

Monitoring and Evaluation Report Colorado River Salinity Control Units

Lower Gunnison, McElmo Creek, Mancos Valley, Silt,
Grand Valley (completed salinity unit), Out-of-Project Tier 2

Fiscal Year 2015

USDA-NRCS
Delta, Colorado
Montrose, Colorado
Cortez, Colorado
Glenwood Springs, Colorado
Grand Junction, Colorado
Denver, Colorado



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EXECUTIVE SUMMARY

LOWER GUNNISON UNIT FY 2015

Lower Gunnison Unit Hydro-Salinity -

- ◆ The project plan is to treat approximately **115,000 acres**^{/1} with improved irrigation systems.
- ◆ To date **67,016 acres**^{/2} have been treated with improved irrigation systems.
- ◆ The project plan is to reduce salt loading to the Colorado River system by **166,000 tons/year** of salt.
- ◆ In FY 2015, salt loading has been reduced an additional **1,860 tons/year** as a result of installed salinity reduction practices.
- ◆ The cumulative salt load reduction is **119,057 tons/year**, or **72 percent** of the project goal.

^{/1} Note: The original project plan was to treat 135,000 acres with improved irrigation systems. Due to urban development and other small acreage land-use changes, it is estimated the net acreage needing treatment under the USDA portion of the Salinity Control Program has been reduced by approximately 15 percent.

^{/2} Note: The 67,016 acres include fields that have been treated a second time to a higher level of irrigation improvement and salt savings over the course of this salinity project.

Lower Gunnison Unit Cost Effectiveness -

- ◆ The planned cost per ton of salt saved with FY 2015 contracts (one year) is **\$167.75 /ton**. This figure is calculated as follows:

(FA + TA = Total Cost) X Amortization factor = Amortized cost

Amortized cost / Tons salt reduced = Cost/Ton

FA = Total dollars obligated in EQIP and Basin States/ Parallel Program (including wildlife)

Amortization for 2015 = 0.0598

TA = technical assistance cost: (FA x 0.67)

Lower Gunnison Unit Wildlife Habitat Replacement -

- ◆ The wildlife habitat replacement goal is at 2% of the current irrigation improvement acres, or 2% of 67,016 acres irrigation improvement acres equal a current goal of **1,340 acres** of wildlife habitat replacement developed or significantly enhanced.
- ◆ In Fiscal Year 2015, **18.4 acres** of salinity replacement wetland habitat and **143.6 acres** of salinity replacement upland habitat have been reported as applied, for a total of **162 acres** of salinity replacement habitat.
- ◆ To date, a cumulative **1,400 acres** of suitable salinity wildlife habitat replacement or **104%** of the current wildlife replacement goal has been established and is being maintained.
- ◆ Additional efforts are being made through wildlife only sign-ups, with various conservation groups, and with other Federal and State agencies to continue the implementation of wildlife habitat enhancement projects.

Lower Gunnison Unit Key Considerations and Conclusions –

- ◆ Interest in EQIP participation remains high, with the majority of applications pursuing financial assistance for irrigation system improvements. Continued economic recovery and outreach activities have contributed to the steady interest in program participation.
- ◆ A Salinity Field Coordinator position was created and filled this past year. The employee assisted multiple unincorporated and incorporated ditches in preparing for and submitting applications to the USBR's Salinity Basin-wide Program, and also conducted/coordinated events to educate water users.
- ◆ Basin States Program (BSP) funding has been limited, but a total of 4 BSP applications have been preapproved this past fiscal year.
- ◆ Interest in the USBR Salinity Basin Wide Program has increased significantly. As ditch and canal companies receive program funding and projects are completed, interest in on-farm improvements is also expected to rise in the areas serviced by the improved delivery systems.
- ◆ Interest in soil health continuing to support better crop quality and better utilization of nutrient and water resources. It is expected the salinity load reduction to the river and overall water quality will improve as conservation and management practices are implemented to improve overall soil health on the irrigated fields.
- ◆ There is a significant increase in applications in Montrose and Ouray Counties that involve various types of sprinkler systems, which is due in part to the increased emphasis and outreach of the Selenium Task Force and the Soil Health Initiative.
- ◆ In 2007, when the NRCS and USFWS agreed to the 2 acre per 100 acres wildlife habitat replacement goal, the Lower Gunnison Unit was at 60 percent of the concurrent acreage replacement goal. Over the past 7 years additional emphasis has been placed on increasing the number and size of wildlife habitat replacement projects. The wildlife habitat replacement totals in 2009 through 2015 in the Lower Gunnison Unit increased respectively from 60% to 104% of the concurrent goaled acres. Although it was previously projected the Lower Gunnison Unit would not be fully concurrent until FY 2019, the extra effort in promoting and establishing good wildlife projects achieved this goal earlier than expected. With the additional habitat acres in active contracts and continued outreach this concurrent trend is expected to continue into the future.
- ◆ A Regional Conservation Partnership Program application within the Lower Gunnison Salinity Control Unit has been approved. The RCPP project will treat additional irrigation delivery systems, and when implemented may generate further interest in on-farm salinity irrigation improvement applications.
- ◆ **The concurrent wildlife replacement status is at 104% of the goaled acres based on 2 acres of wildlife habitat replacement for each 100 acres of irrigation system improvement in place, and this increase represents success in meeting the concurrent replacement goal.**
- ◆ **In addition to the significant improvement in meeting the concurrent replacement status, in FY 2015 there were 113.5 acres of replacement wildlife habitat planned that will result in additional habitat acres being installed over the next few years.**

EXECUTIVE SUMMARY MCELMO CREEK UNIT FY 2015

McELmo Creek Unit Hydro-Salinity -

- ◆ The project plan was to treat approximately **21,550 acres** with improved irrigation systems.
- ◆ To date **15,897 acres**^{1/} have been treated with improved irrigation systems.
- ◆ The project plan is to reduce salt loading to the Colorado River system by **48,600 tons/year** of salt.
- ◆ In FY 2015, salt loading has been reduced an additional **978 tons/year** as a result of installed salinity reduction practices.
- ◆ The cumulative salt load reduction is **29,455 tons/year**, or **61 percent** of the project goal.

^{1/} Note: The 15,897 acres include fields that have been treated a second time to a higher level of irrigation improvement and salt savings over the course of this salinity project.

McElmo Creek Unit Cost Effectiveness -

- ◆ The planned cost per ton of salt saved with FY 2015 contracts (one year) is **\$126.27 /ton**. This figure is calculated as follows:

$(FA + TA = \text{Total Cost}) \times \text{Amortization factor} = \text{Amortized cost}$

$\text{Amortized cost} / \text{Tons salt reduced} = \text{Cost/Ton}$

FA = Total dollars obligated in EQIP and Basin States/ Parallel Program (including wildlife)

Amortization for 2015 = 0.0598

TA = technical assistance cost: (FA x 0.67)

McELmo Creek Unit Wildlife Habitat Replacement –

- ◆ The wildlife habitat replacement goal is at 2% of the current irrigation improvement acres, or 2% of 15,897 acres irrigation improvement acres equal a current goal of **318 acres** of wildlife habitat replacement developed or significantly enhanced.
- ◆ In Fiscal Year 2015, **12.0 acres** of suitable salinity wetland and upland replacement habitat were reported as applied.
- ◆ To date, a cumulative **280 acres**^{1/} or **88%**^{2/} of the current wildlife habitat replacement goal had been reported as applied. The field inventory confirmed these meet suitable salinity habitat replacement acres, are still being maintained, and can be tracked.
- ◆ Efforts are being made through wildlife only sign-ups, with various conservation groups, and with other Federal and State agencies to promote the implementation of wildlife habitat enhancement projects.

^{1/} Please see habitat assessment write-up in the McElmo Creek Unit Wildlife Activities Section starting on page 79.

^{2/} Assume a full project implementation at 21,550 acres of irrigation treatment at 2 acres of wildlife habitat replacement per 100 acres of irrigation improvements, for a total 431 acres of wildlife habitat replacement needed, or the project currently meets 65% of the full project wildlife habitat replacement needs.

McElmo Creek Unit Key Considerations and Conclusions –

- ◆ The 280 acres of suitable salinity wildlife habitat replacement confirmed to date does not meet current wildlife habitat replacement requirements.
- ◆ The wildlife habitat replacement and field assessment is complete. Results indicate some of the reported habitat improvements were lost due to development and other land-use changes.
- ◆ The habitat assessment was not able to track all habitat projects previously reported as applied due to changes in staff and missing inventory data, so some of the habitat acres were not confirmed due to the lack of available information.
- ◆ One habitat project was applied on 12.0 acres and one new wildlife habitat contract was approved for funding on 0.5 acres.
- ◆ The number of salinity applications increased slightly for 2015 and for this fiscal year the typical contract had a slightly higher dollar amount per contract.
- ◆ Continued reduced planning staff due to retirements and delays with refilling positions resulted in a backlog of conservation planning which led to a small reduction in the percentage of applications resulting in an obligated salinity contract.
- ◆ It has been noted that an increase in small acreage development has been occurring in the McElmo salinity unit. Much of this development is associated with a home sites placed on an irrigated field of 5 acres or less. This trend will likely result in an increase in the number of future contracts, and with smaller field sizes there may be fewer acres treated and a lower average dollar amount per contract.
- ◆ There continues to be a strong desire of Montezuma Valley Irrigation Company (MVIC) to increase the efficiency of their irrigation system by piping many of the small laterals. The reintroduction of the Basin Salinity Program could provide a much needed source of funding to continue the improvements by MVIC on some of the smaller irrigation laterals, and piping additional delivery laterals will likely lead to an increase in on-farm irrigation improvements. MVIC in cooperation with the Dolores Water Conservancy District submitted a Regional Conservation Partnership Program (RCP) proposal to help improve the MVIC delivery system, which would enable additional landowners to improve water conservation practices.
- ◆ Other smaller irrigation companies in the McElmo Creek Unit are also interested in improving various segments of their irrigation delivery system. These types of irrigation improvements provide salinity control and will likely encourage additional on-farm irrigation system improvements.

EXECUTIVE SUMMARY MANCOS VALLEY UNIT FY 2015

Mancos Valley Unit Hydro-Salinity -

- ◆ The project plan is to treat approximately **5,400 acres** with improved irrigation systems.
- ◆ To date **2,748 acres** have been treated with improved irrigation systems.
- ◆ The project plan is to reduce salt loading to the Colorado River system by **11,940 tons/year** of salt.
- ◆ In FY 2015, salt loading has been reduced an additional **18 tons/year** as a result of installed salinity reduction practices.
- ◆ The cumulative salt load reduction is **4,426 tons/year**, or **37 percent** of the project goal.

Mancos Valley Unit Cost Effectiveness -

- ◆ The planned cost per ton of salt saved with FY 2015 contracts (one year) is **\$268.00 /ton**. This figure is calculated as follows:

(FA + TA = Total Cost) X Amortization factor = Amortized cost

Amortized cost / Tons salt reduced = Cost/Ton

FA = Total dollars obligated in EQIP and Basin States/ Parallel Program (including wildlife)

Amortization for 2015 = 0.0598

TA = technical assistance cost: (FA x 0.67)

Mancos Valley Unit Wildlife Habitat Replacement –

- ◆ The wildlife habitat replacement goal is at 2% of the current irrigation improvement acres, or 2% of 2,748 acres irrigation improvement acres equal **55 acres** of habitat developed or significantly enhanced.
- ◆ In Fiscal Year 2015, **4.5 acres** of suitable salinity wetland and upland replacement habitat were reported as applied or planned in the Mancos Valley Unit.
- ◆ The ongoing field inventory has confirmed **103 acres**^{1/} of suitable salinity replacement habitat have been applied, still being maintained, and can be tracked, or **187%**^{2/} of the current wildlife habitat replacement goal. The habitat field inventory in the Mancos Valley Unit is complete.
- ◆ Additional efforts are being made through wildlife only sign-ups, with various conservation groups, and with other Federal and State agencies to continue the implementation of wildlife habitat enhancement projects.

