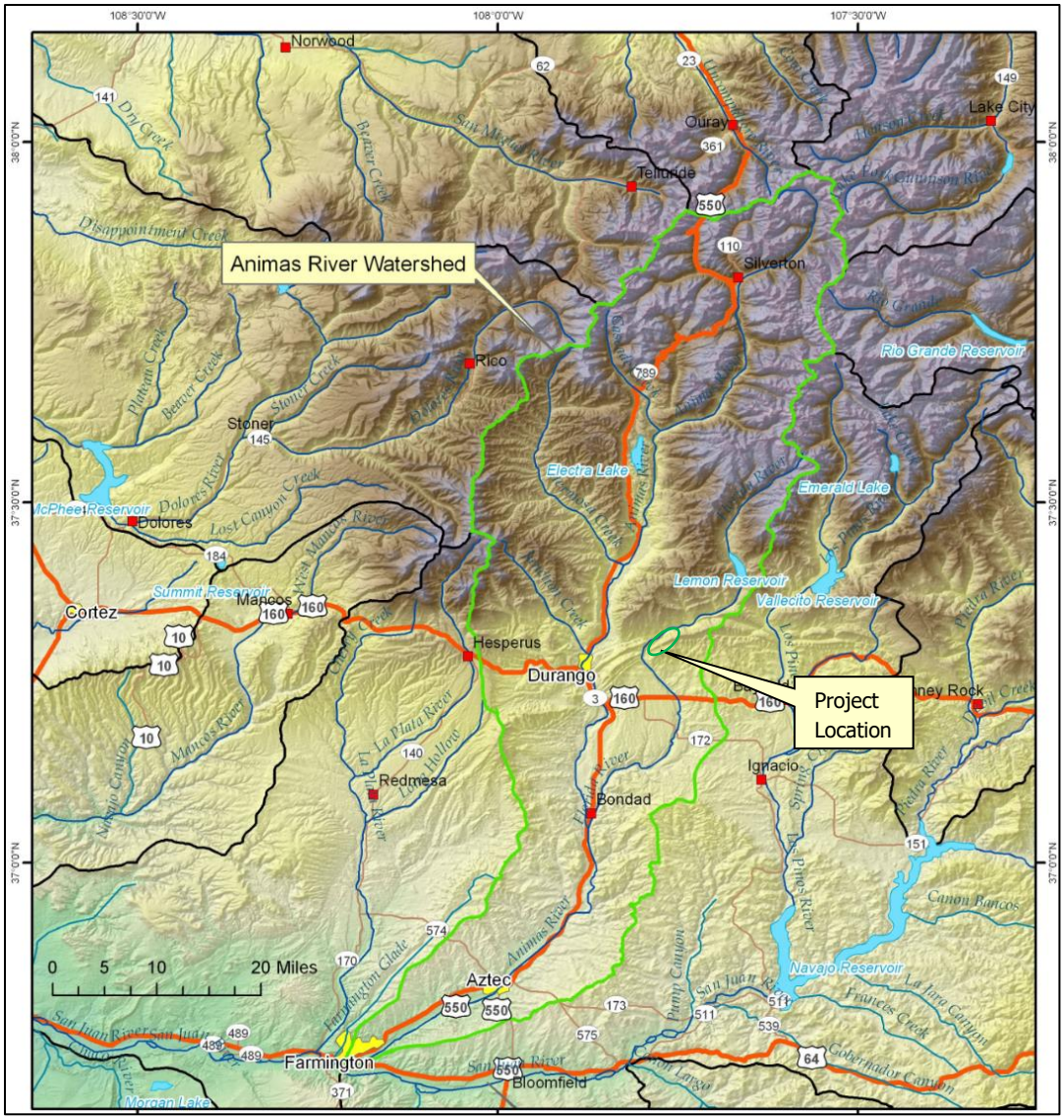

Figure 1 Map showing Florida and Animas River Water Quality and Habitat Improvement Project Phases 1-3 location.

Background

AWP's community engagement and on-the-ground projects are informed by two Watershed-based plans: the Animas Watershed Based Plan (2011) and the Lower Animas Watershed Based Plan Update (2016). Both of these plans identify sources of nutrient loading and recommend BMPs. The Lower Animas Watershed Based Plan also identifies sources and BMPs for bacterial loading.

The Florida River joins the Animas River, about 4 mi. north of the Colorado/New Mexico Stateline, and is the largest perennial tributary to the Animas. Water quality problems on the Animas River associated with the Florida River inflow include chemical pollution (nutrients), biological pollutants (E. coli) and degradation of the physical habitat by turbidity and sedimentation.

