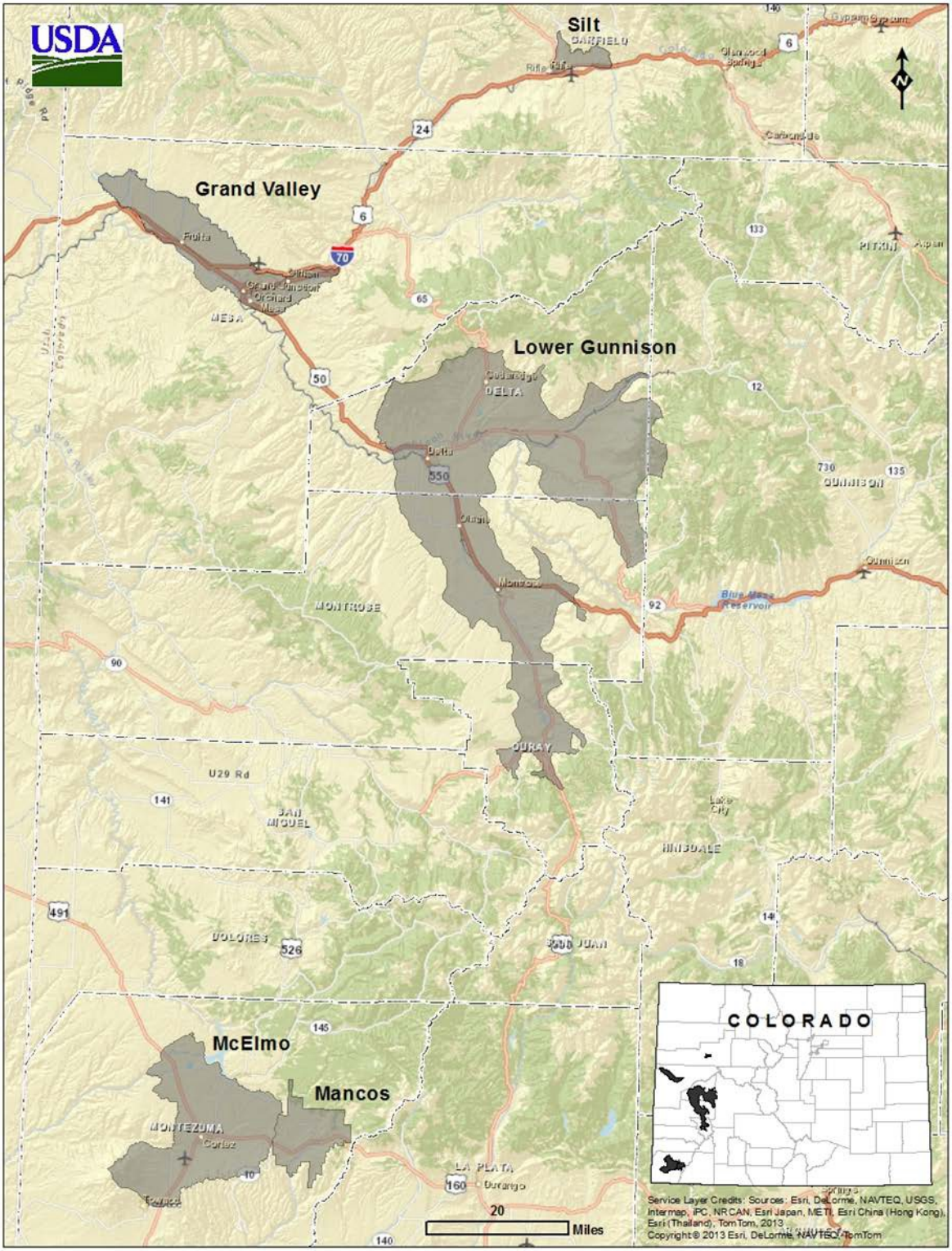
Colorado River Salinity Control Program, State of Colorado
Salinity Control Unit Summary, FY 2017



Colorado River Salinity Control Program Overview

The Water Quality Act of 1965 (Public Law 89-234), as amended by the Federal Water Pollution Control Act of 1972, mandated efforts to maintain water quality standards in the United States. Congress enacted the Colorado River Basin Salinity Control Act (PL 93-320) in June 1974. Title I of the Act addresses the United States' commitment to Mexico and provided means for the U.S. to comply with provisions of Minute 242. Title II of the Act created a water quality program for salinity control in the United States. Primary responsibility was assigned to the Secretary of Interior and the US Bureau of Reclamation (USBR). USDA was instructed to support USBR's program with its existing authorities.

The USDA-Natural Resources Conservation Service (NRCS), formerly USDA-Soil Conservation Service (SCS), both herein referenced as NRCS, initiated a program to make a variety of irrigation improvements to reduce deep percolation and on-farm ditch seepage to reduce the salt load potential to the Colorado River. Salinity control projects were initiated in Colorado starting with Grand Valley Unit in 1979, Lower Gunnison Unit in 1988, McElmo Creek Unit in 1989, Mancos Valley in 2004, and Silt in 2005. The NRCS irrigation improvement work included piping or lining irrigation ditches and small laterals, and improving the on-farm irrigation systems. In 2010 the Salinity Control Forum recommended the NRCS approve designated salinity control funding for small individual projects in catchments within the Colorado River Basin, but outside of the designated salinity control units to utilize salinity funds not used in the designated units. The Out-of-Project Area Tier 2 individual irrigation improvement projects are funded based on their predicted salinity control benefit calculated using USGS SPARROW water quality analysis.