^{1/} Within the Mancos Valley project area there were 137 acres of wetland habitat initially reported as applied through FY 2015. The tracking inventory and field assessment is complete and confirmed 103 acres of habitat have been applied and are still being maintained as suitable salinity replacement habitat. Please see the write-up on page 83 for additional explanation.

^{2/} Assume a full project implementation at 5,400 acres of irrigation treatment at 2 acres of wildlife habitat replacement per 100 acres of irrigation improvements, for a total 108 acres of wildlife habitat replacement needed, or the project currently meets 95% of the full project wildlife habitat replacement needs.

Mancos Valley Unit Key Considerations and Conclusions –

- ◆ The Mancos Valley Unit initially projected treating a significant number of off farm irrigation delivery systems and near farm irrigation ditches. Due to the relatively lower salt loading rates in the Mancos Valley Unit, the larger irrigation delivery ditch projects proposed have not been able to compete successfully for the limited funds.
- ◆ Due to the limited delivery improvements made to date, the project is at 51% of the acreage treatment goal, but is at only 37% of the salinity reduction goal.
- ◆ In addition, the limited number of irrigation delivery improvements, are likely reducing the number of on-farm irrigation system improvement applications. Unless additional irrigation delivery system improvements are made, the project may not achieve the acreage treatment goals and the salinity reduction goals described in the initial project plan.
- ◆ Based on the habitat acres confirmed, the Mancos Valley Unit is concurrent with salinity wildlife habitat replacement and there may be sufficient replacement to account for almost all the acres needed for a full project implementation of 108 acres of habitat improvements implemented at 2 percent of 5,400 acres irrigation improvement applied.
- ◆ The wildlife habitat replacement and field assessment is essentially complete in the Mancos Valley Unit. The results indicate a few of the previously reported habitat improvements may not have been suitable salinity replacement habitat and there were slight acreage adjustments to other projects. The reported replacement totals have been adjusted accordingly.
- ◆ In addition the Mancos Valley Unit has many other smaller delivery systems with open irrigation ditches, and most are unlined delivery. The land owners in this area typically are not interested in pumping from unlined ditches to irrigate their hay crop. Additional delivery ditch piping may be needed to encourage landowners to make on-field irrigation system improvements.

EXECUTIVE SUMMARY

SILT UNIT

FY 2015

Silt Unit Hydro-Salinity -

- ◆ The project plan is to treat approximately **2,800 acres** with improved irrigation systems.
- ◆ To date **1,712 acres** have been treated with improved irrigation systems.
- ◆ The project plan is to reduce salt loading to the Colorado River system by **3,990 tons/year**.
- ◆ In FY 2015, salt loading has been reduced an additional **41 tons/year** as a result of installed salinity reduction practices.
- ◆ The cumulative salt load reduction is **2,274 tons/year**, or **57 percent** of the project goal.

Silt Unit Cost Effectiveness -

- ◆ The planned cost per ton of salt saved with FY 2015 contracts (one year) is **\$370.97 /ton**. This figure is calculated as follows:

(FA + TA = Total Cost) X Amortization factor = Amortized cost

Amortized cost / Tons salt reduced = Cost/Ton

FA = Total dollars obligated in EQIP and Basin States/ Parallel Program (including wildlife)

Amortization for 2015 = 0.0598

TA = technical assistance cost: (FA x 0.67)

Silt Unit Wildlife Habitat Replacement –

- ◆ The original Silt Unit replacement goal is **40 acres** of riparian/upland habitat and **10 acres** of wetland habitat developed or significantly enhanced.
- ◆ For Fiscal Year 2015 there were no new acres of wildlife habitat replacement applied
- ◆ To date, **19.4 acres** of suitable salinity wildlife habitat replacement or **63%**^{1/} of the concurrent wildlife habitat replacement goal and **39%** of the full project cumulative wildlife habitat replacement goal have been established and are being maintained.
- ◆ Additional efforts are being made through wildlife only sign-ups, with various conservation groups, and with other Federal and State agencies to accelerate the implementation of wildlife habitat enhancement projects.
- ◆ Estimated habitat losses from the current salinity control improvements to date are: Wetlands – **0 acres**; Riparian/Ditches – **15.7 acres**.
- ◆ Replacement efforts to date have yielded one wildlife habitat replacement contract completed.

^{1/} The Silt Unit concurrent value is based on the acres treated divided by the planned treatment acres, times the 50 acres of proposed wildlife habitat replacement, (1,712 ac / 2,800 ac) x 50 ac = 30.6 acres of wildlife habitat replacement to be concurrent. The percentage concurrent is based on the FY 2015 reported acres divided by the concurrent acres, 19.4 ac / 30.6 ac = 63% concurrent.

Silt Unit Key Considerations and Conclusions –

- ◆ Silt currently has 1,712 acres of applied irrigation system improvements in place out of the 2,800 acres projected for treatment in the original project plan and environmental assessment.
- ◆ The number of program participants in the Silt Unit continues to remain relatively low.
- ◆ In FY 2015 the Field Office conducted a review of all irrigation systems within the Silt Salinity Area. A GIS based approach was used to map and track all of improved and unimproved irrigation systems within the Silt Salinity Area. The analysis found there are 1,405 acres of unimproved or partially improved flood irrigation system remaining in the project area, and the Conservation District did a direct mailing to all of the landowners with the unimproved or partially improved flood irrigation systems notifying them of the financial and technical assistance available. Depending on the response from the affected landowners the final project treatment goals may need to be adjusted.
- ◆ It should also be noted the Silt Unit is affected by an increasing number of small acreage landowners starting before the beginning of salinity project and is continuing throughout the salinity project area to date. Much of this development is associated with rural home sites placed on small irrigated acreages, often on irrigated fields of 20 acres or less. This trend may be affecting the number of irrigators interested in participating and meeting eligibility requirements for EQIP salinity contracts.
- ◆ The new agreement for the Basin States Program funding may offer additional opportunities for both salinity and wildlife contracts in the Silt area with landowners who may not meet EQIP eligibility requirements.

EXECUTIVE SUMMARY

All Colorado Salinity Control Units

All Colorado Units Key Considerations and Conclusions – Wildlife

- ◆ The goal for the Colorado River Salinity Control Program is to replace wildlife values negatively impacted by irrigation improvements, and the impacted habitat will be replaced by a mix of wetland, riparian, and upland habitat providing similar values for the wildlife species affected.
- ◆ In western Colorado many of the irrigated areas have relatively small land units, and the parcels that provide the opportunity to develop water enhanced habitats are often small in size. Thus many of the habitat projects are complex in planning and habitat enhancement options, and although they offer the opportunity to provide significant habitat improvements, the private land habitat projects in the western irrigated valleys frequently provide relatively small acreages per project.
- ◆ To qualify as suitable wildlife habitat replacement, each project needs to develop or significantly enhance the habitat values for the types of species whose habitats are negatively impacted by the irrigation improvements for salinity control.
- ◆ To meet the wildlife habitat replacement goals in each project area a combination of habitat improvements on private lands, and on lands with a combined public and/or public-private partnership are being considered. The goal of expanding the replacement options are to find and fund a sufficient acreage of suitable habitat projects to meet program obligations, and to encourage wildlife habitat replacement projects with better connectivity and a longer-term life expectancy.
- ◆ Many of the wildlife habitat replacement projects take a period of time to fully develop and reach their full habitat potential. Continued follow-up with management support and habitat evaluations in the field are important to support the landowner in accomplishing their habitat goals, and to assure the reported program wildlife habitat replacement goals are being maintained.

EXECUTIVE SUMMARY GRAND VALLEY UNIT - COMPLETED PROJECT FY 2015

Grand Valley Unit Completed Project Hydro-Salinity -

- ◆ The original project plan was to treat approximately **60,000 acres** with improved irrigation systems.
- ◆ The field inventory conducted in 2010 indicated there were **47,600 irrigated cropland acres** remaining in Grand Valley including **2,900 irrigated acres** with unimproved irrigation systems, most on fields of **5 acres or less**.
- ◆ The adjusted potential full treatment goal for the NRCS program is at 90% of the remaining irrigated acres or approximately **42,800 acres**.
- ◆ To date **42,860 acres**^{1/} or **100 percent** of the project acreage goals have been treated with improved irrigation systems.
- ◆ The project plan is to reduce salt loading to the Colorado River system by **132,000 tons/year** of salt.
- ◆ In FY 2015, salt loading has been reduced an additional **72 tons/year** as a result of installed salinity reduction practices.
- ◆ The cumulative salt load reduction is **143,495 tons/year**, or **109 percent** of the project treatment goal.

^{1/} Note: The 42,860 acres include acres that have been treated a second time to a higher level of irrigation improvement and salt savings over the course of this salinity project.

Grand Valley Unit Completed Project Cost Effectiveness -

- ◆ The planned cost per ton of salt saved with FY 2015 contracts (one year) is **\$114.77 /ton**. This figure is calculated as follows:

(FA + TA = Total Cost) X Amortization factor = Amortized cost

Amortized cost / Tons salt reduced = Cost/Ton

FA = Total dollars obligated in EQIP and Basin States/ Parallel Program (including wildlife)

Amortization for 2015 = 0.0598

TA = technical assistance cost: (FA x 0.67).

Grand Valley Unit Completed Project Wildlife Habitat Replacement –

- ◆ The Grand Valley wildlife habitat replacement goal is **1,200 acres** of habitat developed or significantly enhanced.
- ◆ The inclusion of DeBeque and Whitewater irrigation improvements to date have added an additional **6 acres** of replacement for a current total of **1,206 acres**
- ◆ For Fiscal Year 2015 there were no new acres of wildlife habitat replacement applied.
- ◆ One EQIP wildlife habitat replacement plan was completed for **3.3 acres** in FY 2015.
- ◆ To date, **778 acres** of suitable salinity wildlife habitat replacement or **64%** of the original wildlife habitat replacement goal has been established and is being maintained.

- ◆ Continuing efforts are being made through wildlife only sign-ups, with various conservation groups, and with other Federal and State agencies to accelerate the implementation of wildlife habitat enhancement projects.
- ◆ The **490 acres** of wildlife habitat replacement planned and funded on Colorado Parks and Wildlife (CPW) land with a BSP contract, and the CPW project acres combined with the other wildlife habitat replacement projects currently under contract, provide enough additional acres that when all habitat is applied as planned the Grand Valley Unit will exceed the **1,206 acre** replacement goal. When all of the habitat improvement projects currently under contract are implemented, the total acres will provide **approximately 100 acres of wildlife habitat replacement over the minimum requirement** for the Grand Valley Unit.
- ◆ The Colorado Parks and Wildlife Project is currently underway with **\$129K** of habitat replacement work completed to date.