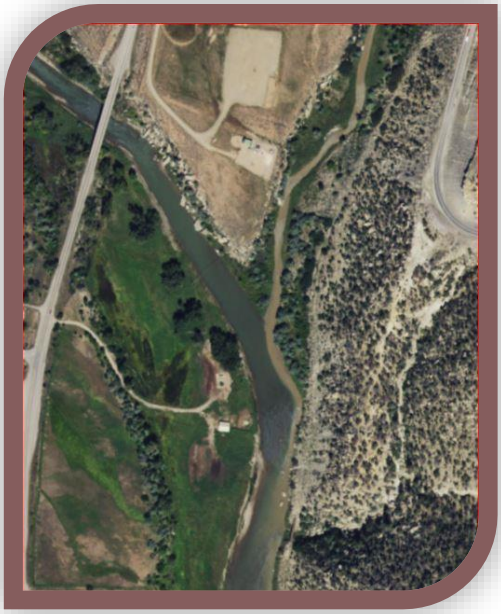

Figure 2. The confluence of the Animas River (flowing downstream from upper left) and the Florida River (flowing downstream from upper right) in 2011.

The Animas River Watershed-Based Plan (2011) reported that the Florida River is a significant source of nutrients to the Animas. AWPs water quality sampling in 2015 showed that the Florida sometimes contributes a high percentage of the load of both nutrients and E.coli carried by the Animas River at the New Mexico/Colorado state line (Figure 2). During the summer months, the Florida River is frequently observed to run more turbid then the Animas at their confluence (Figure 2).

The Animas River Watershed-Based Plan identified flood irrigation as a likely contributor of nutrient loading to both the Animas mainstem and the Florida River. The plan also noted that nutrient enrichment can be exacerbated by the loss of riparian habitat (AWP 2011). By allowing management of livestock out of the riparian zone and away from river banks, the fencing completed in this project can accomplish multiple objectives including improvement of riparian and aquatic habitat; riparian revegetation; erosion control and channel stabilization; as well as water quality improvement.

Monitoring of the Phase 1 reach immediately upstream of the Phase 3 project reach shows rapid regeneration of native woody shrubs following exclusion of livestock from the riverside buffer with fencing. In order to achieve the project goals of reducing nutrient and sediment loading to the stream and bank erosion, and allowing the riparian buffer to re-vegetate we fenced a minimum 30 foot wide buffer from the river, based on Bray's (2010) review of studies on minimum buffer distances.

The primary goal of this project is to protect and improve the aquatic and riparian habitat on the project reach of the Florida River. The project will contribute to improvement of the overall

riparian and aquatic value of the lower Florida River and the Animas River. We hope that more landowners within the Florida River drainage will consider implementing riparian fencing.

Project Objectives

1. Protect river channel and riparian area by fencing approximately 1.2 miles of the Florida River to manage livestock away from the river.

2. Conduct monitoring to assess the effectiveness of fencing to create a riparian buffer and improve channel shading, aquatic and riparian habitat, and improve channel bank stability.

3. Successfully complete the project within approved budget by March 1, 2017.

Project Site Summary

The Phase 3 project reach is located downstream from Hwy 160 on the Florida River (Figure 1). The reach is immediately downstream of Phase 1 which is immediately downstream of the Phase 2 reach. The Florida River has a C4 stream type (Rosgen 1996) as it flows through all 3 project Phases. The river banks in this reach are flanked by irrigated pastures that, prior to the project, supported year round use by livestock (horses and cows) with free access to the river banks and channel. The stream banks were dominated by herbaceous vegetation and largely lack any woody overstory. There was very little shading of the stream. Nevertheless, there is living root stock present of native woody plants including: coyote and other willows, silver buffalo berry, river hawthorn, and skunkbush sumac. There are short lengths of rapidly eroding bank and the channel bed is highly embedded with fine sediments. The landowners have observed that trout have not been plentiful in the reach since the 2002 drought and upstream fires.

The Florida River watershed upstream of the project site comprises the Source Water Protection Area for seven public water suppliers, including Colorado Trails Ranch, Forrest Groves, Colvig Silver Camps, Edgemont Ranch Metro District, El Rancho Florida Metro District and the Durango La Plata Airport. This area is in a mix of public, private and tribal lands, with most of the headwaters under US Forest Service management and the lower elevation lands almost entirely private or tribal. Land uses are residential and irrigated agriculture.

Methods

The Animas Watershed Partnership (AWP) partnered with Carolyn Watson to install approximately 7375ft of fencing to create a protected riparian buffer of native vegetation along both sides of approximately 1.1 miles of the Florida River. AWP will engage volunteers to plant 0.5 acres of willow cuttings within the riparian buffer created by the installed fencing. Pre- and post-project monitoring will track changes in aquatic habitat and riparian vegetation.