The Salinity Control Act also requires that within designated project areas, all wildlife habitat values lost due to the irrigation improvements will be replaced concurrently and proportionally to the installation of the improved irrigation system acres. NRCS and the U.S. Fish and Wildlife Service have agreed on set habitat replacement acreage amounts for each designated project area, which is typically approximately two (2) percent of the irrigation improvement acres.

Achievement Summary

The Grand Valley Unit has reached its goal for aces treated. The remaining units are all above 52% of the acres treated goal and three of the remaining four basins are greater than 65% of the goal of tons of salt removed. (Table 1: Colorado Project Summary FY 2017)

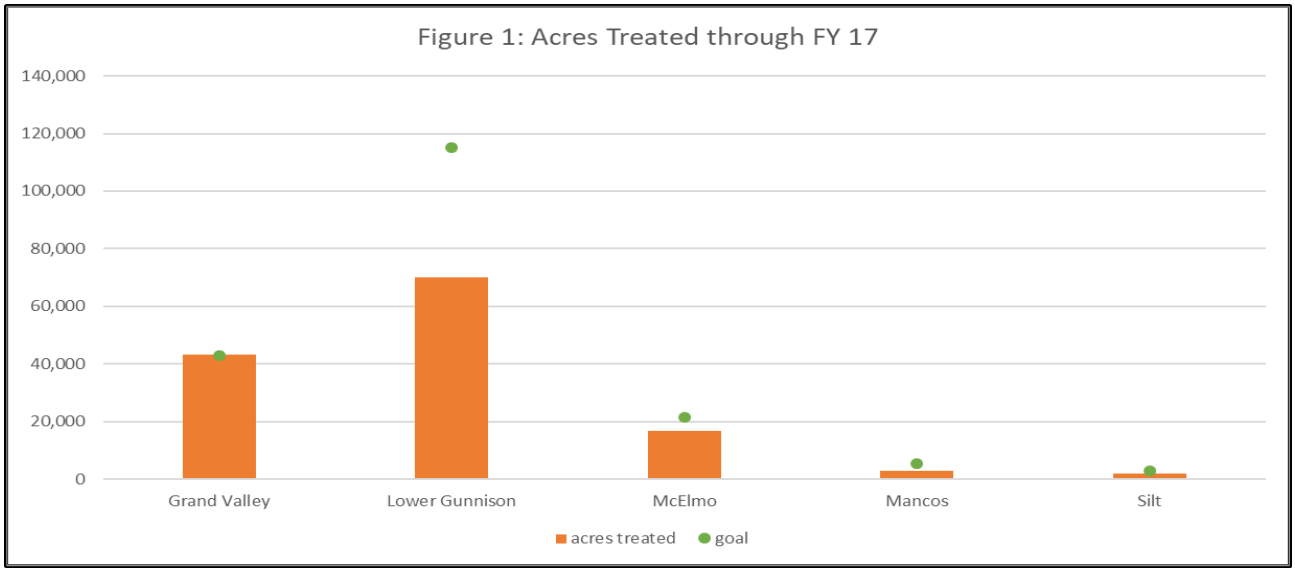
Overall with the Colorado Project area, more than 71% or 134,377 acres of cropland have been treated as we work towards the goal of 187550 acres treated. (Figure 1, Acres Treated, FY 2017). Our estimated salt removal is at 80% or 304,959 tons of the 379,930 tons goaled. (Figure 2, Salt Savings, FY 2017)

