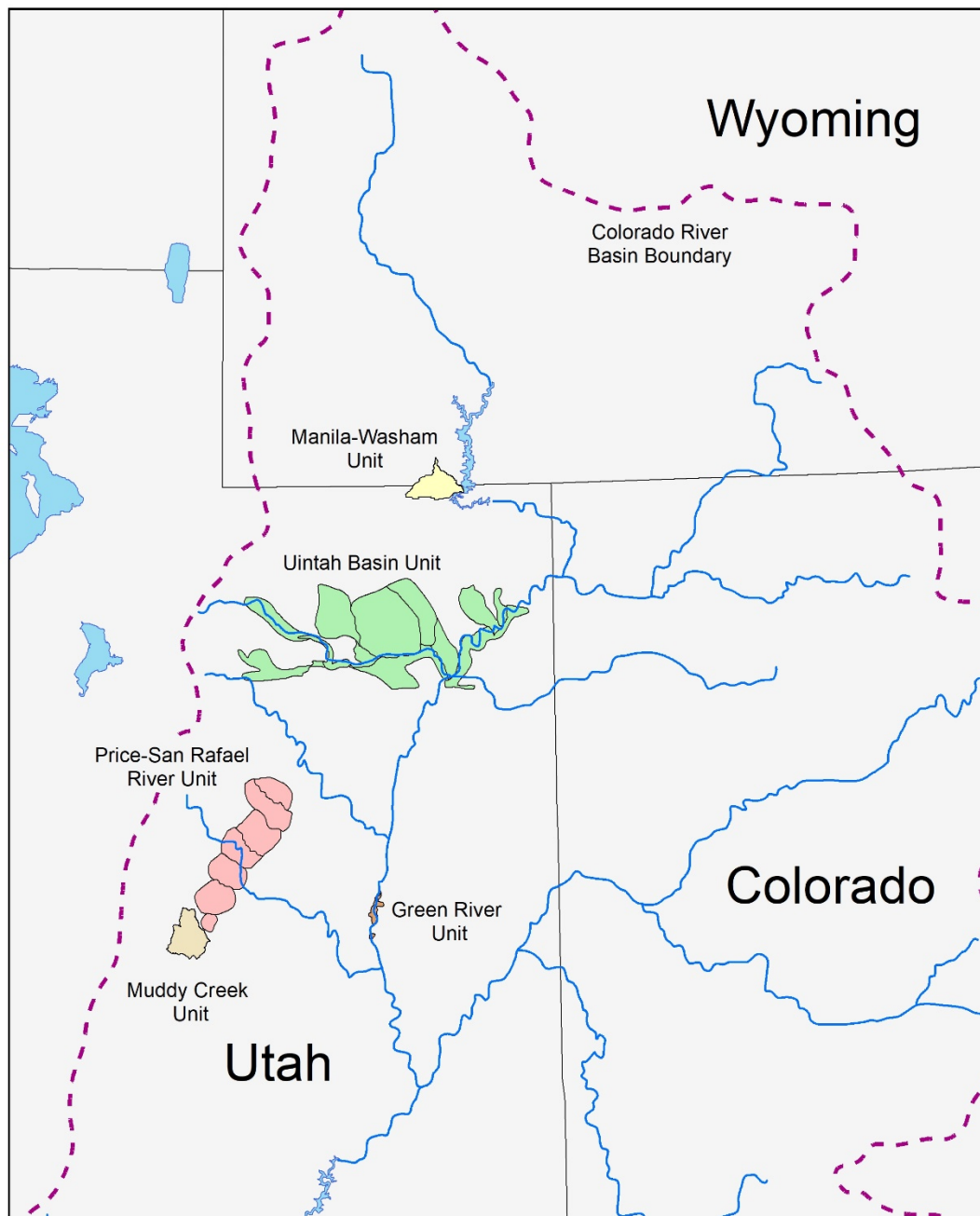


Colorado River Basin Salinity Control Program: Utah Units Monitoring and Evaluation Report, FY2017

USDA, Natural Resources Conservation Service



Utah Salinity Control Units Location Map

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Salinity Control Project Overview

It is estimated that in the 1960's more than two-thirds of water taken from the Colorado River was used to irrigate agricultural lands. Excessive deep percolation from flood irrigation (a common irrigation practice in the west) dissolves salt from saline soils commonly found in the Upper Colorado River Basin. Highly saline groundwater eventually returns to the Colorado River increasing its salinity. Elevated salinity in the river results in significant damage to agricultural, municipal, and industrial users in the Lower Colorado River Basin.