Riparian Fencing

Through AWP's work implementing Phases I and 2, we contacted the downstream landowner, Carolyn Watson. During a field visit at her property, Ms. Watson confirmed that she was interested in partnering with AWP to install riparian fencing and to develop robust vegetation within the riparian buffer along the Florida River through her property (Figure 4). The next step was to secure a 5 year Operation and Maintenance agreement with Ms. Watson. Upon AWP's suggestion, Ms. Watson also worked with the Private Lands Wildlife Biologist at the Durango NRCS Office to submit an application for EQIP cost share funding to support the fencing project. The cost share was approved in June 2016 for approximately $6431 for 4660ft fence and $1746 for willow plantings over at least 0.5 acre. This assistance helped to pay for fencing on the west side of the river through the Watson Property.

AWP had already contracted a Contractor to complete fencing for Phases 1 and 2 upstream at a rate of $8/foot, with $2/foot of that provided as in-kind match. We extended that contract past the Phase 3 end date. Prior to any fence construction, the Project Manager, AWP Coordinator Ann Oliver, conducted field visits with the landowner, the fence contractor, and the Private Lands Wildlife Biologist to agree on the fence placement relative to the riverbank. Following completion of individual stretches of fence, and prior to payment of invoices, the Project Manager completed a site visit to certify each fence section complete.

Fencing on the east side of the river began on May 2, 2016. Along the east side 3865 lineal feet of 5 wire barbed wire fence were installed. Ms. Oliver certified the east fence complete on June 22, 2016. This stretch was completed with funding from CO NPS, as well as in-kind contributions from the Fencing Contractor and gates provided by the landowner.

Fencing along the west side of the Florida River on the Watson property began in early September 2016 and Ms. Oliver certified it complete on December 13, 2016. Along the west side, a total of 5053.5 lineal feet of fence were installed. This stretch was completed with funding from CWCB Watershed Restoration Program funding and NRCS EQIP funds, as well as in-kind contributions from the Fencing Contractor and gates provided by the landowner.

Figure 3. Marking fence line at horse pasture water gap.

An unexpected amendment of additional funds to our CO NPS grant allowed the Project to complete more fencing than originally proposed. In August, 2016, 1548 feet of 5 wire barbed-wire fence were constructed on the Phase 1 Fassbender property immediately upstream of the Phase 3 Watson Property (Figure 6). This short stretch of river had originally been left unfenced

in order to provide a substantial water gap for horses kept on the property over the winter. However, Mr. Fassbender decided in 2016 that the long water gap was not necessary and agreed to protect that additional stretch with fencing on both sides of the river. The Project Manager agreed that this was a beneficial use of the funds not only because it would expand the riparian buffer through this section, but also because it is immediately upstream of the infiltration gallery that supplies drinking water to the Durango-La Plata Regional Airport.