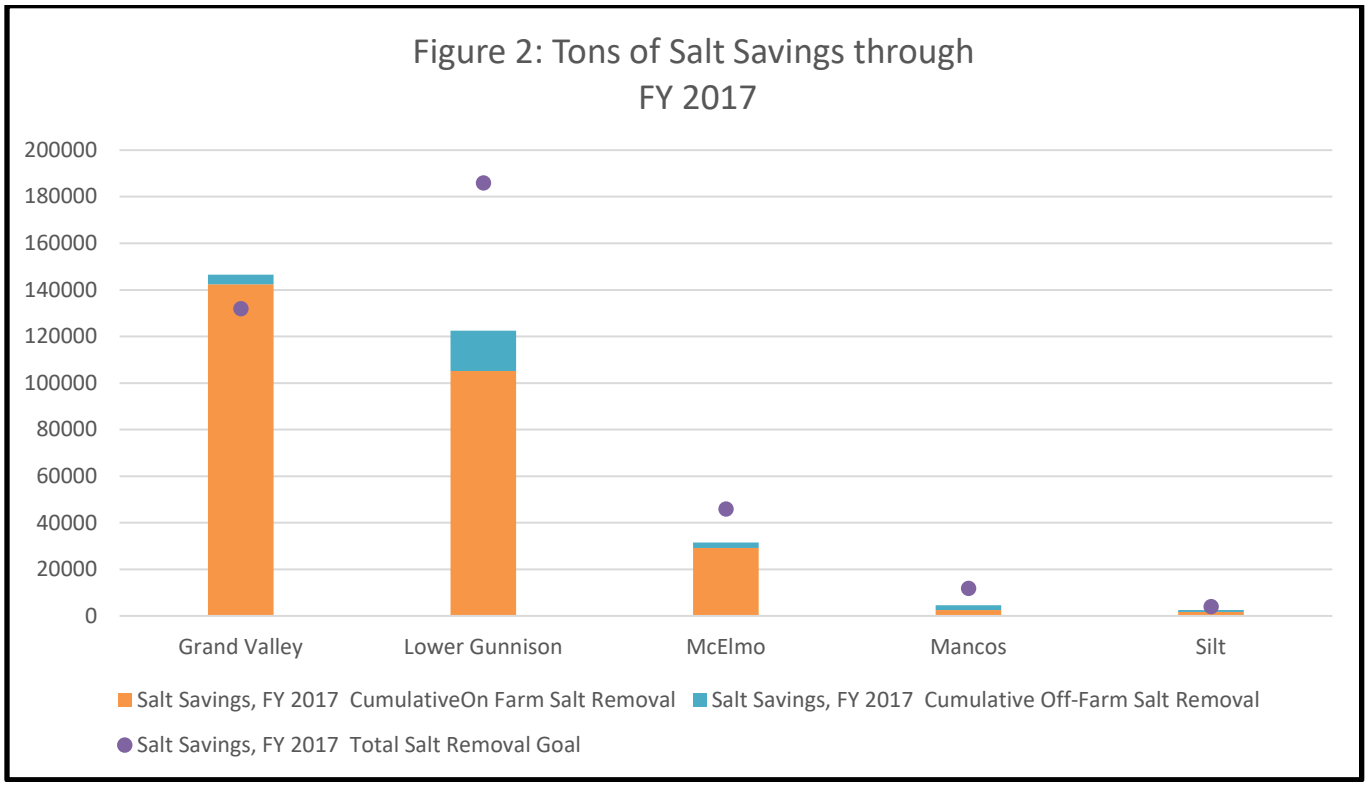
Note also, there is a wide variation in the amortized cost per ton that is based on a large part on the variation in salinity loading rates where each project is located. The predicted salinity loading rate within the designated salinity control units ranges from a high of 4.3 tons per year per acre in the Grand Valley Unit to a low of 1.0 tons per year per acre in the Mancos Valley and Silt Units. The lower salinity loading rate will result in a significantly higher amortized cost per ton for a similar level of improvement and net project cost.

Table 1: Colorado Project Summary FY 2017

Project Area	Project Starting Year	Goaled Treatment (Acres)	FY 2017 Treated (Acres)	FY 2017 Cumulative Cropland Treated (Acres)	Treated Acres Applied to Total Project Acre Treatment Goal (Percent)	Goaled Treatment (Tons)	FY 2017 (Tons)	FY 2017 Cumulative Treated (Tons)	Treated Tons Reported to Total Project Ton Treatment Goal (Percent)	FY 2017 Amortized CostPerTon
Grand Valley -Completed Project	1979	42,800	217	43,151	100%	132,000	217	143,823	109%	$113.99
Lower Gunnison	2005	115,000	1,482	69,942	61%	186,000	1,462	122,496	66%	$126.22
McElmo Creek	2004	21,550	543	16,702	78%	46,000	330	31,506	68%	$72.60
Mancos Valley	1989	5,400	25	2,798	52%	11,940	124	4,622	39%	$1103.84
Silt	1988	2,800	1	1,784	64%	3,990	186	2,512	63%	$248.97
Out-of-Project Area Tier 2	2010	na	34	3,679	na	na	46	4962	na	$164.31

[1/] The amortized cost per ton is calculated as the Total Federal Financial (FA) cost plus Technical Assistance (TA) cost times the annual amortization factor based on the annual percentage rate for each year. The Federal TA is based on the FA dollars times 0.67 for each project, and the amortization period is 25 years.





Wildlife Habitat Replacement

The Salinity Control Act requires voluntary replacement of wildlife habitat values foregone as a result of irrigation improvements within the designated project units. To be concurrent and proportional NRCS and U.S. Fish and Wildlife Service have agreed that wildlife habitat replacement shall be greater than 2% of the cumulative irrigation improvement acres for each project unit. NRCS continues to promote wildlife habitat replacement.

Colorado NRCS will continue to promote and work with landowners to promote wildlife habitat replacement. We have several contracts with wildlife practices scheduled in future years. However, due to a continued decrease in staffing, monitoring will be limited and only completed when resources are available.