The Colorado River Basin Salinity Control Act (SCA) of 1974 (PL-93-320) authorized federal funding of salinity control projects to manage salinity in the Colorado River. Salinity studies determined that irrigation system improvements that increase irrigation efficiencies (thus reducing deep percolation), both on-farm and off-farm, are the most economical salinity control. In Utah five Salinity Control Units were facilitated through the SCA and subsequent legislation authorizes the USDA Soil Conservation Service, now the Natural Resources Conservation Service (NRCS), to implement and manage salinity control throughout the Colorado River Basin. The Uintah Basin Unit was established in 1982, Price-San Rafael Rivers Unit in 1997, Manila-Washam Unit in 2007, Green River Unit in 2010 and Muddy Creek Unit in 2010. (Cover: Utah Salinity Control Units Location Map)

USDA/NRCS initiated a funding program to promote irrigation system improvements on the land to reduce deep percolation and subsequent salt loading in the Colorado River. The Colorado River Salinity Control Forum (CRSCF), through Basin States funding, has supported many special projects in the designated salinity units. In 2010 CRSCF recommended to the NRCS that irrigation improvement work should include Basin State Funding for small individual projects in areas of the Colorado River basin not included in the established Units. These projects became known as Out-of-Project Units-Tier 2 improvement projects and are funded based on their predicted salinity control savings in tons per year of salt reduction.

Achievement Summary

The Price-San Rafael Unit has reached its goal for acreage treated. Uintah Basin unit lacks 550 acres to reach its goal and should do so in FY2018 (Figure 1: Acres Treated, FY 2017).

Within the five established salinity control units in Utah a combined total of 211,960 acres of farmland have been goaled for treatment under the salinity control program. Of the acres goaled for treatment in Utah, approximately 205,050 acres (97% of the total acreage goaled) has been treated to date. Estimated cumulative on-farm salt removal has lagged behind acreage somewhat (Figure 2: Salt Savings, FY 2017).