Grand Valley Unit Completed Project Key Considerations and Conclusions –

- ◆ The follow-up sample inventory of irrigation improvement practices installed throughout the 1979-2011 salinity control program identified 98.3% of the reported salinity reduction is still being accomplished.
- ◆ A similar follow-up assessment is scheduled to be done on a three-year interval to evaluate the salinity control projects installed through the program to assure the retention and maintenance of the publically supported salinity control benefit. The data from the analysis will be reported to the Salinity Control Forum to support their triennial review. The total duration of these triennial assessments has not been determined at this time.
- ◆ The next triennial sample inventory of installed irrigation improvement practices was scheduled for FY 2014, however due to changes in staff occurring during the following two summer field seasons, the inventory was not completed as scheduled and the FY 2014 inventory will be done in FY 2016.
- ◆ The agency Salinity Program Managers should work with the Salinity Control Forum to develop policy defining a recommended period of assessment after the conclusion of each Salinity Control Project.
- ◆ The USDI-US Bureau of Reclamation portion of the Grand Valley Salinity Control Unit is still considered an active salinity control unit, and only the NRCS on-farm portion is considered essentially complete.
- ◆ Future on-farm irrigation improvements and public cost-share funding will still be available in the Grand Valley area through the Environmental Quality Incentives Program (EQIP) for irrigation improvement, salinity control, and other water quality resource concerns.

EXECUTIVE SUMMARY

COLORADO TIER 2 SALINITY IMPROVEMENT PROJECTS

FY 2015

Tier 2 Salinity

US Geological Survey, **SP**atially-Referenced **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 data has been accepted to calculate the cost-effectiveness and reportable salt load reduction for irrigation improvement projects outside of the established Colorado River Salinity Control Units. Irrigation projects contributing to the salinity load reduction and meeting certain established quality criteria may be funded with designated salinity funds, when there is extra “salinity” funding not obligated within the established project areas. These salinity funded irrigation improvements are designated as Tier 2 salinity control projects.

Tier 2 Hydro-Salinity -

- ◆ To date **2,372 acres** have been treated with improved irrigation systems as qualified Tier 2 Salinity Control Projects.
- ◆ In FY 2015, salt loading has been reduced an additional **407 tons/year** as a result of the installed salinity reduction practices.
- ◆ The cumulative salt load reduction for western Colorado Tier 2 Projects is **4,437 tons/year.**

Tier 2 Cost Effectiveness -

- ◆ The planned cost per ton of salt saved with FY 2015 contracts (one year) is **\$70.41 /ton.** This figure is calculated as follows:

(FA + TA = Total Cost) X Amortization factor = Amortized cost
Amortized cost / Tons salt reduced = Cost/Ton
FA = Total dollars obligated in EQIP and Basin States/ Parallel Program (including wildlife)
Amortization for 2015 = 0.0598
TA = technical assistance cost: (FA x 0.67)

Tier 2 Key Considerations and Conclusions –

- ◆ The Tier 2 projects remain a cost-effective means of achieving additional Colorado River salinity control and offer an effective way to use allocated salinity control funds as the number of sign-ups change in the established project areas.
- ◆ Per the National Environmental Quality Incentive Program Environmental Assessment, each Tier 2 project has a site specific environmental evaluation ^{1/} done to assess and record the anticipated project impacts, including impacts to water enhanced wildlife habitat.

^{1/} The site specific Environmental Evaluation (EE) process used by the NRCS is discussed on page 65.

HYDRO-SALINITY MONITORING AND EVALUATION, COLORADO

Introduction

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.

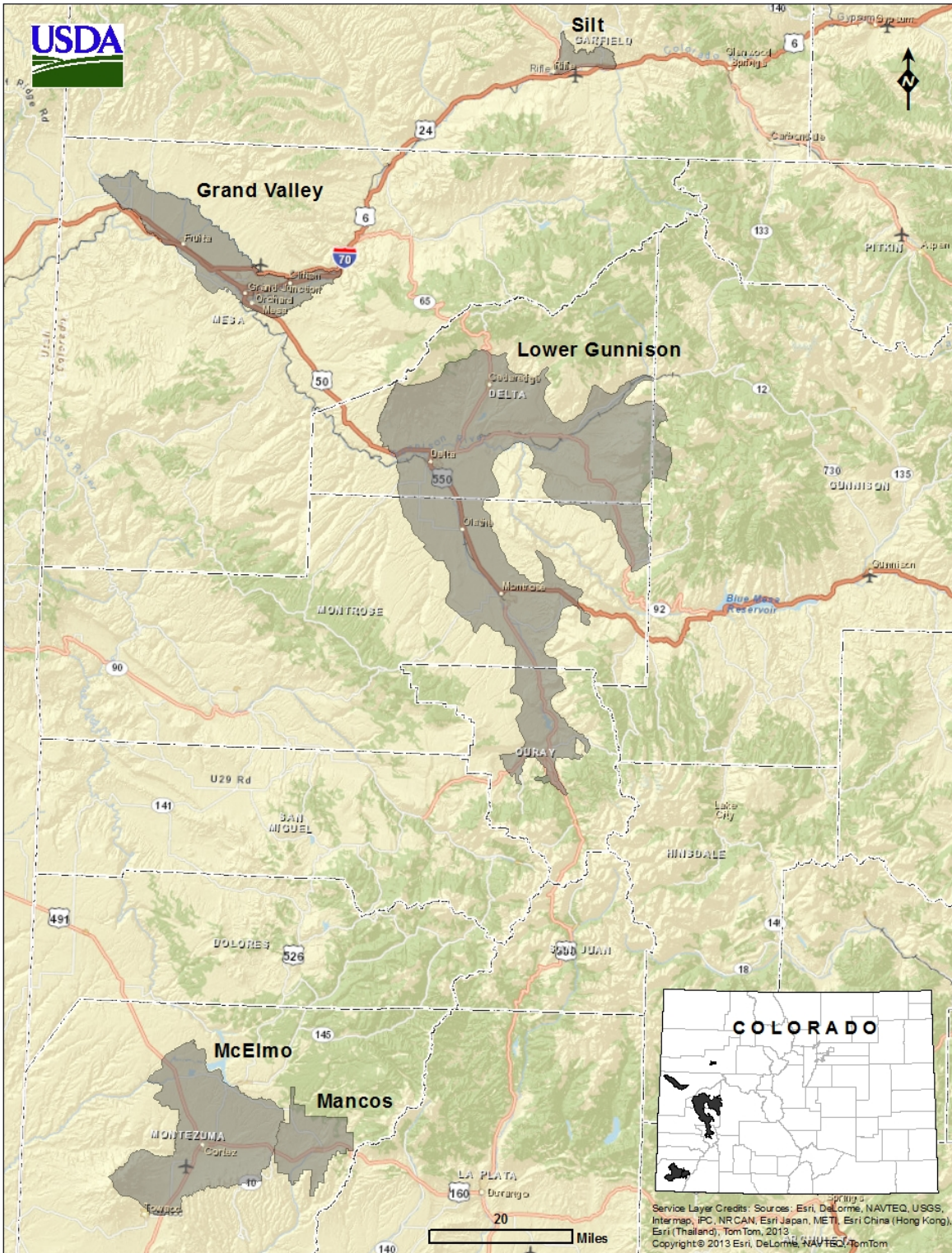
The Environmental Protection Agency (EPA) promulgated a regulation in December, 1974, which established a basin wide salinity control policy for the Colorado River Basin and also established a water quality standards procedure requiring basin states to adopt and submit for approval to the EPA, standards for salinity, including numeric criteria and a plan of implementation. In 1984, PL 98-569 amended the Salinity Control Act, authorizing the USDA Colorado River Salinity Control Program. Congress appropriated funds to provide financial assistance through Long-Term Agreements administered by Agricultural Stabilization and Conservation Service (ASCS) with technical support from the Soil Conservation Service (SCS). PL 98-569, also required continuing technical assistance along with monitoring and evaluation to determine the effectiveness of measures applied.

In 1995, PL 103-354 reorganized several agencies of USDA, transforming SCS into the Natural Resources Conservation Service (NRCS) and ASCS into the Farm Services Agency (FSA). In 1996, the Federal Agricultural Improvement and Reform Act (PL 104-127) combined four existing programs, including the Colorado River Basin Salinity Control Program, into the Environmental Quality Incentives Program (EQIP). The Farm Security and Rural Investment Act of 2002 and Food, Conservation, and Energy Act of 2008 reauthorized and amended EQIP, continue opportunities for USDA funding of salinity control measures. Additional reauthorization legislation continues the program to the present day.

Colorado River Salinity Control

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 1982 the NRCS identified the need to establish an irrigation monitoring and evaluation program for Grand Valley to assess the effects to deep percolation and seepage from making the various irrigation improvements, and to assess economic impacts and wildlife habitat replacement activities.

Map 1 - Colorado River Salinity Control Project Areas in Colorado



Irrigation in the Colorado salinity control areas is characterized by mostly gravity-fed systems installed on heavy clayey soils or medium textured soils derived from or overlaying a marine shale formation (typically Mancos shale) that is very saline. The intake rates of the soils are generally low to medium. Plentiful and inexpensive irrigation water coupled with the long irrigation set times, and typically abundant flow rates contribute to the potential salinity mobilization. The available irrigation water and lower efficiency irrigation systems leads to excess deep percolation loss of water and low application efficiencies. The excess water from deep percolation contacts the underlying Mancos shale and subsequently loads salt to the Colorado River. Changes to deep percolation and ditch seepage are considered to be the primary indicators of the effectiveness of the irrigation application.

A variety of irrigation systems were evaluated including earthen ditches with earth feeder ditches, earthen ditches with siphon tubes, concrete ditches with siphon tubes, ported concrete ditches, pipeline to gated pipe, side roll sprinklers, and micro spray. Crops included alfalfa, corn, small grain, dry beans, orchards, grapes, onions, pasture, and vegetables. This monitoring of irrigation system performance took place through the Salinity Program period from 1984 through 2003. The monitoring of wildlife and economic impacts started with each project and continues throughout the life of the project.

The NRCS developed a Monitoring and Evaluation Plan to assess the effects of the Colorado River Basin Salinity Control Program being implemented, "Monitoring and Evaluation Plan, Colorado River Basin Salinity Control Program for Grand Valley Unit, Colorado and Uinta Basin Unit, Utah, July 1982." The long-range monitoring plan described uniform guidelines and procedures to assess the effectiveness of the NRCS program to reduce salt loading to the Colorado River, to determine the effects of the irrigation improvements on wildlife, and to identify the monetary benefits to the individual participants.

Colorado NRCS initiated irrigation monitoring in the Grand Valley Unit in 1984 and to a limited extent in the Lower Gunnison Unit in 1992 and the McElmo Unit in 1993. The irrigation monitoring was designed to assess deep percolation changes and estimate changes to the salt loading derived from irrigated agricultural lands. Those assessments provided a baseline of deep percolation characteristics on agricultural land, and have been used by NRCS to make management decisions related to salinity control projects. Colorado State University, Cooperative Extension took over the irrigation monitoring activities from 1999 through 2003 utilizing the NRCS equipment and similar sampling techniques. The NRCS also conducted selected economic analysis and wildlife habitat analysis in all of the project areas.