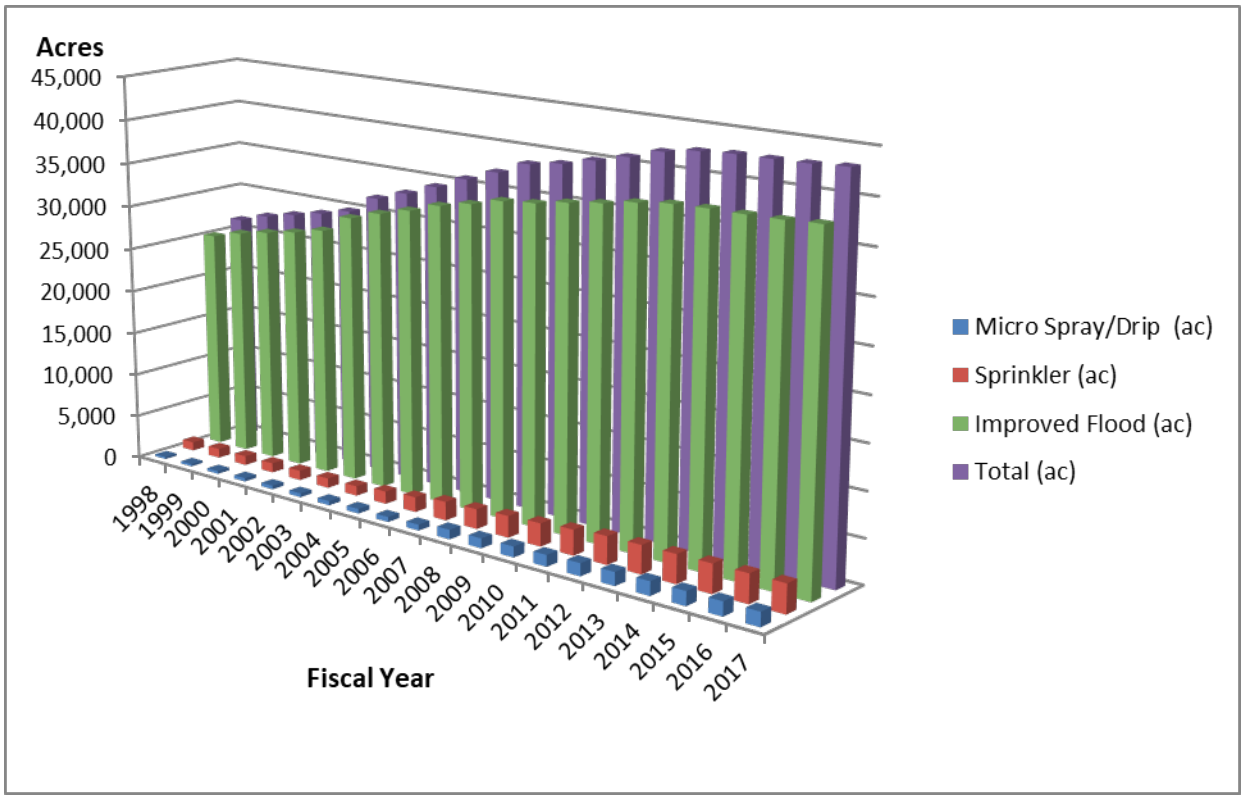
Economic Impacts

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.

Colorado Salinity Unit Progress Reports

The Grand Valley – Completed Project has achieved the irrigation treatment acreage goal, and exceeded the planned ton goal primarily due to additional higher efficiency levels of on farm irrigation system improvements and a much larger amount of near farm irrigation delivery system improvements than were anticipated when the original project plan was developed. The amortized cost per ton for the Grand Valley Unit often is typically higher due to the cost of these high efficiency precision application irrigation systems. The Grand Valley Unit has a current habitat replacement goal of 1,206 acres. There are currently 774 acres or suitable replacement habitat applied and maintained, however the unit has 454 acres of additional habitat under contract and being applied, and a large portion is on Colorado State Parks and Wildlife land. Since the on-farm irrigation improvement project is essentially complete, the project area should meet or exceed the total habitat replacement goal when all the current active habitat contracts are completed.