Figure 1: Acres Treated, FY 2017

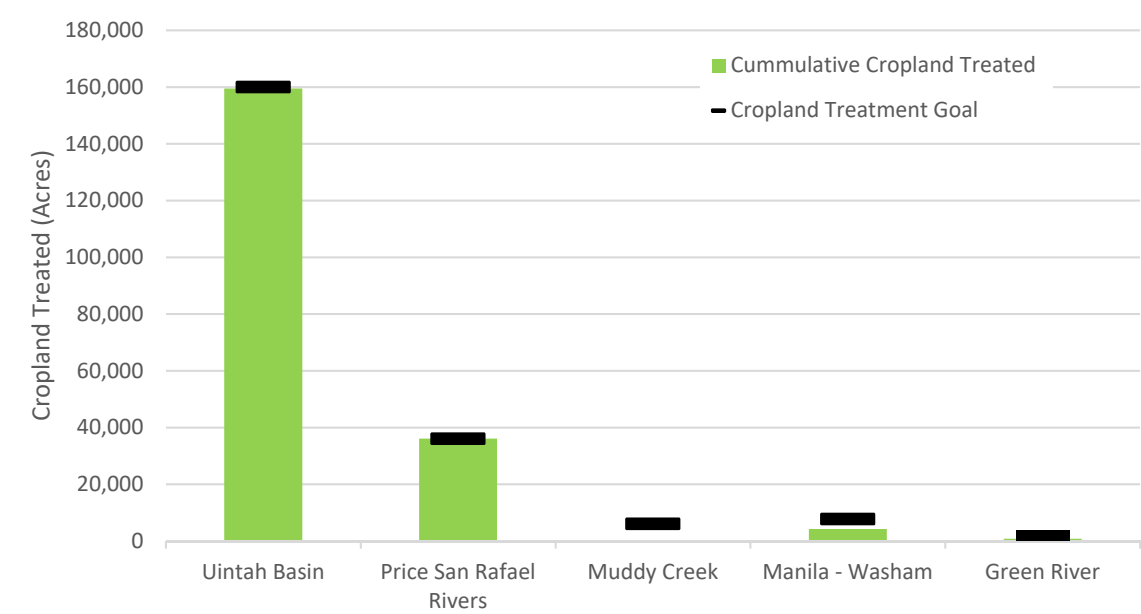
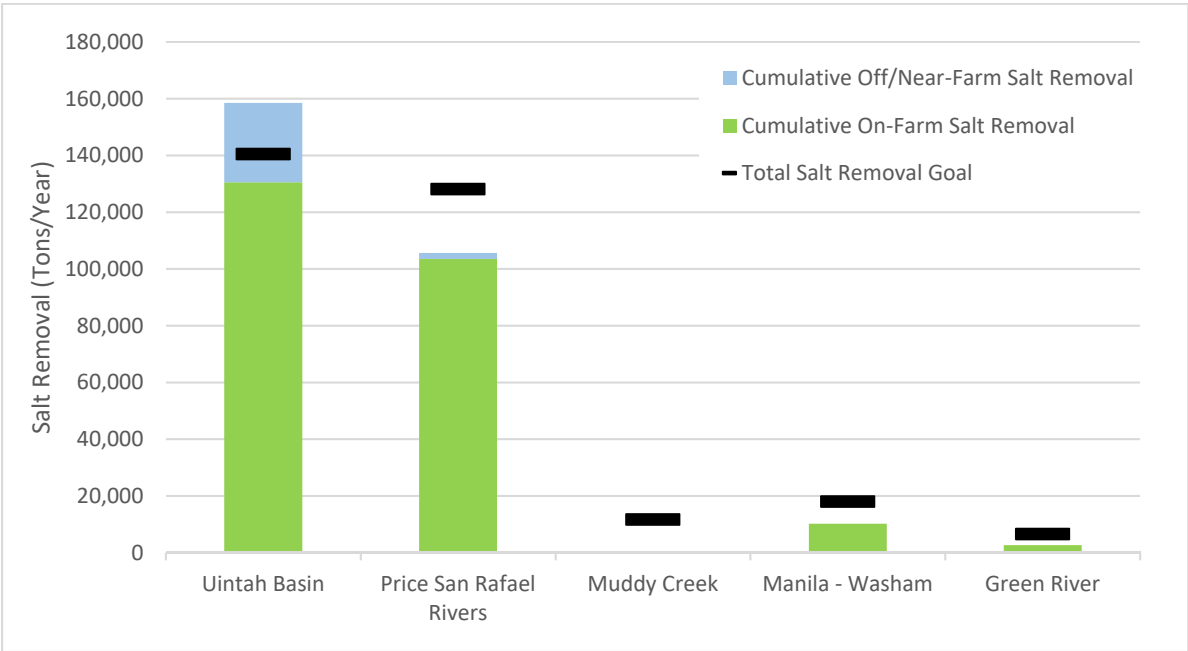


Figure 2: Salt Savings, FY 2017 (On-Farm and Off/Near-Farm)



Applications and Contracts

In FY2017 the NRCS received new applications to the salinity control program and obligated new contracts at rates in line with historic trends (See Table 1: Salinity Control Units Applications and Contracting, FY2017).

Table 1: Salinity Control Unit Applications and Contracting, FY2017

Project Unit	New Applications**	Contracts Obligated***	Contract Costs	Contract Acres
Green River	1	1	\$35,402	13
Green River Wildlife	0	0	\$0	0
Manila - Washam	3	2	\$25,990	15
Manila - Washam Wildlife	0	0	\$0	0
Muddy Creek	6	2	\$353,577	214
Muddy Creek Wildlife	0	0	\$0	0
Price - San Rafael Rivers	56	28	\$2,299,652	1,173
Price - San Rafael Wildlife	5	2	\$19,418	21
Uintah Basin	71	49	\$3,381,556	1,764
Uintah Basin Wildlife	2	2	\$36,745	216
Tier 2*	0	0	\$0	0
Total	141	85	\$ 6,130,368	3,220

* Projects outside of salinity units. Tier 2 Projects are not required to provide offsetting wildlife habitat.