The irrigated monitoring sites were selected to represent the variety of conditions common in the salinity control units. The need was identified for each irrigation event to be monitored and evaluated throughout the irrigation season for each site. From the NRCS Monitoring and Evaluation Plan, "Data will be collected to determine the amount of irrigation water infiltrated into the soil." "For each site on-farm water budgets will be prepared for each irrigation event, starting with pre-plant or start of growing season until crop harvest. The most significant output from the water budget is deep percolation. The plan proposed water budget was, "...deep percolation equals the amount of inflow plus rainfall prior to or during the irrigation event, less surface runoff and the net irrigation requirement [expressed as the amount of water needed to bring the soils profile to field capacity]." Data was compiled for 289 site years of measured irrigation inflows, outflows, crop consumptive use, precipitation, and deep percolation.

The data indicate that the salinity projects in Colorado are typically achieving a deep percolation plus field ditch seepage reduction of at least 10 to 15 inches for each acre treated, which meets or exceeds the deep percolation reduction estimated in the original project reports. Areas with a greater conversion to sprinkler or micro spray will be at the 15 inch reduction and areas with predominantly flood irrigation will be at the 10 inch reduction. Areas that are converting from unimproved flood systems will have deep percolation plus seepage reductions in the 25 to 30 inch range. Areas that are converting very old flood irrigation systems with limited improvements, will most likely be somewhere between the higher values and the lower values, but probably closer to the 10 to 15 inch reduction.

Table 1 - NRCS Irrigation Application Efficiency Standards for Evaluation

TYPE OF IRRIGATION SYSTEM	% OF MONITORED EFFICIENCY
Open ditch	35%
Open ditch w/ siphon tubes	40%
Concrete ditch w/siphon tubes	50%
Gated pipe	50%
Underground pipe & Gated pipe	50%
Underground pipe/Gated pipe/Surge	55%
Center Pivot Sprinkler	90%
Big Gun Sprinkler	70%
Side roll Sprinkler	75%
Micro spray	90%
Drip Irrigation	95%

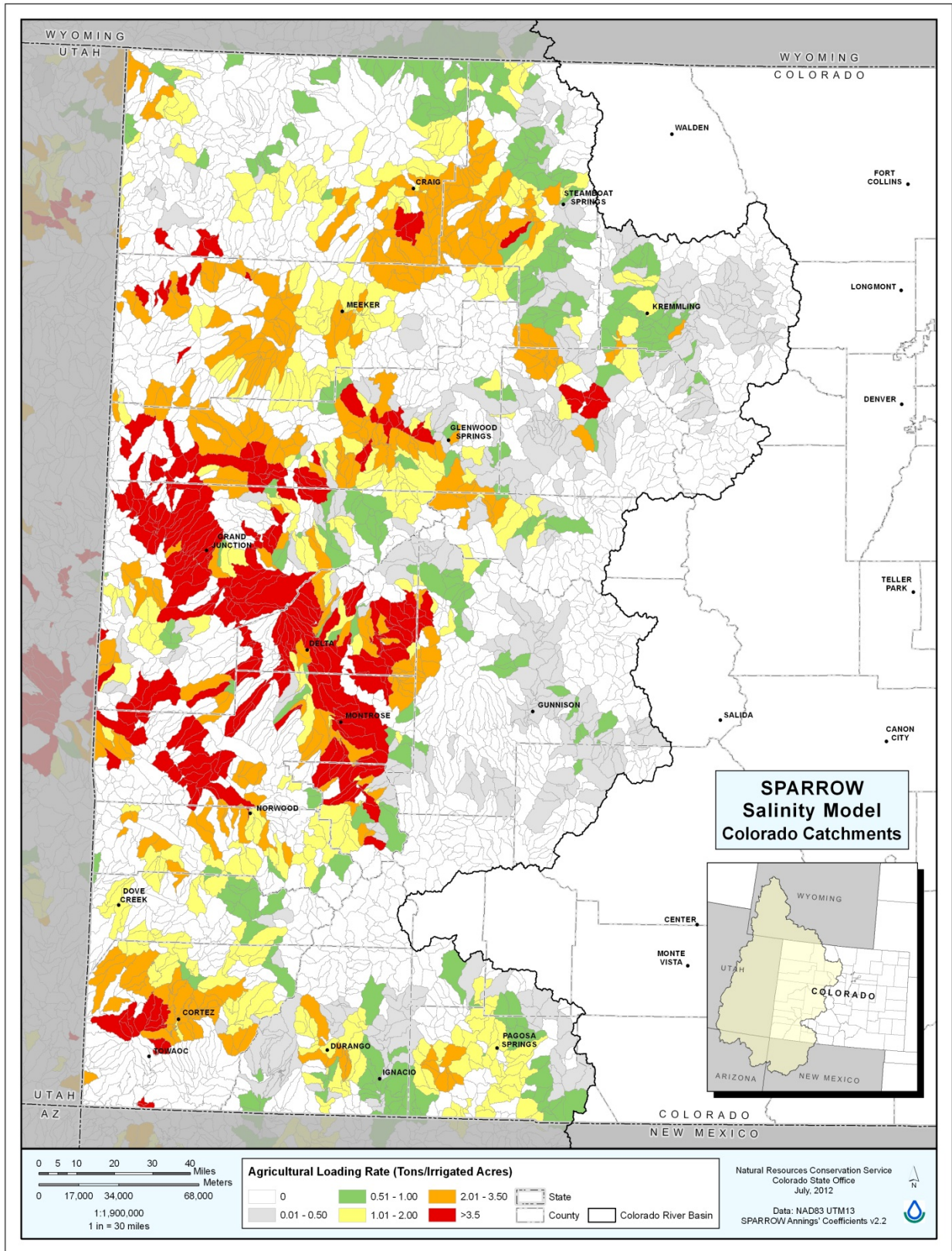
Note: Efficiencies listed are the NRCS planning standards for the various types of irrigation systems.

Colorado Out-of-Project Area Tier 2 Salinity Control based on the USGS SPARROW Model Catchment Loading Rates

Tier 2 Salinity

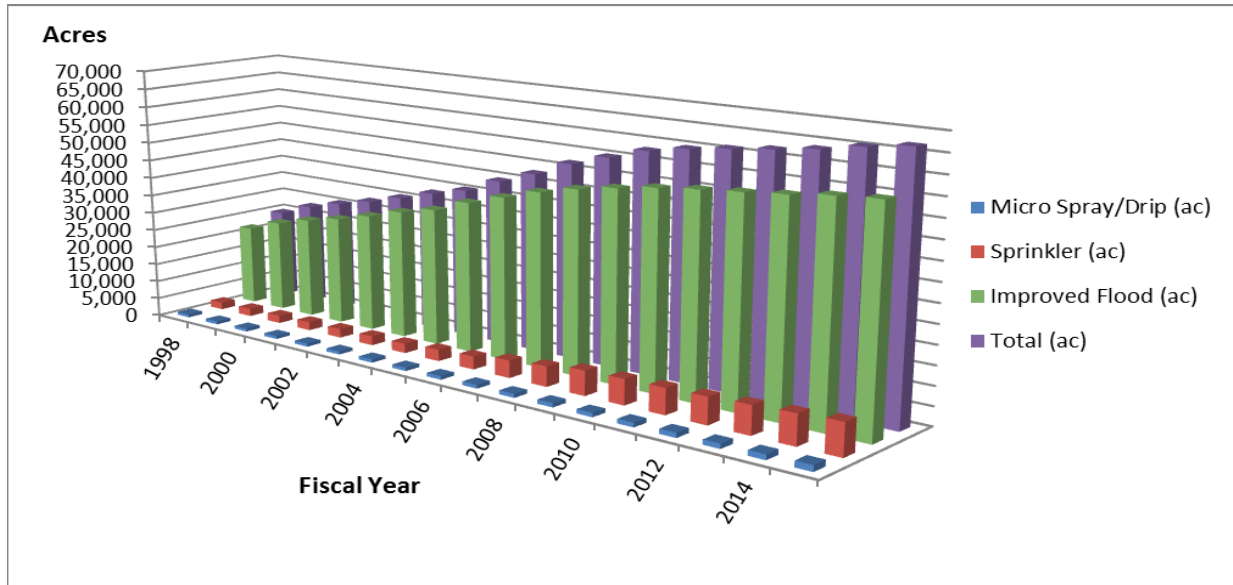
US Geological Survey, **SP**atially-Referenced **R**egression **O**n **W**atershed attributes (**SPARROW**) model provides salt loading by catchment and was used to determine uniform agricultural salt loading data for all basins within the Colorado River drainage. The SPARROW data has been accepted to calculate the cost-effectiveness and reportable salt load reduction for irrigation improvement projects outside of the established Colorado River Salinity Control Units. Irrigation projects contributing to the salinity load reduction and meeting certain established quality criteria may be funded with designated salinity funds, when there is extra “salinity” funding not obligated within the established project areas. These salinity funded irrigation improvements are designated as Out of Project Area (OPA) Tier 2 salinity control projects.

Map 2 - Colorado River Basin USGS SPARROW Catchments in Colorado



Colorado Salinity Control Unit Irrigation System Improvements

Graph 1 – Lower Gunnison Unit Cumulative Irrigation Systems Installed



IRRIGATION SYSTEMS APPLIED (acres)	FY 2015	CUMULATIVE
Sprinkler	516	8,502
Improved Surface System	729	56,888
Micro-Spray/Drip System	203	1,626
TOTAL	1,448	67,016

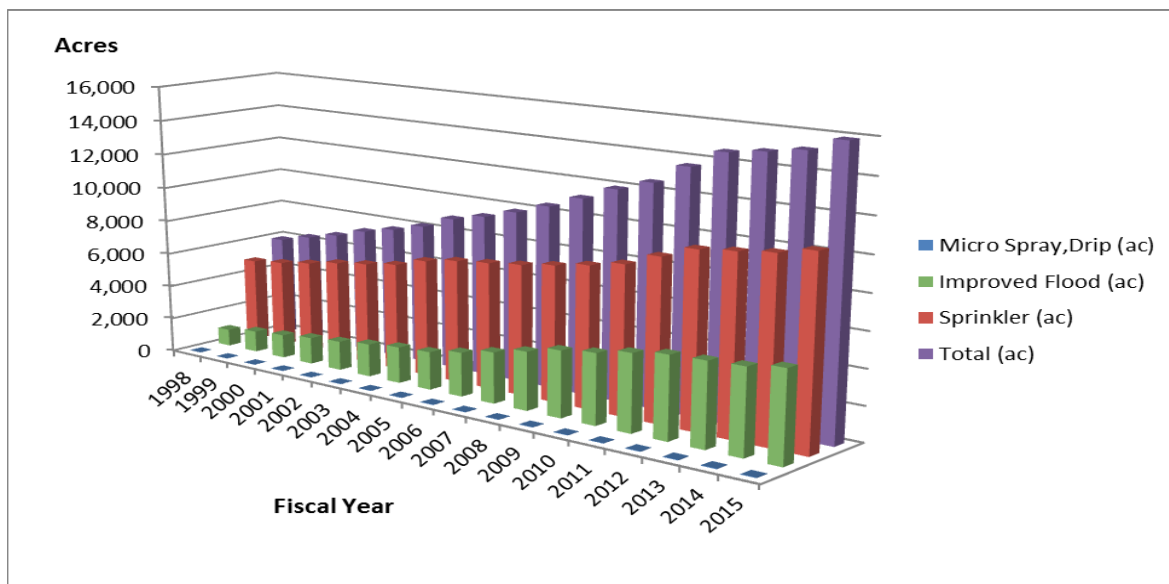
Graph 1 and sub-set table display the cumulative acres of the various irrigation improvements in the Lower Gunnison project area. The earliest micro-spray systems were installed in the late 1980's, and there has been a relatively consistent, although small acreage of micro-spray/drip irrigation systems installed through-out the life of the project.