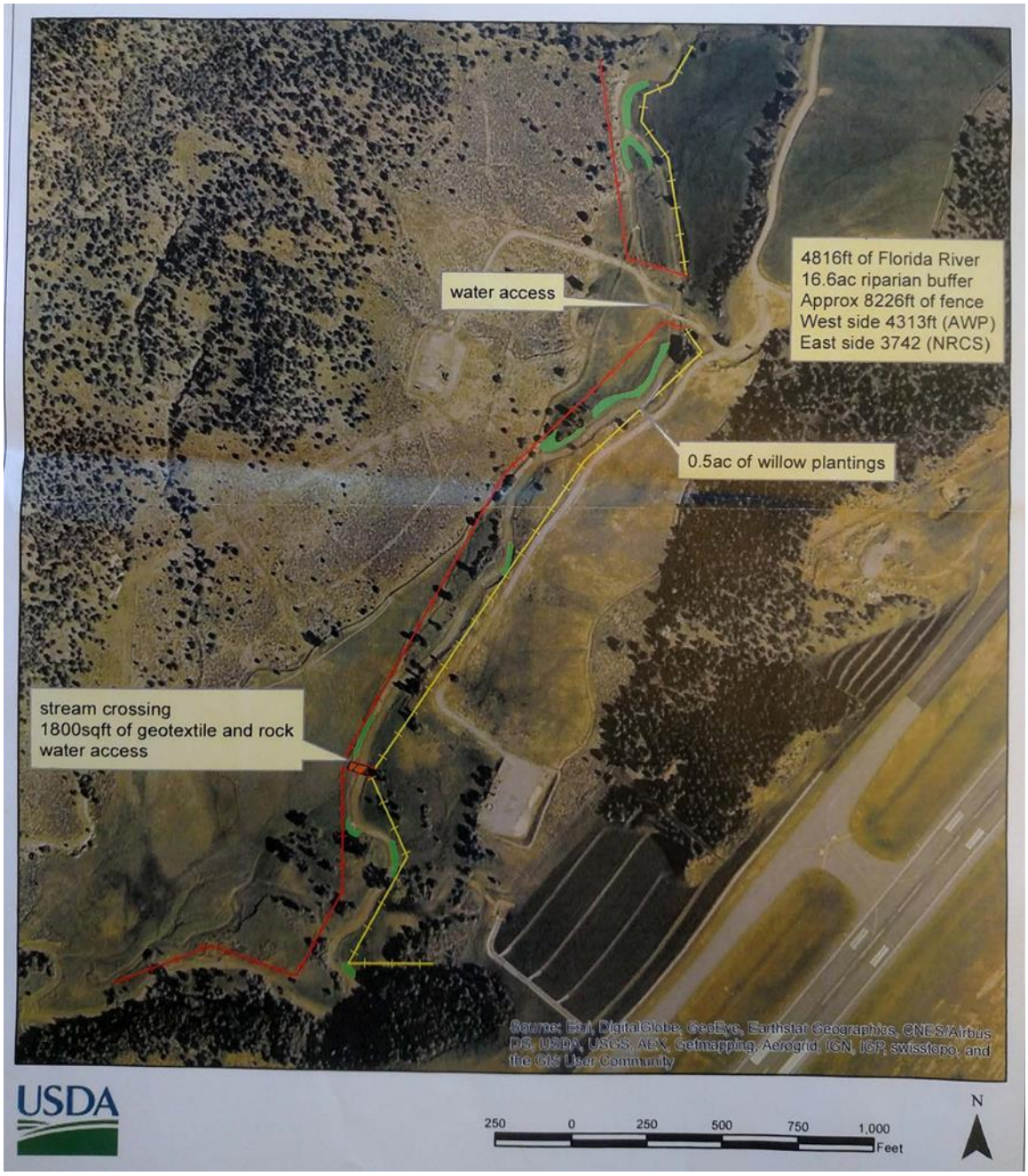

Figure 4. Map of Phase 3 Watson Property new fencing and potential willow planting locations (courtesy NRCS).

Willow Planting

The AWP VISTA Volunteer Rachel Hoffman is coordinating two volunteer workdays in spring 2017 to plant willow cuttings along .5 acres of the river banks inside the riparian fencing of the Project reach. AWP has begun advertising these volunteer days with partners and the public. Based on our experience with two such volunteer days conducted last April (2016) in the Phase 1 and Phase 2 reaches, we anticipate that on each of the April volunteer days at least 10 volunteers will donate 4 hours to harvest and plant willow cuttings along both banks at least 200 feet of channel.

During the April 2016 willow plantings, we had Biscuit Boy Productions produce a video produced of these volunteer events. The video can be viewed at https://www.youtube.com/watch?v=ZZbSOy-kqYs&feature=youtu.be and shows the methodology we plan to employ again this year. On each day, volunteers will use loppers to harvest a large number of coyote and pacific willow cuttings from willow stands on the Watson Property. If necessary, these cuttings will be supplemented with cuttings from nearby Southern Ute Indian Tribe land, thanks to assistance from P. Nylander, SUIT Water Quality Specialist. AWP will rent the "waterjet stinger" tool from the La Plata Conservation District, and volunteers will use this tool to plant the cuttings into and along the bank. As cuttings are inserted into "waterjetted" holes (about 3-4ft deep), volunteers will use buckets to pour a slurry of soil and water into the planted holes, and compact the soil around the step with their heels. These steps help ensure good soil to stem contact within the hole and to minimize any drying out of the stem. As the willows are planted, volunteers will lop the cuttings to extend only 1 foot above ground level, and use the lopped material as another cutting to be planted.

Figure 5. Volunteers planting willows on Phase 2 property, April 2016.

Monitoring

The project is employs two methods to monitor the effectiveness of fencing to create a riparian buffer and improve channel shading, aquatic and riparian habitat, and improve channel bank stability. AWP has documented the pre- and immediate post- fencing condition with photos. In addition, AWP conducted pre-project Rapid Stream Riparian Assessments (RSRA) (Stacey 2004)

on the Phase I reach, and plans to repeat the same assessment protocol in Phase I and Phase 3 reaches to document post-project channel and riparian conditions.

The RSRA protocol employs 23 total field indicators to rank the following five functional components of the stream-riparian system:

1. Water quality,
2. Stream channel and floodplain morphology,
3. Aquatic habitat,
4. Riparian vegetation structure and composition, including the occurrence and dominance of non-native species, and
5. Terrestrial wildlife habitat.

Within each category, between two and seven indicators are evaluated to reflect the functional condition of the stream ecosystem. Field counts allow assignment of scores to each variable, ranging from "1" (completely non-functional); to "5" (what would be expected in a system not impacted by human activities). The scores within each of the five functional categories are then averaged, to provide a category score, and the mean of all categories provides an overall condition score for the reach sampled. For the full RSRA methodology, please refer to the User's Guide available for download at http://wildutahproject.org/files/images/rsra_ug_2013v1_withcover_reduced.pdf.