** Applications received during the fiscal year

*** Contracts obligated under the EQIP program during the fiscal year

As described in the Muddy Creek unit section of this report new projects have been undertaken to pipe canals near Emery, UT and interest in on-farm improvements is considerable.

Off-farm canal improvements near Lapoint and Vernal, UT could also increase demand in the Uintah Basin unit on approximately 3,000 acres (see the Uintah Basin section of this report).

Wildlife Habitat Replacement

The Salinity Control Act amendment of 1984 (PL 98-569) requires voluntary replacement of incidental fish and wildlife values foregone resulting from irrigation improvements within project units. In 2012 the USFWS approved a policy change to allow replacement of wildlife habitat on a 1:1 acreage basis with a wildlife acreage target of 2% of acres treated with salinity controls. NRCS continues to promote wildlife habitat replacement and will continue to monitor and evaluate the extent and quality of wildlife habitat as resources allow. A case study to demonstrate the type of project NRCS is contracting is included in Appendix A. Annual and cumulative statistics for wildlife habitat are given below in Table 2: Salinity Wildlife Habitat Replacement.

Table 2: Salinity Wildlife Habitat Replacement

Project Unit	Habitat Replacement Goal*	Cumulative Habitat Applied	Current Status	Habitat Surplus/ (Deficit)	Habitat in Active Contracts
	Acres	Acres	%	Acres	Acres
Green River	16	0	0%	(16)	0
Manila - Washam	85	10	12%	(75)	0
Muddy Creek	7	0**	0%	(7)	0
Price-San Rafael Rivers	722	3,431	475%	2,709	20
Uintah Basin	3,189	21,504	674%	18,315	63

* Habitat Replacement Goal = 2% of the cumulative acres already treated.

** Revised downward due to discovery of a recording error in previous years.

Economic Impacts

The regional economic impact of the salinity program has been studied and reported in previous monitoring and evaluation reports. The salinity program is assumed to impact the region much the same as it has in the past.

Utah Salinity Unit Progress Reports

Green River Unit

Background

The Green River Salinity Control Unit (GR) straddles the Green River and the county line between Emery and Grand Counties including 4,000 agricultural acres irrigated with water diverted from the Green River. This area is approximately 3 miles east to west and 16 miles north to south. Water diverted to irrigate cropland and pasture deep percolates through the Cretaceous marine deposits dissolving and transporting salts to the river system.

The Green River Unit was established by a 2009 Environmental Assessment (EA) with a Finding of No Significant Impact (FONSI). The first USDA projects were funded in FY 2010. Salt load reduction is achieved by improving irrigation efficiency and reducing deep percolation. The 2009 EA anticipated treating 2,080 acres, controlling 6,540 tons/year of salt at a cost of \$115/ton.

Current Year

During FY 2017 NRCS treated 419 acres, controlling 1,356 tons of salt annually at a cost of \$27/ton. Cumulative through FY 2017 NRCS has treated 819 acres (39% of the project goal), controlling 2,644 tons of salt annually on-farm at a cost of \$26/ton (2017 dollars).

In FY 2017 no wildlife habitat replacement has taken place in the Green River Unit. Total habitat replacement through FY 2017 is 0 acres of 16 acres required to be concurrent and proportional.