The Lower Gunnison Unit typically has some areas with larger and more uniform field sizes where sprinkler system are becoming more popular, however many areas have relatively small and sometimes irregular field sizes that make the installation of field sprinkler systems problematic. In addition, the relatively flat topography in the areas with the larger field sizes limits the opportunity to build gravity pressure through pipeline delivery systems, so the sprinkler systems in this area typically require some type of pumped pressure to operate. Regardless, there has been an increase in the number of sprinkler systems installed on some of the larger and more uniform fields in more recent years. The ease of operation and uniformity of application make sprinklers a desirable option for many irrigators, although when the installation includes a regulating pond, pump installation, and the associated energy and maintenance costs, it complicates the decision and increases both the installation and operating costs for the system.

The number of vineyard and orchard operations in some of the upper areas in the Lower Gunnison unit account for most of the drip and micro-spray systems installed, and although they represent a significant number of systems, the fields are typically small and do not account for a large acreage. The systems perform very well from an irrigation application efficiency perspective, but are often relatively expensive on a per acre treatment basis and typically are more attractive for the high value crops.

In the project area the deep percolation reduction and subsequent salinity control is typically about 50 to 60% reduction for a well-managed improved flood system, about 75 to 85% reduction for a well-managed sprinkler system, and about 85 to 95% reduction for a well-managed drip or micro-spray system.

Graph 2 – McElmo Creek Unit Cumulative Irrigation Systems Installed



IRRIGATION SYSTEMS APPLIED (acres)	FY 2015	CUMULATIVE
Sprinkler	409	10,699
Improved Surface System	309	5,167
Micro-Spray/Drip System	0	31
TOTAL	718	15,897

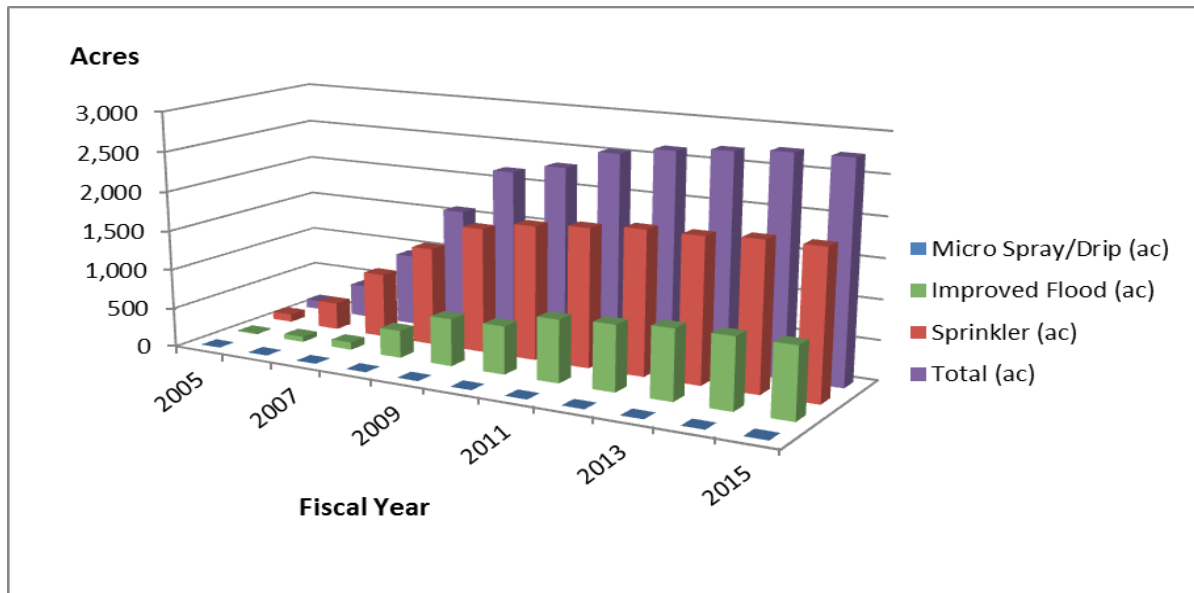
Graph 2 and sub-set table display the cumulative acres of the various irrigation improvements in the McElmo Creek Unit. The earliest micro-spray systems were installed in the late 1980's, and there has been intermittent installation and very limited acreage of micro-spray/drip irrigation systems installed through-out the life of the project.

The McElmo Creek Unit typically has some areas with larger and more uniform field sizes where sprinkler systems are popular, however many areas have relatively small and some irregular field sizes that make the installation of field sprinkler systems problematic. There have been a relatively consistent number of sprinkler systems installed in the unit, although the acreage under sprinkler is lagging behind the predicted levels of treatment described in the original plan. The ease of operation and uniformity of application make sprinklers a desirable option for many irrigators, although if the installation includes a regulating pond, pump installation, and the associated energy and maintenance costs, it complicates the decision and increases both the installation and operating costs for the system. Additional pressurized piped delivery laterals will make sprinklers a more desirable option for many irrigators.

The change in land ownership and subdivision of some units into rural ranchettes, make the selection of flood irrigation more common on the smaller and sometimes irregular shaped fields. In addition, for many smaller units maximum production may not be a primary concern and some of the small acreage landowners may consider irrigation as a part-time recreational pursuit.

In the project area the deep percolation reduction and subsequent salinity control is typically about 50 to 60% reduction for a well-managed improved flood system, about 75 to 85% reduction for a well-managed sprinkler system, and about 85 to 95% reduction for a well-managed drip or micro-spray system.

Graph 3 – Mancos Valley Unit Cumulative Irrigation Systems Installed



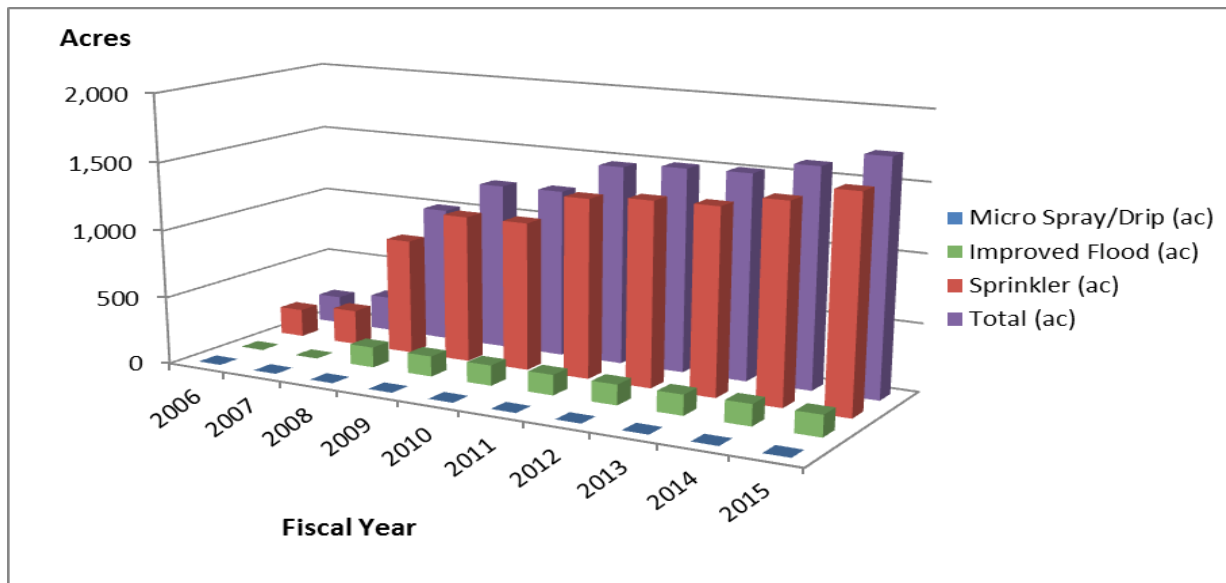
IRRIGATION SYSTEMS APPLIED (acres)	FY 2015	CUMULATIVE
Sprinkler	0	1,854
Improved Surface System	0	889
Micro-Spray/Drip System	5	5
TOTAL	5	2,748

Graph 3 and sub-set table display the cumulative acres of the various irrigation improvements in the Mancos Valley Unit. The Mancos Valley Unit has a mix of field sizes although many are small and somewhat irregular shape. Typically the areas with larger and more uniform field sizes are where sprinkler systems are becoming more popular, however many of the areas with the relatively small and sometimes irregular field sizes make the installation of field sprinkler systems problematic.

If delivery systems are also improved, in many locations there is the opportunity to generate gravity pressure for sprinklers. However many of the areas with direct diversions or in areas where the delivery systems have not been piped limit the opportunity to build gravity pressure through pipeline delivery systems, so the sprinkler systems in this area typically require some type of pumped pressure to operate. The ease of operation and uniformity of application make sprinklers a desirable option for many irrigators, although if the installation includes a regulating pond, pump installation, and the associated energy and maintenance costs, it complicates the decision and increases both the installation and operating costs for the system.

In the project area the deep percolation reduction and subsequent salinity control is typically about 50 to 60% reduction for a well-managed improved flood system, about 75 to 85% reduction for a well-managed sprinkler system, and about 85 to 95% reduction for a well-managed drip or micro-spray system.

Graph 4 – Silt Unit Cumulative Irrigation Systems Installed



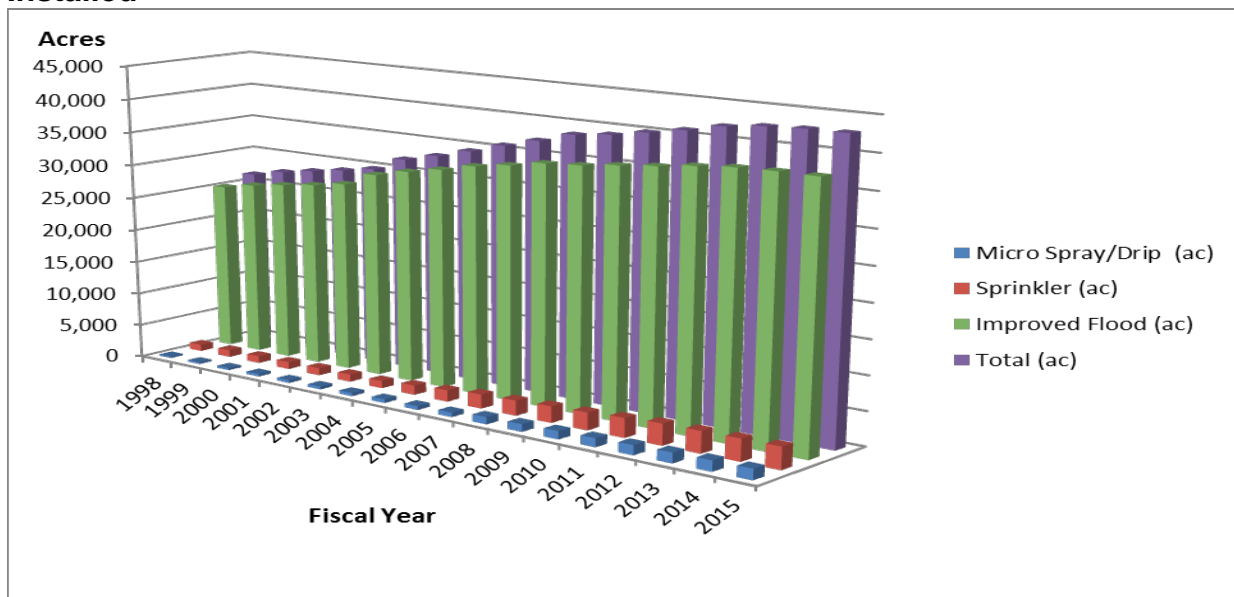
IRRIGATION SYSTEMS APPLIED (acres)	FY 2015	CUMULATIVE
Sprinkler	109	1,555
Improved Surface System	0	157
Micro-Spray/Drip System	0	0
TOTAL	109	1,712

Graph 4 and sub-set table display the cumulative acres of the various irrigation improvements in the Silt Unit.