AWP Project Manager Ann Oliver and volunteers conducted the Rapid Stream Riparian Assessment (RSRA) at the Phase 1 project site on October 1, 2013 and October 3, 2014. In both years, the 200 m transect portion of the protocol (Stacey et al. 2006) was begun approximately 20 m downstream of the airport infiltration gallery (at FLRS03) and stretched downstream approximately 200 m (Figure 5).

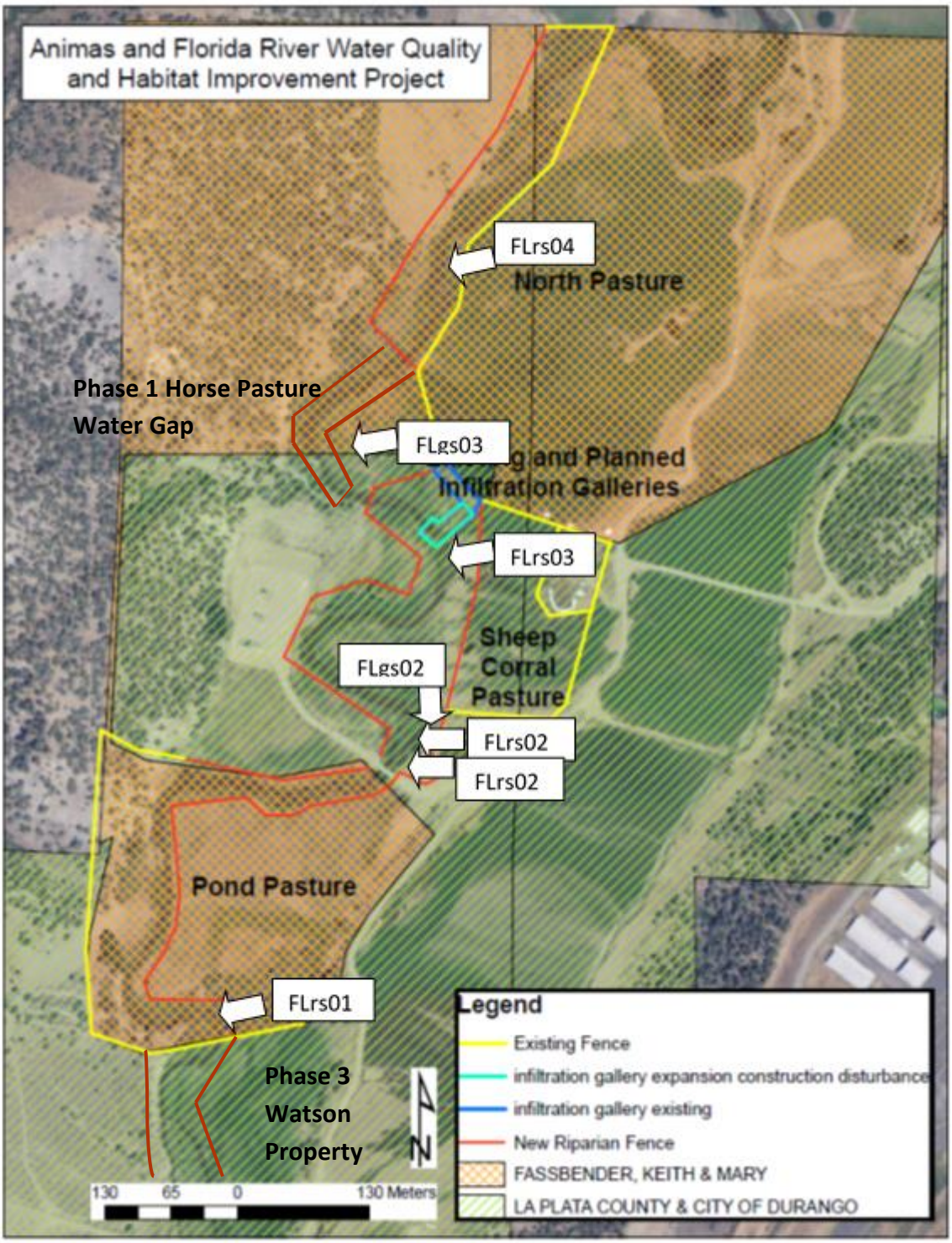

Figure 6. Map of Phase 2 showing Horse Pasture Water Gap and monitoring locations.

Results

The project partnered successfully with landowners Carolyn Watson and Keith Fassbender, and funding partners CO NPS and NRCS to install 10466.5 feet of 5 wire riparian fencing along both sides of approximately 1.2 miles of the Florida River. The fencing allows the landowner to manage livestock away from the river. The fencing encloses approximately 16.6 acres of riparian buffer. In addition, the project will work with volunteers to revegetate approximately 0.5 acres of that riparian buffer with willow cuttings where banks are eroding and unstable.