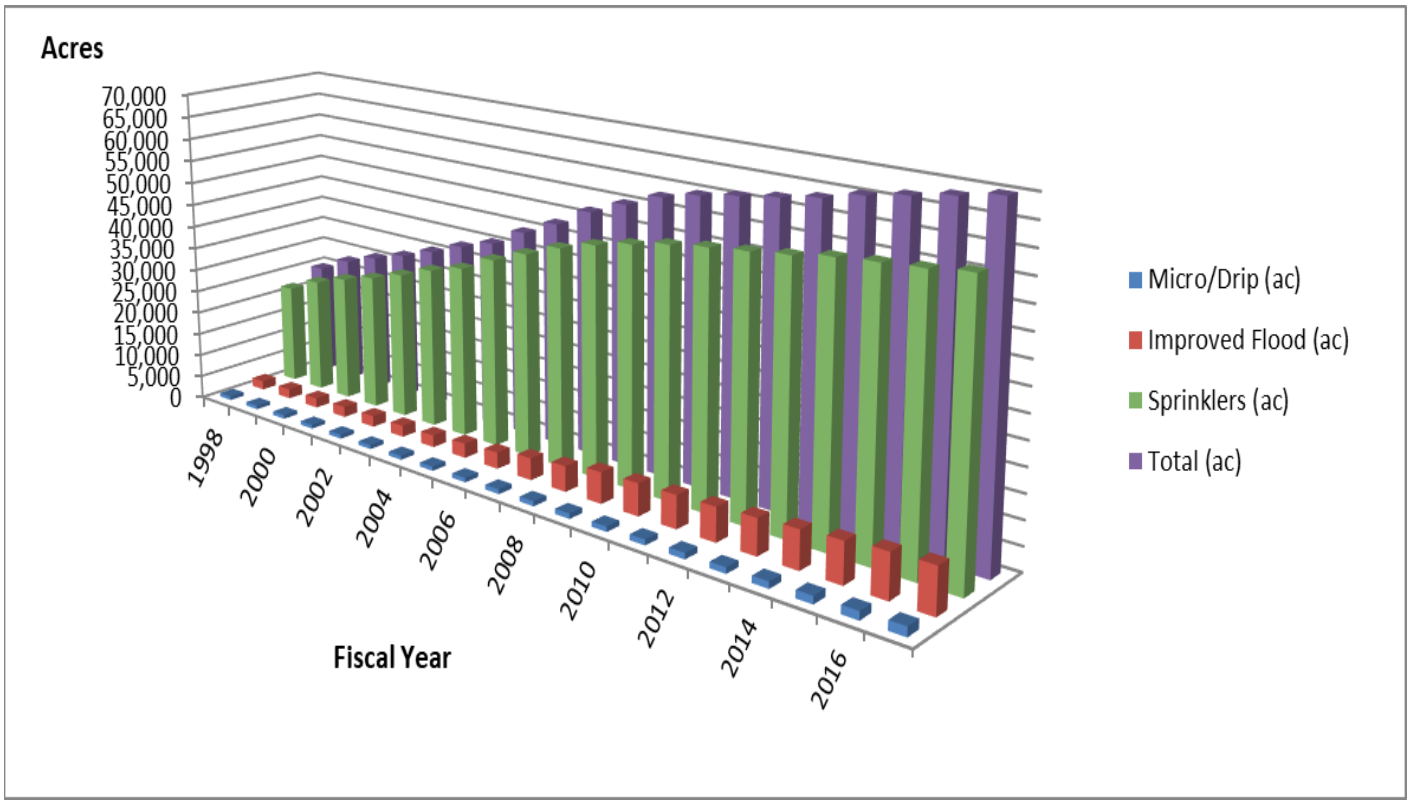
<u>Current Year</u>
During FY 2017, NRCS treated 217 acres, reducing 217 tons of salt annually at a cost of $113.99/ ton. Cumulative through FY 2017 NRCS has treated 43,151 acres (100% of the project goal), controlling 143,823 tons of salt annually on farm at a cost of $186.46 ton.



The Lower Gunnison Project has achieved 61 percent of the acreage treatment goal, and has achieved 66 percent of the ton reduction goal primarily due to a higher efficiency level of irrigation system improvement and additional treatment of near farm irrigation delivery systems treated as part of the NRCS on farm program. The original project goal was to treat 135,000 acres of irrigated cropland. However extensive urban, sub-urban, and small acreage residential development has occurred in the project area, reducing the predicted number of acres needing treatment and eligible for the NRCS farm oriented financial assistance programs, to the current level of 115,000 acres. Given the tons reported are tracking ahead of the acres treated, it is still expected the original 186,000 ton per year salinity reduction goals will be achieved even with the reduction in acres treated. The Lower Gunnison Unit wildlife habitat replacement acres applied and maintained is concurrent with the irrigated acres treated to date, and the unit has enough additional acres applied and in active contracts they should remain concurrent for the foreseeable future.