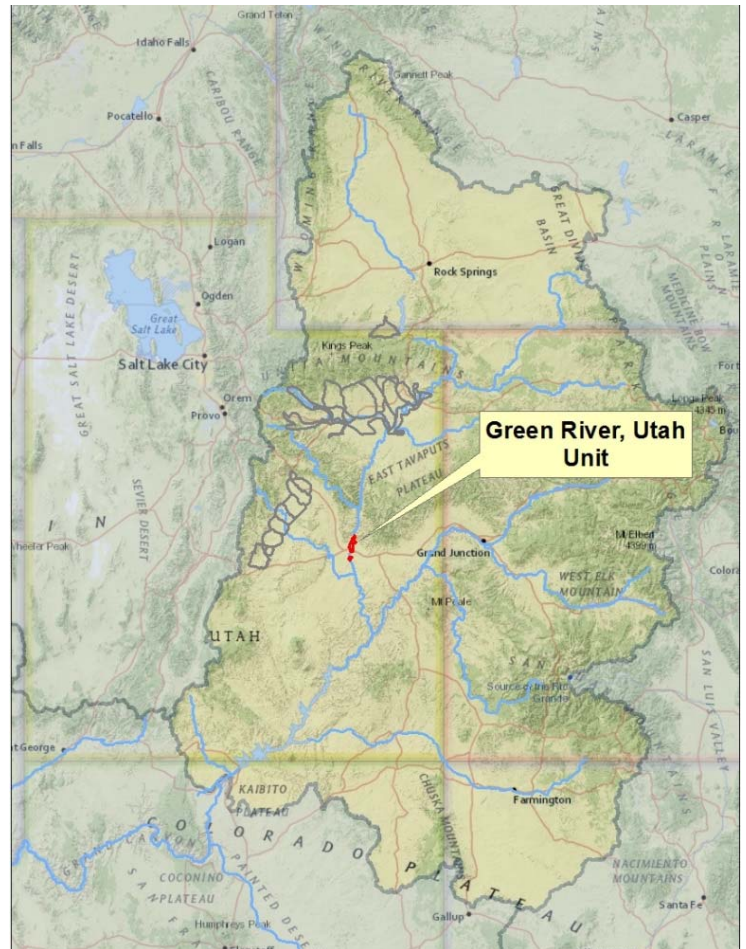


Figure 3: Green River Unit Location Map

Manila – Washam Unit

Background

The Manila-Washam Salinity Control Unit (MW) located on the north slope of the Uinta Mountains, encompasses 11,100 agricultural acres irrigated with water diverted from tributaries to Flaming Gorge Reservoir in Daggett County, Utah. The irrigated portion of the area is approximately 20 miles east to west and 8 miles north to south. Water diverted to irrigate cropland and pasture deep percolates through Tertiary Lacustrine deposits in the south and Cretaceous marine Mancos Shale deposits in the north dissolving and transporting salts to the river system.

Manila-Washam was established by a 2006 Environmental Assessment (EA) with a Finding of No Significant Impact (FONSI). NRCS first funded salinity control projects in FY 2007. Salt load reduction is achieved by improving irrigation efficiency and reducing deep percolation. The 2006 EA anticipated treating 7,780 acres, controlling 18,000 tons of salt annually at a cost of \$98/ton.

Current Year

During FY 2017 NRCS treated 189 acres, controlling 444 tons of salt annually at a cost of \$73/ton. Through FY 2017, NRCS has treated 4,265 acres (55% of the project goal), controlling 10,171 tons of salt annually on-farm at a cost of \$67/ton (2017 dollars). Approximately 3,515 acres (45% of the project goal) remains to be treated.

In FY 2017 no salinity related wildlife habitat replacement took place in Manila-Washam Unit. Total habitat replacement through FY 2017 is 10 acres of 85 acres required to be concurrent and proportional.



Figure 4: Manila-Washam Unit Location Map

Muddy Creek Unit

Background

The Muddy Creek Salinity Control Unit (MC) located in the southern portion of Emery County, Utah, includes 6,050 agricultural acres irrigated with water diverted from Muddy Creek and its tributaries. The Unit is approximately 13 miles east to west and 17 miles north to south. Water diverted to irrigate cropland and pasture deep percolates through Cretaceous marine deposits dissolving and transporting salts to the river system.

Muddy Creek Unit was established by a 2004 Environmental Assessment (EA) with a Finding of No Significant Impact (FONSI). The first NRCS projects were funded in FY 2010. Salt load reduction is achieved by improving irrigation efficiency and reducing deep percolation. The 2004 EA anticipated treating 6,050 acres, controlling 11,677 tons of salt annually at a cost of \$153/ton.

Current Year

During FY 2017 NRCS treated 258 acres, controlling 329 tons of salt annually at a cost of \$233/ton. Through FY 2017, NRCS has treated 329 acres (5% of the project goal), controlling 372 tons of salt annually on-farm at a cost of \$199/ton (2017 dollars). Approximately 5,721 acres (95% of the project goal) remains to be treated.

Canals within the Unit are currently being piped as of the writing of this report and some 60 applications have been received by NRCS for irrigation projects to be contracted in FY2018.

In FY 2017 no wildlife habitat replacement has taken place in the Muddy Creek Unit. Total habitat replacement through FY 2017 is 0 acres of 7 acres required to be concurrent and proportional. Habitat acres treated was misreported in the FY2016 M&E report.