The Silt Unit typically has some areas with larger and more uniform field sizes where sprinkler system are popular, however many areas have relatively small and sometimes irregular field sizes that make the installation of field sprinkler systems problematic. The ease of operation and uniformity of application make sprinklers a desirable option for many irrigators although the lack of piped and pressurized delivery systems and the small field sizes may tend to discourage much additional adoption of the larger sideroll sprinklers.

In the project area the deep percolation reduction and subsequent salinity control is typically about 50 to 60% reduction for a well-managed improved flood system, about 75 to 85% reduction for a well-managed sprinkler system, and about 85 to 95% reduction for a well-managed drip or micro-spray system.

Graph 5 – Grand Valley Unit Completed Project Cumulative Irrigation Systems Installed



IRRIGATION SYSTEMS APPLIED (acres)	FY 2015	CUMULATIVE
Sprinkler	14	3,246
Improved Surface System	3	38,015
Micro-Spray/Drip System	24	1,599
TOTAL	41	42,860

Note: The Grand Valley Unit was a designated salinity control project area from FY1979 through FY 2012. The on-farm salinity control work in the unit is considered to be substantially complete, although irrigation improvement projects in the unit are still eligible for designated EQIP salinity dollars through the Out-of-Project Tier 2 Salinity Control. To maintain project tracking continuity, the Grand Valley Tier 2 salinity control progress will continue to be reported as an addition to the original salinity control project tables.

Graph 5 and sub-set table display the cumulative acres of the various irrigation improvements in the former Grand Valley Unit. The earliest micro-spray systems were installed in the 1980's, and there has been a relatively consistent, although comparatively small acreage of micro-spray irrigation systems installed through-out the life of the project.

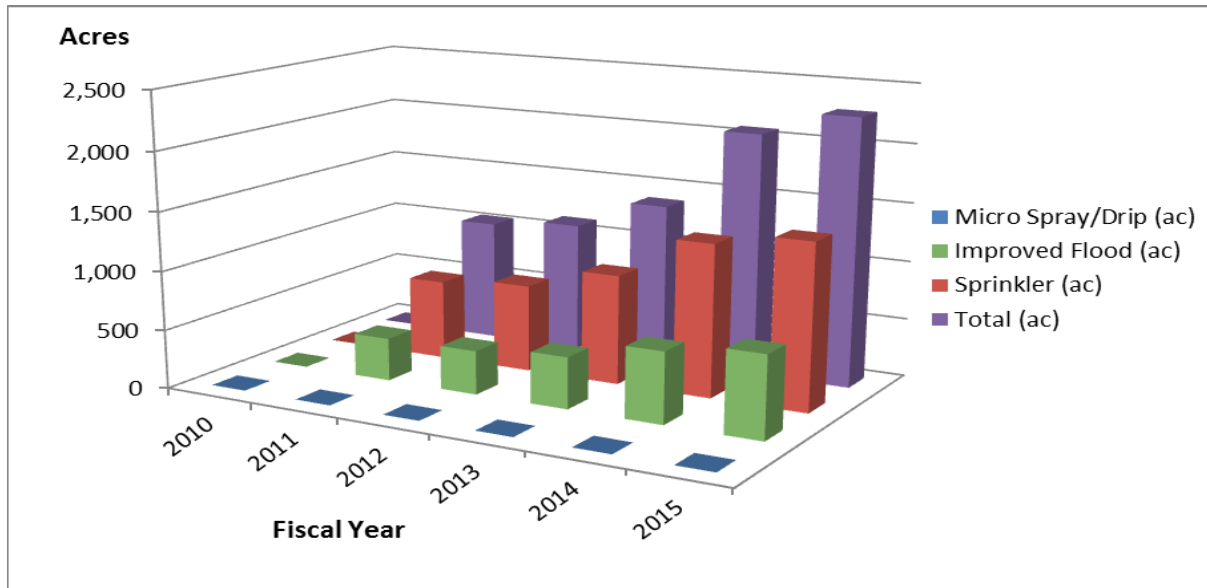
The Grand Valley area typically has somewhat small field sizes where sprinkler systems have not been a popular choice. In addition, the relatively flat topography in the portions of the project area with the larger field sizes, limits the opportunity to build gravity pressure through pipeline delivery systems so the sprinkler systems in this area typically require some type of pumped pressure to operate. Regardless, there has been a small increase in the number of sprinkler systems installed on some of the larger and more uniform fields in more recent years. The ease of operation and uniformity of application make sprinklers a desirable option for many irrigators, although when the installation includes a regulating pond, pump installation, and the associated energy and maintenance costs, it complicates the decision and increases both the installation and operating costs for the system.

The number of vineyard and orchard operations in the Grand Valley area account for most of the drip and micro-spray systems installed, and although they represent a significant number of systems, the fields are typically small and do not account for a large acreage. The systems perform very well from an irrigation application efficiency perspective, but are often relatively expensive on a per acre treatment basis and typically are more attractive for the high value crops.

The application to upgrade some of the improved flood irrigation systems to some type of high technology high-efficiency irrigation system will likely continue in Grand Valley and will be much of the work done as EQIP Salinity Tier 2 projects.

In the Grand Valley area the deep percolation reduction and subsequent salinity control is typically about 50 to 60% reduction for a well-managed improved flood system, about 75 to 85% reduction for a well-managed sprinkler system, and about 85 to 95% reduction for a well-managed drip or micro-spray system.

Graph 6 – Out of Project Area Tier 2 Irrigation Improvements Cumulative Irrigation Systems Installed



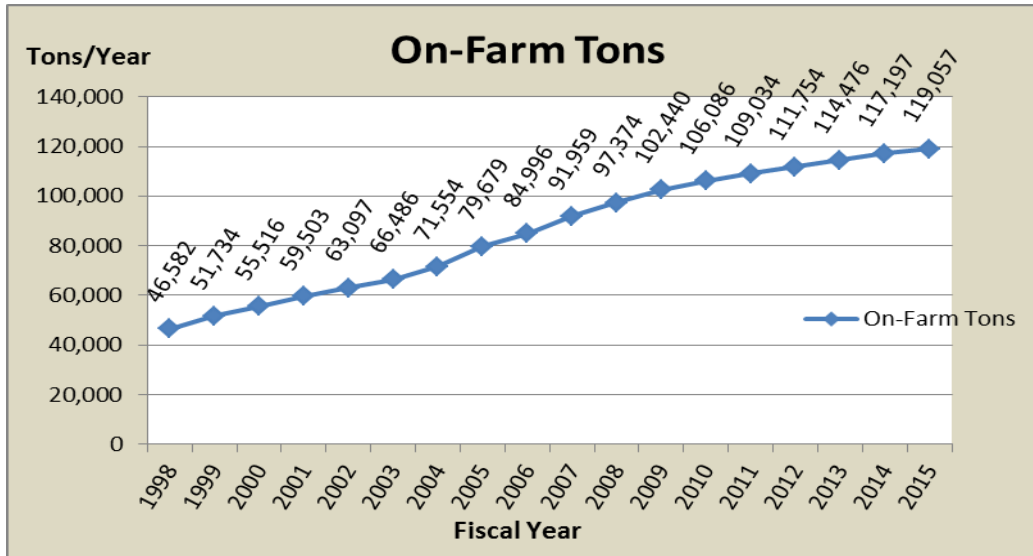
IRRIGATION SYSTEMS APPLIED (acres)	FY 2015	CUMULATIVE
Sprinkler	111	1,412
Improved Surface System	96	699
Micro-Spray/Drip System	0	0
TOTAL	207	2,111

Graph 6 and sub-set table display the cumulative acres of the various irrigation improvements in the Colorado Out-of-Project Area Tier 2 Salinity Control in the Greater Colorado River Basin.

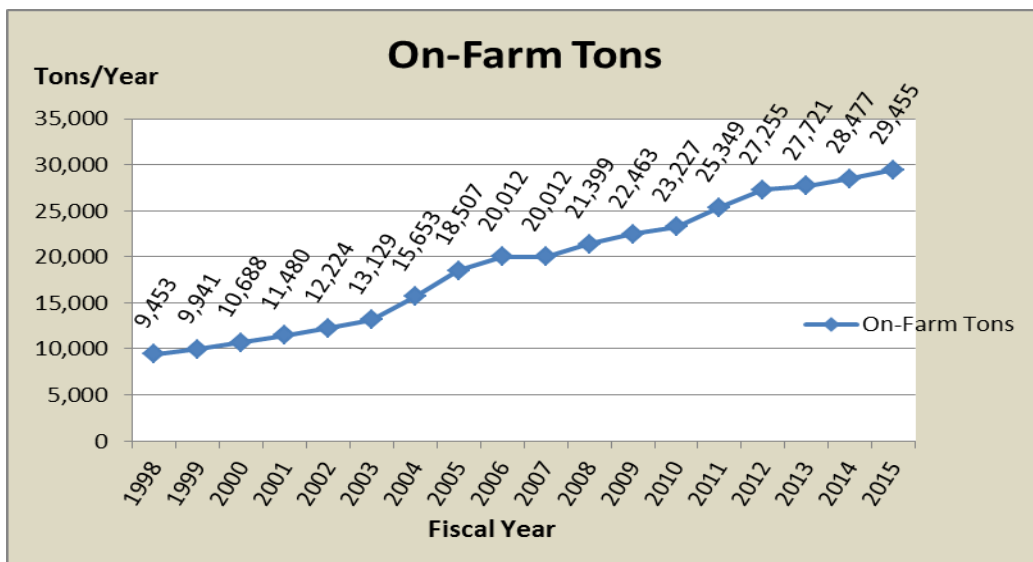
The Out-of-Project Area represents a diverse set of irrigated areas with a combination of small and larger land units. The trend seems to indicate that sprinklers are often the irrigation improvement being selected since they typically offer a more automation and are a less labor intensive irrigation distribution system. Sprinkler systems also offer more built-in management with higher application efficiencies and typically provide a better net reduction in deep percolation, so they are one of the best options for salinity control. The out of project area irrigation improvements projects are providing additional salinity control at a competitive cost per ton.