Current Year

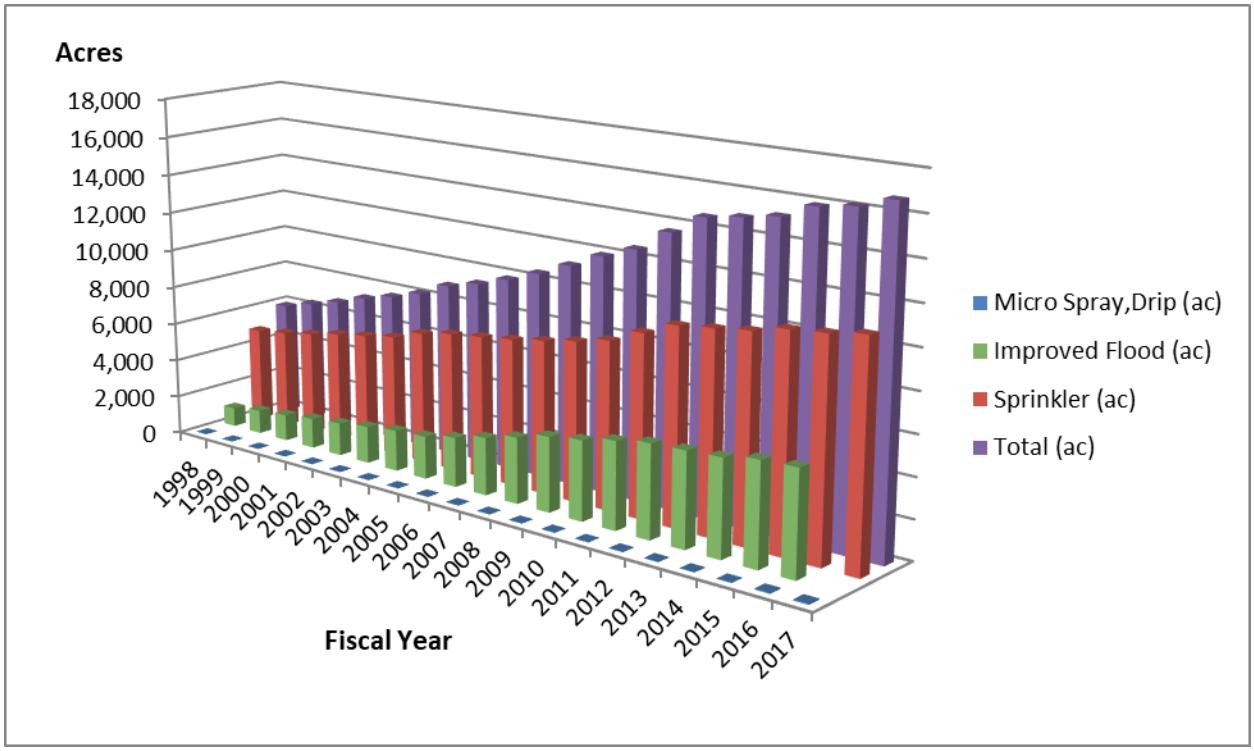
During FY 2017, NRCS treated 1,482 acres, reducing1,462 tons of salt annually at a cost of $126.22/ ton. Cumulative through FY 2017 NRCS has treated 69,942 acres (61% of the project goal), controlling 122,496 tons of salt annually on farm at a cost of $137.75/ ton.



The McElmo Creek Project has achieved 78 percent of the acreage treatment goal, and the project is at 68 percent of the salinity reduction goal due primarily to a higher percentage of the lower efficiency flood irrigation improvements, rather than the anticipated level of the higher efficiency sprinkler irrigation system improvements. The ratio of lower efficiency to higher efficiency systems is reducing the net level of salinity reduction achieved by the on-farm treatment. In addition, an adjustment to the predicted salinity loading reduction from each type of improvement was made to assure the unit could not over report the net salinity reduction benefits. The result of the adjustment in the salinity loading rate resulted in a smaller number of tons reported for each individual project. The unit is lagging in the concurrent habitat replacement due to the results of a field analysis to track the habitat projects applied, and to determine if the applied projects met suitable salinity replacement habitat. The data collected during the field review resulted in a reduction in the number of acres confirmed as applied and maintained from what was previously reported. Some of the smaller habitat projects had not been maintained and some of the earlier projects could not be tracked through the administrative record to determine if the project as applied and maintained, still met suitable replacement habitat requirements. The current acreage number reflects suitable wildlife habitat replacement projects that are still in place, being maintained, and can be tracked. Additional analysis may still confirm other previously reported habitat acres are being maintained as suitable salinity habitat replacement projects.

Current Year

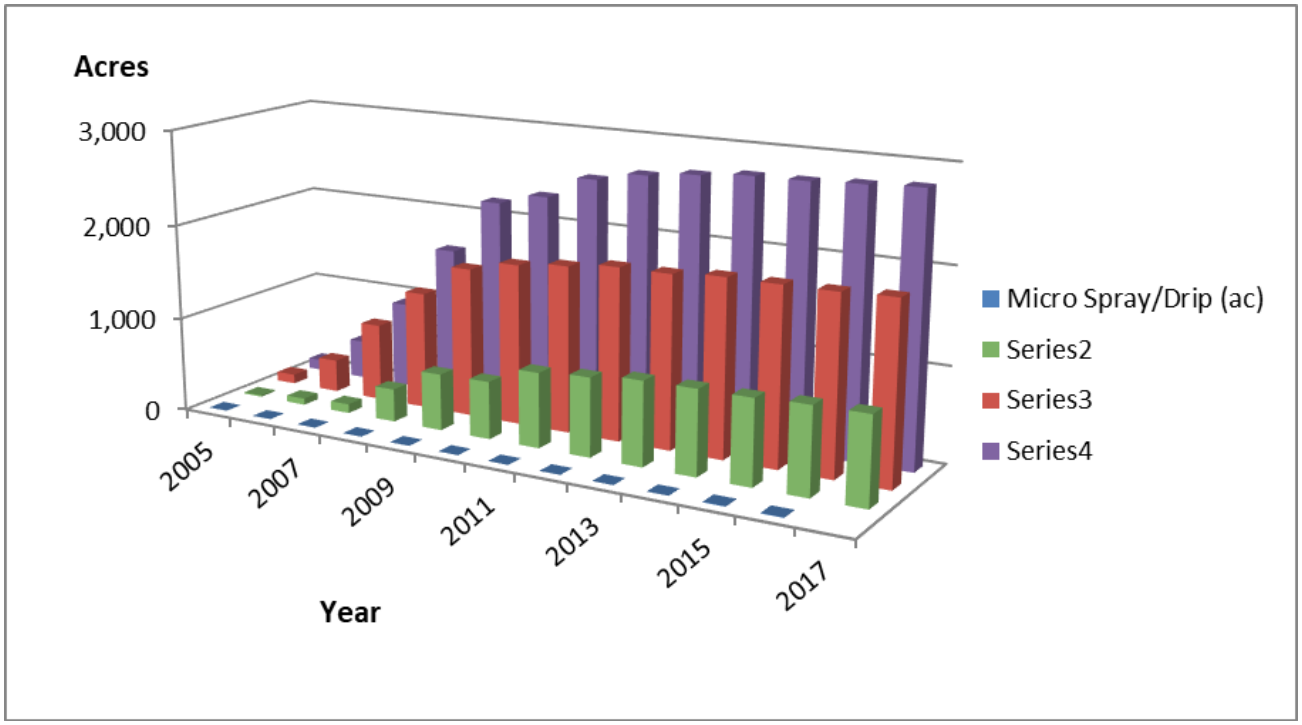
During FY 2017, NRCS treated 543 acres, reducing 330 tons of salt annually at a cost of $72.60/ ton. Cumulative through FY 2017 NRCS has treated 13,702 acres (78% of the project goal), controlling 31,506 tons of salt annually on farm at a cost of $157.00/ ton.