Figure 6 summarizes the pre-project results of RSRA monitoring conducted just upstream on the Phase I project site. Three indicators: algal cover, cobble embeddedness and aquatic macroinvertebrate diversity were assessed in 2013, but not in 2014 due to a lightning storm that cut short the monitoring visit. While the majority of the remaining 20 indicator scores did not differ between the two years, eight did. Of these eight, four were higher and four were lower. These differences may be attributable to variation in sampler estimates, differences in livestock management or wildlife use between the two years, and/or changes occurring due to high flows (e.g. a large storm in September 2014 may have deposited more large woody debris in the sampled reach).

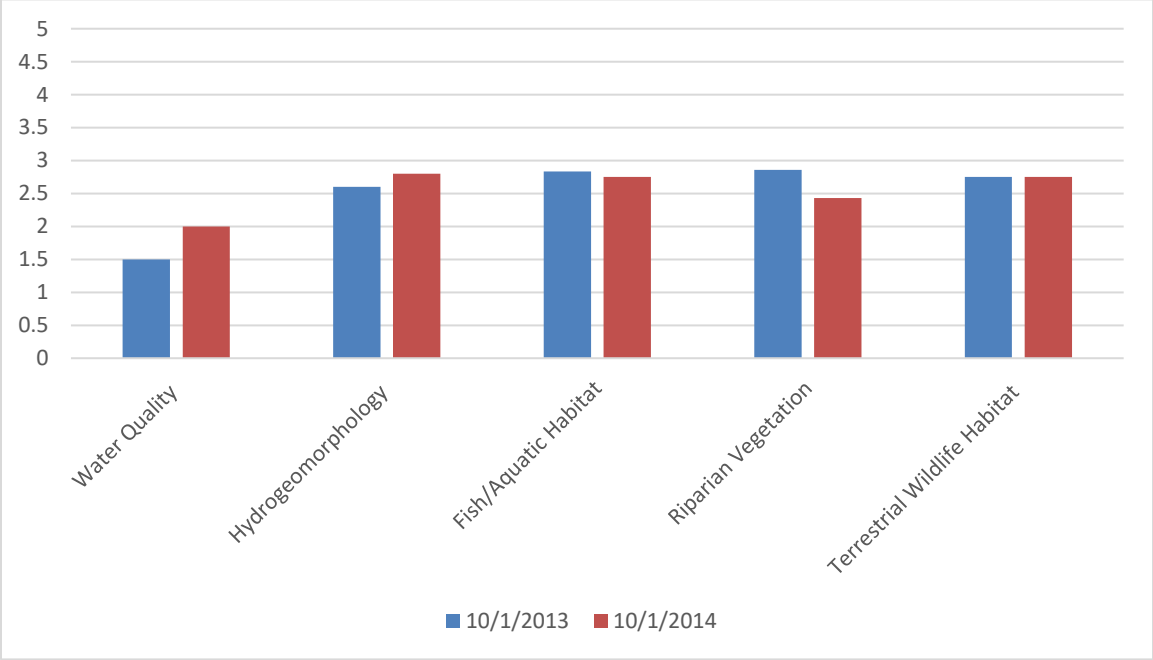

Figure 7. Rapid Stream Riparian Assessment mean pre-project scores for each functional category in 2013 and 2014.

Pre- and immediate post-project monitoring photos document pre-project and early post project conditions (Figures 7-10). Subsequent post-project re-photography and RSRA surveys by AWP will help assess the effectiveness of the fencing to create a riparian buffer and improve channel shading, aquatic and riparian habitat, and improve channel bank stability.

Figure 10. Phase 3 North End before (2016) and after (12/2016).

Figure 9. Phase 3 Upstream from bridge, before (2016) and after (6/2016).

Figure 8. Phase 3 Downstream from bridge, before (2016) and after (6/2016).

Figure 11. Phase 3 Downstream from corral, before (2016) and after (6/2016).

Conclusions and Discussion

The Florida River Habitat Improvement Project implemented Phase 3 of the larger Animas and Florida River Water Quality and Habitat Improvement Project aimed at implementing agricultural best management practices (BMPs) recommended in the Animas Watershed Based Plan (2011). As of this report, Phase 3 has fully met or partially met each of its 3 objectives. It has fully met the first and third objectives to protect river channel and riparian area by fencing approximately 1.2 miles of the Florida River to manage livestock away from the river, and to successfully complete the project within approved budget by March 1, 2017. The Project has partially met the objective to conduct monitoring to assess the effectiveness of fencing to create a riparian buffer and improve channel shading, aquatic and riparian habitat, and improve channel bank stability. This monitoring objective will be fully completed when AWP and MRP complete the final post project monitoring for the larger project, in 2017 and 2018.