Colorado Salinity Control Unit On-Farm Salt Load Reduction

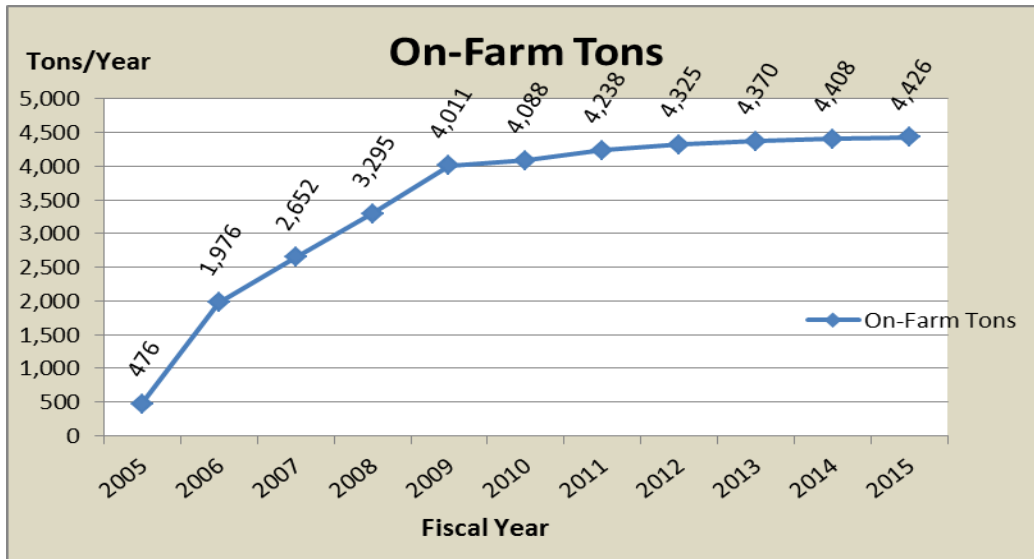
Graph 7– Lower Gunnison Unit Cumulative On-Farm Salinity Load Reduced



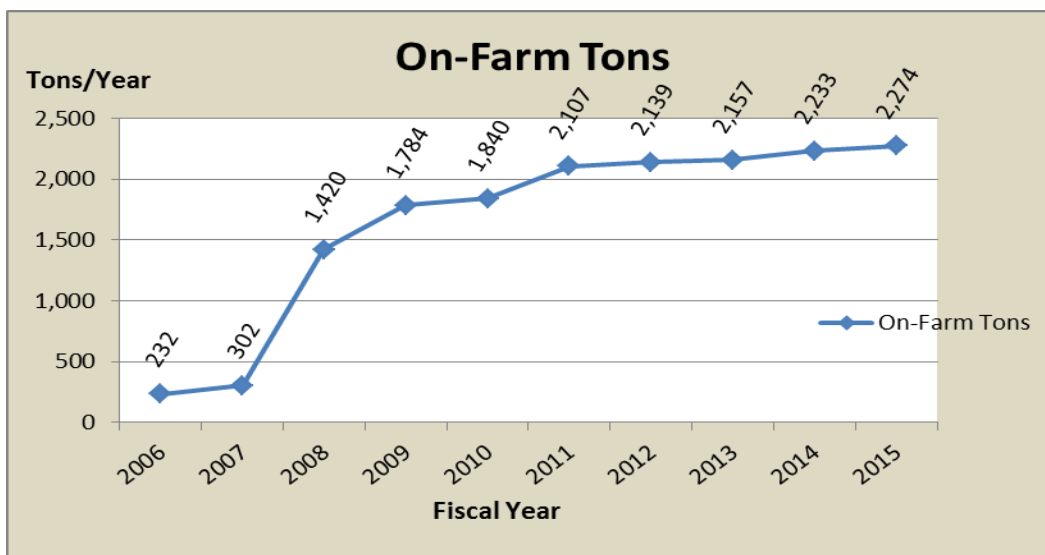
Graph 8 – McElmo Creek Unit Cumulative On-Farm Salinity Load Reduced



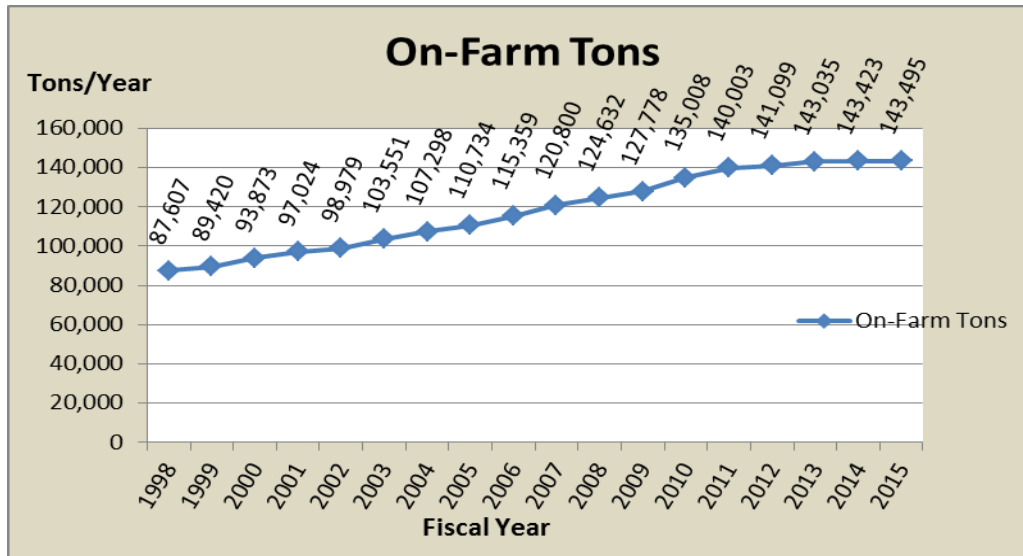
Graph 9 – Mancos Valley Unit Cumulative On-Farm Salinity Load Reduced



Graph 10 – Silt Unit Cumulative On-Farm Salinity Load Reduced

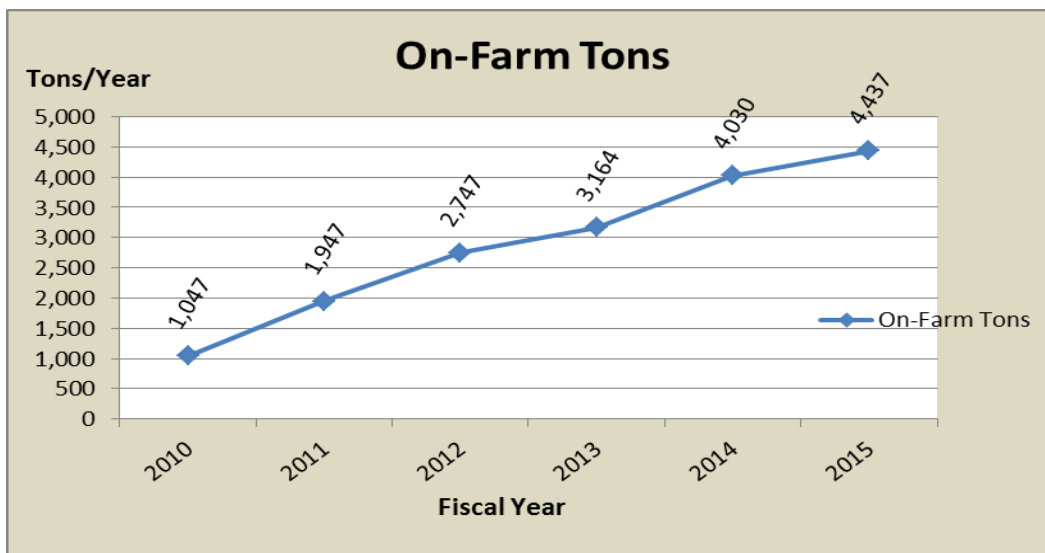


Graph 11 – Grand Valley Unit Completed Cumulative On-Farm Salinity Reduced, Includes FY 2013 – FY 2015 Grand Valley EQIP as a Completed Project Unit



Note: The Grand Valley Unit was a designated salinity control project area from FY 1979 through FY 2012. The on-farm salinity control work in the unit is considered to be substantially complete, although irrigation improvement projects in the unit are still eligible for designated EQIP salinity dollars through the Out-of-Project Tier 2 Salinity Control. To maintain project tracking continuity, the Grand Valley Tier 2 salinity control progress will continue to be reported as an addition to the original salinity control project tables.

Graph 12 - Out-of-Project Area Tier 2 Salinity Cumulative Tons Salinity Reduced



US Geological Survey Trend Analysis

Table 2 - USGS Trend Analysis and Agency Reported Salinity Reduction

Unit	Trend Years	NRCS Project Start Year	NRCS Reported Reduction (tons/year) ^{/1}	BOR Reported Reduction (tons/year) ^{/1}	Total Predicted Reduction (tons/year) ^{/1}	Measured Reduction (tons/year)	Unclaimed Reduction (tons/year)
Grand Valley	1986 - 2003	1979	103,551	122,300	225,851	322,200	96,349
Lower Gunnison	1986 - 2003	1988	66,486	43,675	110,161	201,600	91,439
McElmo	1978 - 2006	1989	20,012	32,000	52,012	90,450 ^{/2}	38,438

^{/1} The ton/year number is the cumulative salt load reduction reported by the USDI-USBR and USDA-NRCS for the final trend analysis year for each study area, either 2003 or 2006

^{/2} Includes a measured ton/year reduction plus projected ton/year salinity increase due to the introduction of the Dolores Project Water

U.S. Geological Survey (USGS) completed two salinity trend analysis reports for the gaging stations that include salt loading trends below three of the Colorado River Salinity Control Projects, and their analysis covered part of the salinity control implementation period. The measured salinity trends in the river exceeded the salinity control reductions claimed by the participating agencies for all three locations for the years represented. Certainly other management and land-use changes contributed to either increases and/or reductions to salt loading in the river, however the USGS trend analysis was corrected to account for the salt variations with changes in annual flow, and is intended to represent a flow adjusted annual change in salinity loading trends. The fact the trend reductions exceed the predicted loading reductions from the program helps support the irrigation improvement work is significantly reducing the annual load contribution from irrigation, and possibly the amount of improvement is somewhat greater than predicted.

Table 2 References

“Salinity Trends in the Upper Colorado River Basin Upstream from the Grand Valley Salinity Control Unit, Colorado, 1986—2003”, USGS Scientific Investigations Report 2007-5288, Kenneth J. Leib and Nancy J. Bauch, 2008.

“Characterization of Hydrology and Salinity in the Dolores Project Area, McElmo Creek Region, Southwest Colorado, Water Years 1978-2006”, USGS Scientific Investigations Report 2010-5218, Rodney J. Richards and Kenneth J. Leib, 2011.

USDA-NRCS Salt Load Reductions are from the NRCS Mason Reports and the NRCS Monitoring and Evaluation Reports for each salinity control unit for the years represented.

USDI-USBR Reported Salt Load Reductions from personal communication with Nicholas Williams, Environmental Engineer, US Bureau of Reclamation, Salt Lake City, Utah.