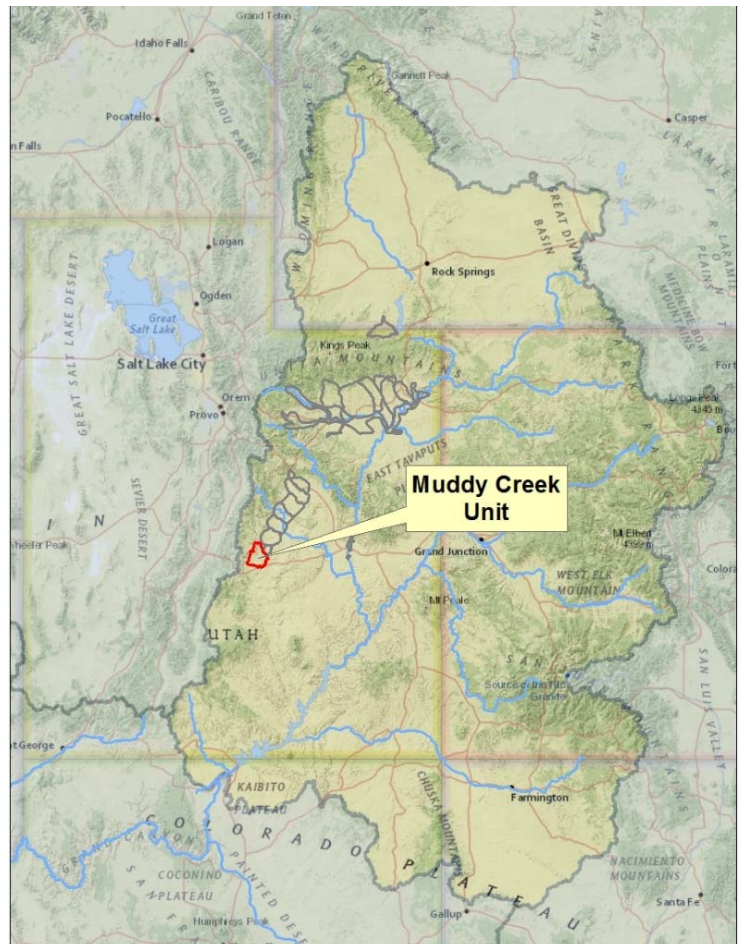


Figure 5: Muddy Creek Unit Location Map

Price-San Rafael Rivers Unit

Background

The Price San Rafael Rivers Unit (PSR) is located in east central Utah and encompasses 66,450 agricultural acres of irrigated land. Water is diverted for irrigation from tributaries of the Price and San Rafael Rivers in Carbon and Emery Counties. Irrigation water diverted to grow crops deep percolates through the surface soil originating from Cretaceous marine Mancos Shale deposits dissolving and transporting salts back into the river system.

In 1993 an Environmental Impact Statement (EIS) prepared jointly by U.S. Bureau of Reclamation (USBR) and Soil Conservation Service (now NRCS), established the PSR Salinity Control Unit. The first salinity control projects in the PSR were funded in FY1996. Salt load reduction is achieved by improving irrigation efficiency to reduce deep percolation in saline soils. The 1993 EIS anticipated treating 36,050 acres, controlling 146,900 tons of salt annually on-farm salt at a cost of \$65/ton.

Current Year

During FY 2017 NRCS treated 923 acres, controlling 2,593 tons of salt annually at a cost of \$69/ton. Through FY 2017 NRCS has treated 36,099 acres, controlling 105,991 tons of salt annually on-farm at a cost of \$54/ton (2017 dollars). The PSR is goaled to treat 36,050 acres. This Unit has reached its acreage goal, but NRCS will continue supporting salinity control in this unit.

In FY 2017 10 acres of wildlife habitat replacement has taken place in the Price San Rafael Unit. Total habitat replacement through FY 2017 is 3,421 acres of 722 acres required to be concurrent and proportional.