The operation and maintenance (O&M) of the fencing implemented by this project are the responsibility of the partnering landowner, as specified in signed O&M agreement (Appendix 1). In order to ensure proper operation and maintenance of the fencing funded under this project, AWP conducts annual on-site evaluations with the landowner and lessee for 5 years. If any O&M problems are identified, AWP, the landowners and lessee will discuss and agree on the remedial steps to be taken by the landowner/lessee, as well as a timeframe for completion of these steps. These agreed upon steps will be described in a letter, to be followed by another on-site evaluation. Remedial steps will be paid for by the landowner. To date, all operation and maintenance reviews have found that the partner landowners are maintaining and operating the project fencing as agreed.

AWP recommends that future activity continue to focus on building relationships with landowners in the lower Florida River drainage. These relationships will be key to continuing to implement BMPs including irrigation improvements and riparian fencing.

AWP recommends that the geographic focus of BMP implementation to achieve improvements in riparian and aquatic habitat together with reductions in nutrient, sediment and bacterial

loading shift to Salt Creek, the last major tributary to the Florida River before it joins the Animas River. Our sampling efforts in 2014 and 2015 show that Salt Creek is a significant contributor of these pollutants to the Florida River. Based on this sampling and on our observations and experience, AWP would like to partner with NRCS, La Plata Conservation District Pine River Conservation District and the Southern Ute Tribe partner with landowners along Salt Creek and the Florida River downstream of Salt Creek to work on innovative approaches to developing and maintaining riparian buffers on these highly sinuous reaches.

The Florida Habitat Improvement Project Phase 3 should continue to benefit the Florida River through the project site and downstream, as well as both terrestrial and aquatic wildlife, by allowing native woody vegetation to reestablish along the rivers banks over time, providing increased bank stability and dense riparian habitat. With increased bank stability and shading should come improvements in the depth and shading of the stream, and help to decrease fine sedimentation, embeddedness and temperature.

Actual Expense Budget

TASK	DESCRIPTION	Actual Start Date	Actual Completion Date	CWCB CWRP Funds	CO NPS (Cash)	Reclamation CWMP (Cash)	NRCS (Cash)	Fence Contractor (In-Kind)	AWP (In-kind)	Volunteer Labor Willow Planting (In-Kind)	Landowner (In-Kind)	Total Project
1	Fencing and willow planting	2-May-16	13-Dec-16	$ 29,080	$ 13,987	$ -	$ 5,247	$ 13,203	$ -	$ 1,000	$ 500	$ 63,017
2	Monitoring	2-May-16	13-Dec-16	$ -	$ -	$ -	$ -	$ -	$ 390	$ -	$ -	$ 390
3	Project Management and Fiscal Administration	2-May-16	28-Feb-17	$ 3,420	$ -	$ 1,300	$ -	$ -	$ 450	$ -	$ -	$ 5,170
	Total			**$ 32,500**	**$ 13,987**	**$ 1,300**	**$ 5,247**	**$ 13,203**	**$ 840**	**$ 1,000**	**$ 500**	**$ 68,577**

References

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Appendix 1

Operation and Maintenance Agreement for Management Practices Funded and Installed by the Animas and Florida River Water Quality and Habitat Improvement Project

Agreement made *March 23, 2016* between *Animas Watershed Partnership of 100 Jenkins Ranch Rd, Space E-2, Durango, 81301 (hereinafter "AWP")*, and Carolyn Watson of 778 Salt Creek Road, Ignacio, CO 81137 (hereinafter "Landowner").

The Animas and Florida River Water Quality and Habitat Improvement Project (hereinafter "The Project") is a project funded by the Colorado Non-Point Source Program and the Colorado Water Conservation Board Watershed Restoration Program through grants to the AWP via their fiscal sponsor, the San Juan Resource Conservation and Development Council (hereinafter "SJRC&D"); and,

The Overall Goal of the project is to improve water quality and aquatic and riparian habitat in the Florida River by reducing nutrient loading and improving habitat in approximately 0.9 mile of this high priority tributary of the Animas River; and,

The Project aims to accomplish this goal by working with the landowner along the Florida River to install Best Management Practices (hereinafter, "BMPs") that can reduce nutrient loading from irrigated pasture and upland runoff along the Florida River. The BMP to be installed is 1) riparian fencing to create a densely vegetated riparian buffer adjacent to both banks of the Florida River on the Watson property.

THEREFORE, in consideration of the joint and mutual promises contained here, the parties state and agree as follows:

I.

Operation and Maintenance Agreement for Riparian Fencing

The operation and maintenance of the BMPs funded and installed under this project will be the responsibility of the landowner. In order to ensure proper operation and maintenance of the BMPs funded under this project, AWP will conduct annual on-site evaluations with the landowner for 5 years from December 2016 to December 2021.

II.

Installed Fencing and Livestock Management

Landowner agrees that the riverside areas protected by the fence constructed in 2016 with Colorado Non-Point Source and Colorado Water Conservation Board funds on property owned

by Landowner will not be used by Cattle, Horses, sheep or other domestic livestock for a period of 5 years, beginning December 1, 2016 and ending December 1, 2021.