The Mancos Valley Project is at 52 percent of the acreage treatment goal, but is at 39 percent of the salinity ton reduction goal due primarily to a lower amount of off farm irrigation delivery treatments reported than was originally anticipated. Several of the irrigation delivery systems in the area have applied for financial assistance through various USDI, USDA, and other funding assistance programs however they have not competed successfully for the limited funds due to the relatively lower salinity loading rate in this small project area. With the limited amount of irrigation delivery improvement funding, both the off farm and near farm irrigation delivery salinity reporting is lagging net project goals, and the lack of successful funding applications for irrigation delivery system improvements will likely continue to affect the number of on farm applications. If additional funding for the off-farm delivery is not available, it is unlikely the unit will reach full implementation goals in the foreseeable future. The project exceeds the concurrent habitat replacements goals significantly, and most likely will have enough salinity replacement habitat projects in place to meet full project implementation goals if all the acres are eventually treated. The proximity of this project to the McELmo Creek unit could provide additional replacement habitat values for both areas in the future if needed.

Current Year

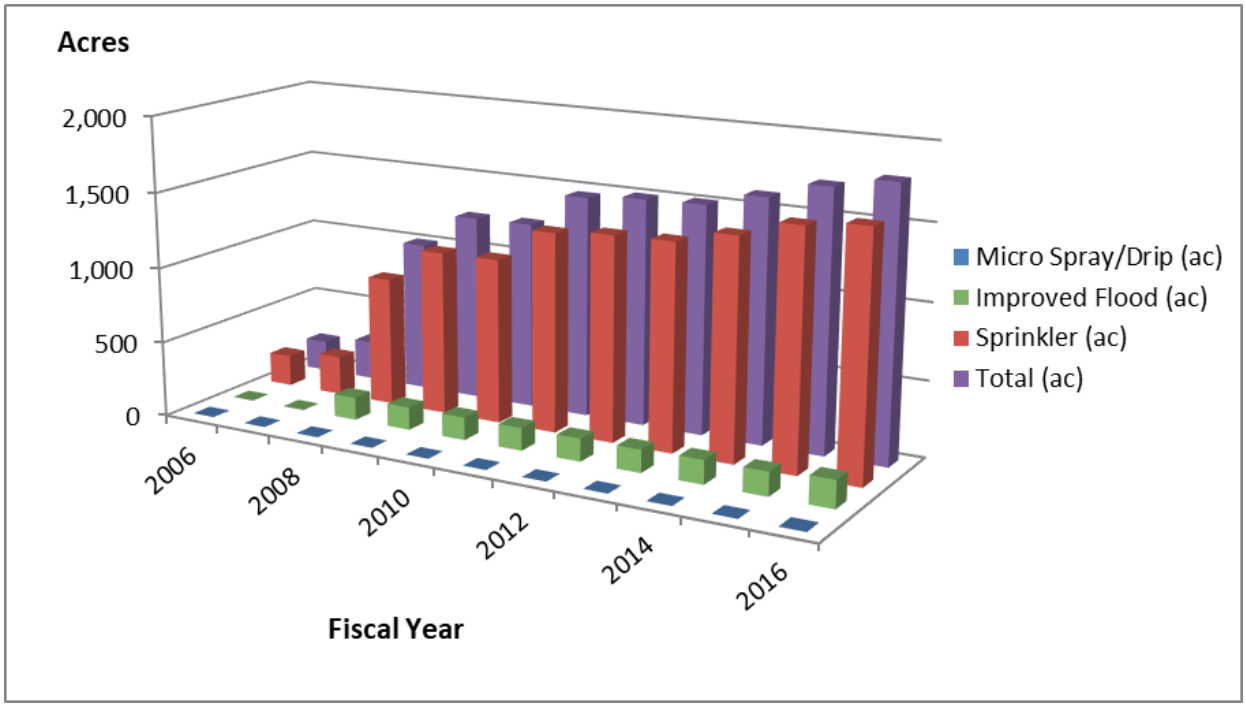
During FY 2017, NRCS treated 25 acres, reducing 124 tons of salt annually at a cost of $1103.84/ ton. Cumulative through FY 2017 NRCS has treated 11,940 acres (52% of the project goal), controlling 4,622 tons of salt annually on farm at a cost of $317.00/ ton.