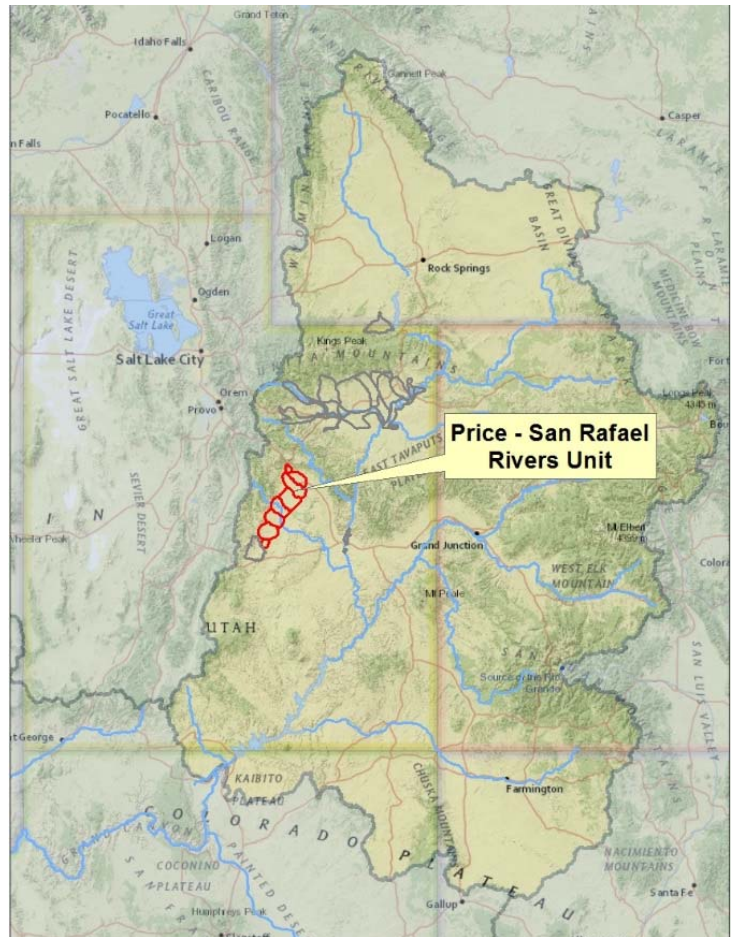


Figure 6: Price-San Rafael Rivers Unit Location Map

Uintah Basin Unit

Background

The Uintah Basin Salinity Control Unit (UB) located in northeastern Utah, encompasses 225,000 irrigated agricultural acres irrigated with water diverted from tributaries of the Duchesne and Green Rivers south of the Uinta Mountains and north of Ouray, Utah. Water diverted to irrigate cropland and pasture deep percolates through Tertiary saline lacustrine deposits transporting dissolved salts to the river system.

The 1974 SCA named four specific salinity control projects (Paradox Valley Unit, Grand Valley Unit, Crystal Geyser Unit, Las Vegas Wash Unit) which directed expedited planning reports for irrigation source control in Uinta Basin (UB), Lower Gunnison, Colorado River Indian Reservation, and Palo Alto Irrigation District. After multiple studies, UB was established by a 1982 environmental impact statement, although USDA funding of salinity control projects started in 1980 using grant programs already in place. Salt load reduction is achieved by improving irrigation efficiency and reducing deep percolation. The 1982 EIS anticipated treating 122,200 acres, controlling 76,600 tons of salt annually at a cost of \$197/ton (2014 dollars). Initial success of the program resulted in the preferred treatment shifting from improved flood to more efficient sprinkler systems. The EIS was amended in 1991 increasing the UB treatment goal to 160,000 acres (70% of 225,000 irrigated acres in the unit).

Current Year

During FY 2017 NRCS treated 728 acres, controlling 671 tons of salt annually at a cost of \$206/ton. Through FY 2017 NRCS has treated 159,454 acres, controlling 157,474 tons of salt annually on-farm at a cost of \$147/ton (2017 dollars). Of the original 160,000 acres to be treated 546 acres (about 0.3% of the original project goal) remain to be treated.

The Whiterocks-Mosby, Ashley Upper-Highline, and Rockpoint canal systems are currently being piped and will likely result in additional demand for on-farm improvements on 3,000 acres.

In FY 2017 29 acres of wildlife habitat replacement was completed in the Uintah Basin Unit. Total habitat replacement through FY 2017 is 21,504 acres of 3,189 acres required to be concurrent and proportional.