III.
Problem Resolution

If any operation or maintenance problems are identified by AWP, then AWP and Landowner will discuss and agree on the remedial steps to be taken by Landowner, as well as a timeframe for completion of these steps. These agreed upon steps will be described in a letter, to be followed by another on-site evaluation. All remedial steps will be paid for by the Landowner.

IV.
Effect of Agreement

This agreement shall be applied to the benefit of and be binding on the heirs, legal representatives, assignees, and successors of the respective parties.

Agreed to and signed by

Carolyn Watson

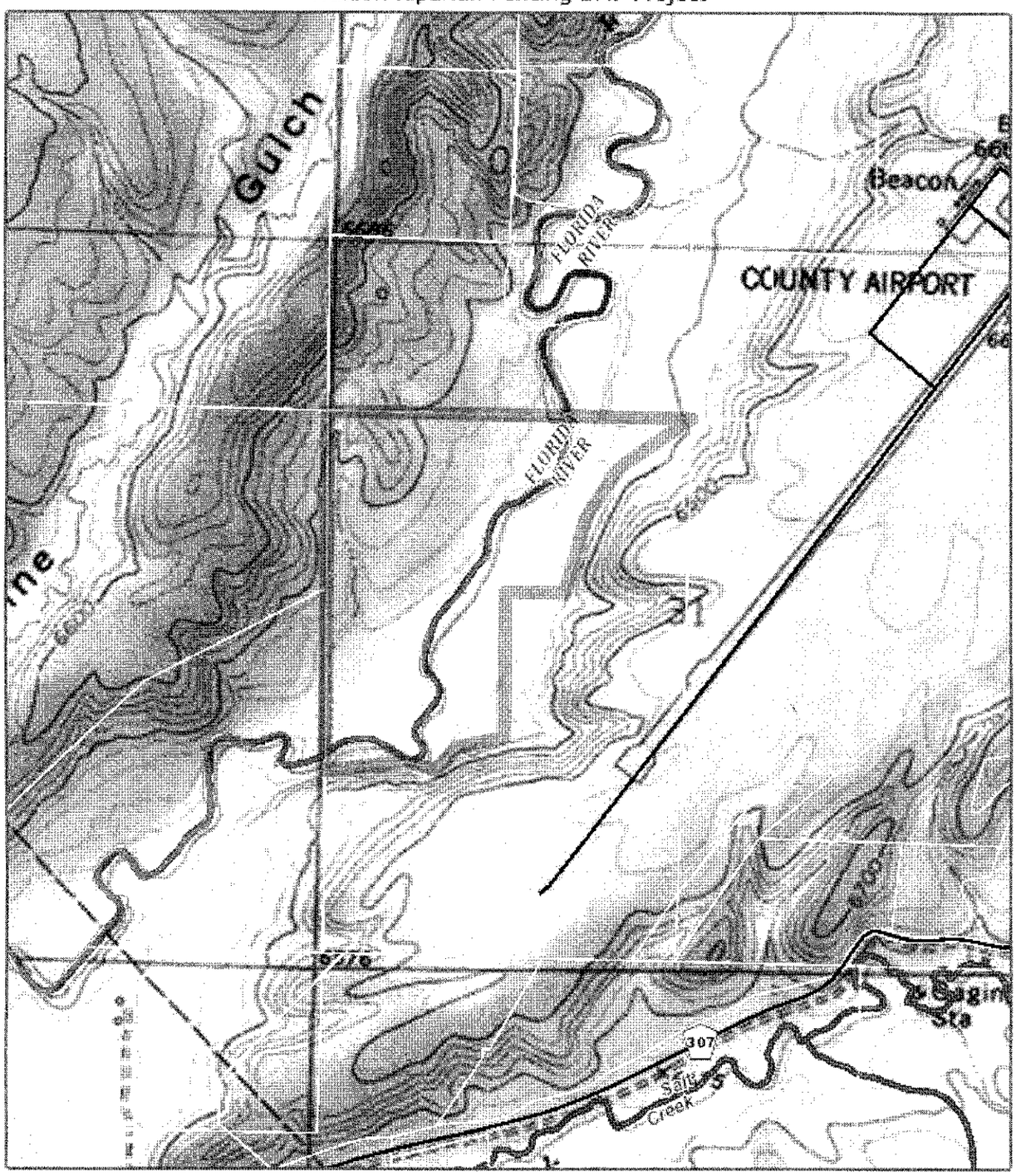
Carolyn Watson
(Landowner)

and

Paul A Montoia

Paul Montoia
Steering Committee Chairman
Animas Watershed Partnership

Watson Riparian Fencing BMP Project



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Map Scale
1 inch = 1065 feet
4/6/2016