The Silt Project acreage and salinity reduction goals are tracking together, and it is not known at this time how many additional irrigated acres may be treated. The number of applicants has been low the past three years however in 2017 we had 6 applications approved. There is still considerable recreational and other rural-urban development. Some of the parcels are being split into smaller units and there has been a significant change in land ownership from agriculture to hobby type farms and smaller irrigated fields. Many of the urban type landowners may not meet NRCS program eligibility and/or may not be interested in making irrigation improvements, or need the financial assistance if they do make an improvement. The project is also lagging both the concurrent goal of 32 acres of replacement habitat and the full project implementation of 50 acres of salinity habitat replacement. The final habitat replacement goal may need to be adjusted with an additional biological assessment if the project does not achieve the predicted irrigation improvement goals.

Current Year

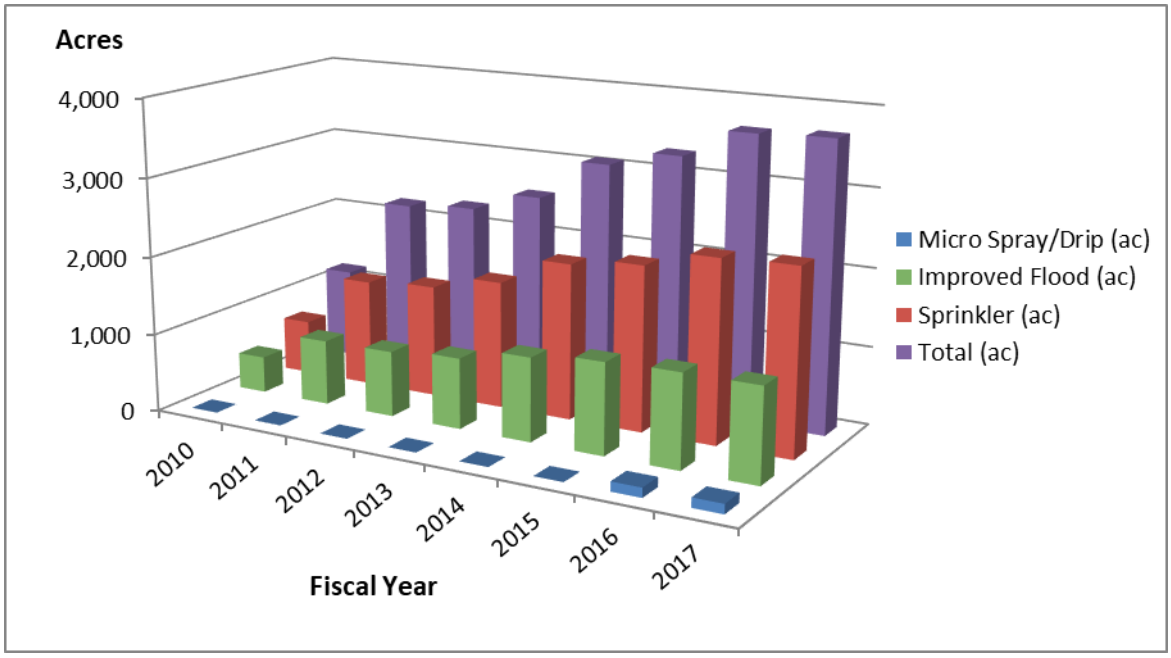
During FY 2017, NRCS treated 1 acre, reducing186 tons of salt annually at a cost of $248.97/ ton. Cumulative through FY 2017 NRCS has treated 1,784 acres (64% of the project goal), controlling 2,512 tons of salt annually on farm at a cost of $327.00/ ton.



Out-of Project Area (OPA) or Tier 2 utilizes small amounts of designated salinity funding to cost-share individual irrigation improvement projects within the Colorado River basin outside of designated salinity control units to accomplish additional salinity control. The OPA projects provide a way to achieve extra salinity control benefits with funds un-used within the designated salinity control units. The USDI-Geological Survey, **SPA**tially-**R**eferenced **R**egression **O**n **W**atershed attributes (SPARROW) model provides salt loading by catchment and was used to determine uniform agricultural salt loading data for all basins within the Colorado River drainage. The SPARROW model salt loading rates for catchments within the upper Colorado River Basin and the offered level of irrigation system improvement are used to predict a salt load reduction for each individual project. The OPA projects selected continue to offer a very cost-effective way to accomplish additional salinity control to help supplement program goals.

Current Year

During FY 2017, NRCS treated 34 acres, reducing 46 tons of salt annually at a cost of $164.31/ ton. Cumulative through FY 2017 NRCS has treated 3,679 acres, controlling 4,962 tons of salt annually on farm at a cost of $121/ ton.



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".

Other information please contact:

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