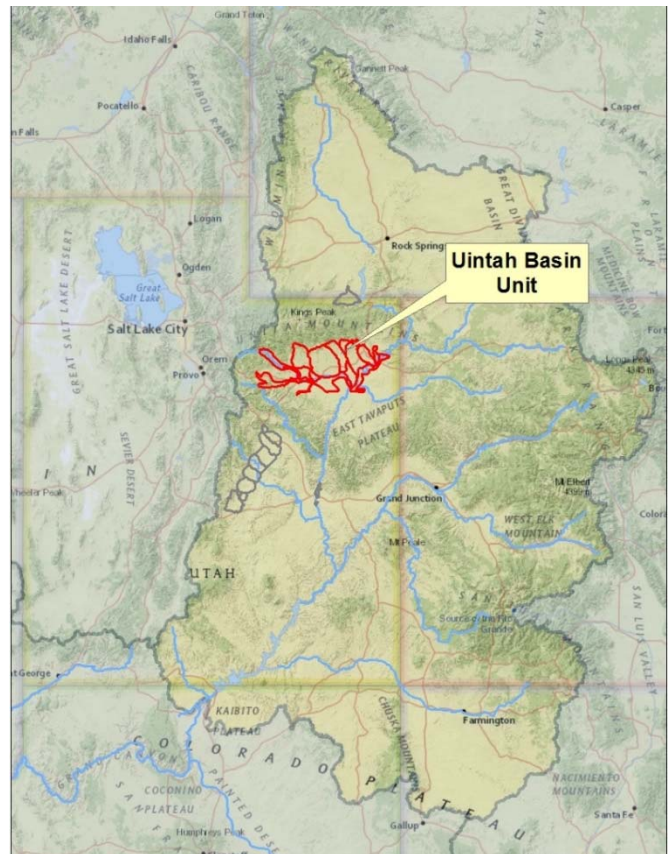


Figure 7: Uintah Basin Unit Location Map

Contact Information

This report is limited in scope. For additional information on the Colorado River Salinity Control Program visit:

Natural Resources Conservation Service web site:

www.nrcs.usda.gov/wps/portal/nrcs/detail/ut/programs/financial/eqip/

Bureau Reclamation web site: www.usbr.gov/uc/progact/salinity/

Colorado River Salinity Control Forum web site: <http://coloradoriversalinity.org/>

For additional Monitoring and Evaluation reports search the internet under “USDA Monitoring & Evaluation Reports for Salinity Projects”.

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Utah NRCS offices within the Salinity Area are located in the following communities: Roosevelt, Vernal, Price, and Castle Dale, UT.

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Appendix A

Wildlife Case Study

Background

This project is located on 11.5 acres adjacent to an existing wooded intermittent stream drainage (Figure A1) in the Uintah Basin. The project improves upland habitat and primarily benefits deer and pollinators and qualified for funding with a WHEG Score Improvement of 0.13. The associated agricultural use of the land is pasture. Invasive species will not be fully controlled by this project, although the project should help to limit their spread. The owner has participated in the salinity wildlife program on projects in the past (see Figure A2) and has a good track record with NRCS for operation and maintenance of his projects.

Since the stream is intermittent there is no need for fencing to restrict cattle from accessing the site. The fencing included in the project is intended to protect the trees from wildlife grazing until the trees are established.

Given the harsh soils and water requirements the plantings will require ongoing watering and maintenance until they become established. Harsh soils in this location also require use of potted trees to ensure root survival. Previous plantings in the vicinity of this project have established themselves with adequate support (Figure A3).

Results

The following practices were included in the Wildlife Habitat Conservation Plan.

Irrigation Pipeline	3,164	ft
Microirrigation	11.5	ac
Tree/Shrub Establishment	156	each
Mulch, Weed barrier, etc	1,800	sqft
Fence	1,404	ft

Currently NRCS practices do not make additional payments for potted plants. Thus, the owner must bear the additional costs incurred for potted plantings. The project was contracted and completed in FY2017. NRCS projects are certified only if the planned practices have been installed as specified. If the project is maintained properly the value increase associated with the WHEG score will be achieved.



Figure A1: Planting locations



Figure A2: Prior successful plantings adjacent to the project area implemented without NRCS assistance



Figure A3: New tree plantings