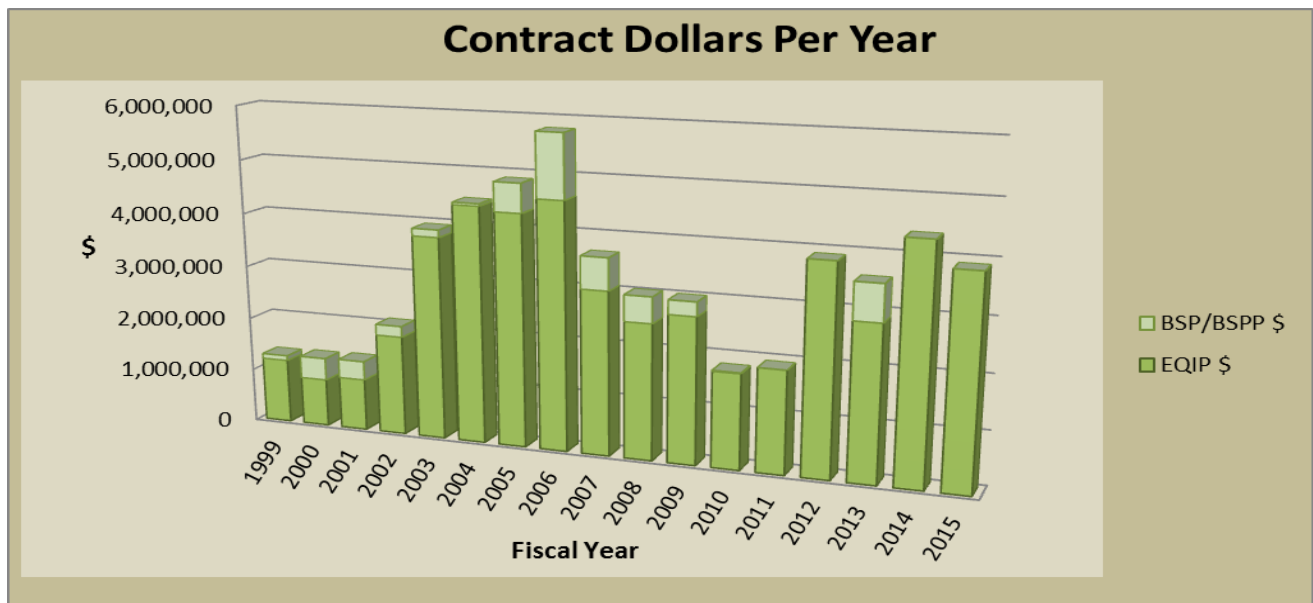
Colorado NRCS On-Farm Salinity Control Funding

Table 3 - On-Farm Programs for Funding Salinity Control

Program	Fiscal Years
USDA Salinity Control Program (USDA-CP)	1979 - 1986
Colorado River Salinity Control Program (CRSCP)	1987 -1995
Interim Environmental Quality Incentives Program (IEQIP)	1996
Environmental Quality Incentives Program EQIP	1997 - 2015
Colorado River Basin States Program (BSP/BSPP)	1998 - 2015

Note: The USDA NRCS utilized various funding programs available for Colorado River Salinity Control on-farm irrigation improvement activities. See pages 95-97 for additional information about programs and authorities.

Graph 13 – Lower Gunnison Unit Contract Dollars by Program



Note: The funding programs represented include the NRCS Environmental Quality Incentives Program (EQIP), and the Bureau of Reclamation funded Basin States Program (BSP, formerly known as the Basin States Parallel Program BSPP).

Graph 13 displays the Environmental Quality Incentive Program (EQIP) and Basin States Program (BSP/BSPP) contract dollars per year from FY 1999 through FY 2015. The amounts varied significantly on an annual basis in part due to program allocations, the local economy, the cost of the installed systems, and the landowner’s ability to cover their portion of the cost. The public funding is typically intended to cover approximately 75 percent of the installation cost,

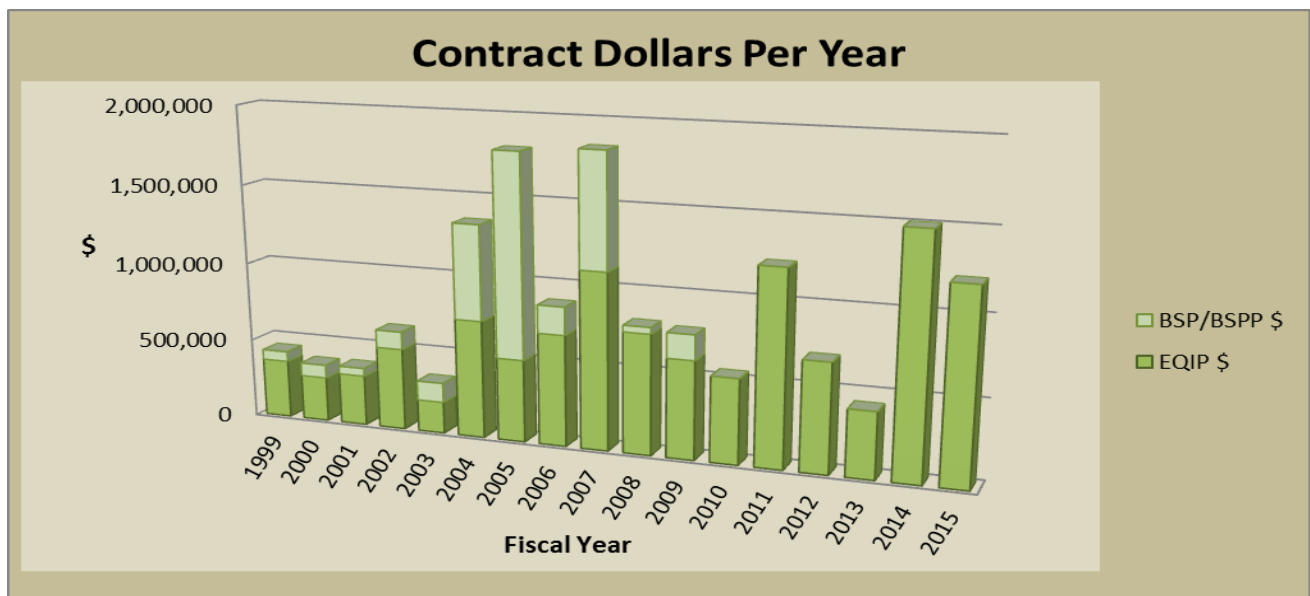
however many of the peripheral costs such as getting power to the site, possible non-irrigation equipment changes, additional management costs, the cost of learning and adapting new technologies, etc. are paid by the landowner and are typically not eligible for public cost-share assistance.

Although the numbers fell within some of the previous annual contract dollar ranges, FY 2010 and FY 2011 were relatively low contract years. The recession, low hay prices, and higher input costs made farmers apprehensive about signing contracts for irrigation improvements. There was still the opportunity to make significant irrigation improvements and outreach efforts were increased. The number of contracts was down by about two thirds during this period as a result of the economic recession. Due to the increased outreach and improving local agricultural economy, FY 2012 saw a significant increase in the number and dollar amount of contract applications funded, and there was similar interest for FY 2013, and continued through FY 2014 and FY 2015.

In addition, the re-funding of the Basin States Program should allow for additional future contracts with landowner's who may not be EQIP eligible, and it was assumed the amount of both EQIP and BSP contracts would continue to increase¹ as the local economy improved.

¹ Note: The FY 2012 EQIP salinity sign-up increased significantly from FY 2010 and FY 2011, however the FY2013 payment schedules changed significantly at the national level, and the changes to payment schedule did not appear to affect the rate of sign-up and participation for the 2013 fiscal year.

Graph 14 – McElmo Creek Unit Contract Dollars by Program



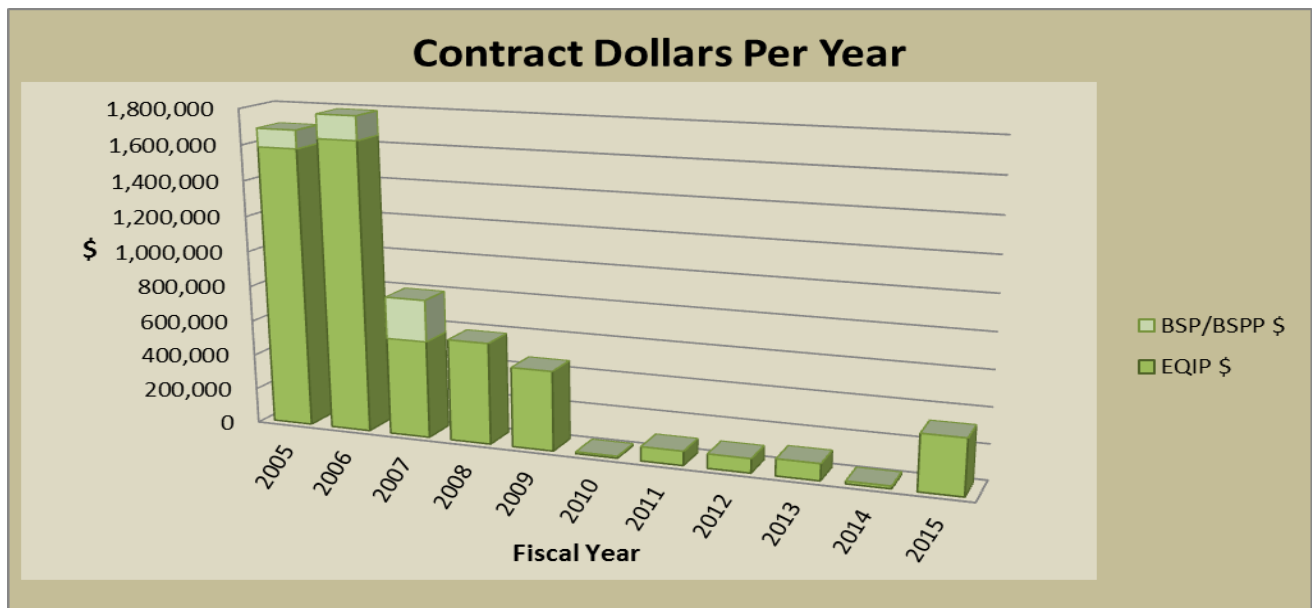
Note: The funding programs represented include the NRCS Environmental Quality Incentives Program (EQIP), and the Bureau of Reclamation funded Basin States Program (BSP, formerly known as the Basin States Parallel Program BSPP).

Graph 14 displays the Environmental Quality Incentive Program (EQIP) and Basin States Program (BSP/BSPP) contract dollars per year from FY 1999 through FY 2015. The amounts varied significantly on an annual basis in part due to program allocations, the local economy, the cost of the installed systems, and the landowner's ability to cover their portion of the cost. The public funding is typically intended to cover approximately 75 percent of the installation cost, however many of the peripheral costs such as getting power to the site, possible non-irrigation equipment changes, additional management costs, the cost of learning and adapting new technologies, etc. are paid by the landowner and are typically not eligible for public cost-share.

Although the numbers fell within some of the previous annual contract dollar ranges, FY 2010 was a relatively low contract year compared to some of the previous years. The recession, low hay prices, and higher input costs made farmers apprehensive about signing contracts for irrigation improvements. The number of contracts was down by about two thirds during the FY 2010 period as a result of the recession. Since there was still the opportunity to make significant irrigation improvements, outreach efforts were increased and there was a significant increase in contracts for FY 2011.

For FY 2012 and FY 2013, although the numbers of contracts were similar to the number of contracts processed in FY 2011, the average contract was smaller in size and obligated fewer contract dollars. However FY 2014 and FY 2015 showed a significant increase in both the number of contracts and contract dollars obligated.

Graph 15 – Mancos Valley Unit Contract Dollars by Program

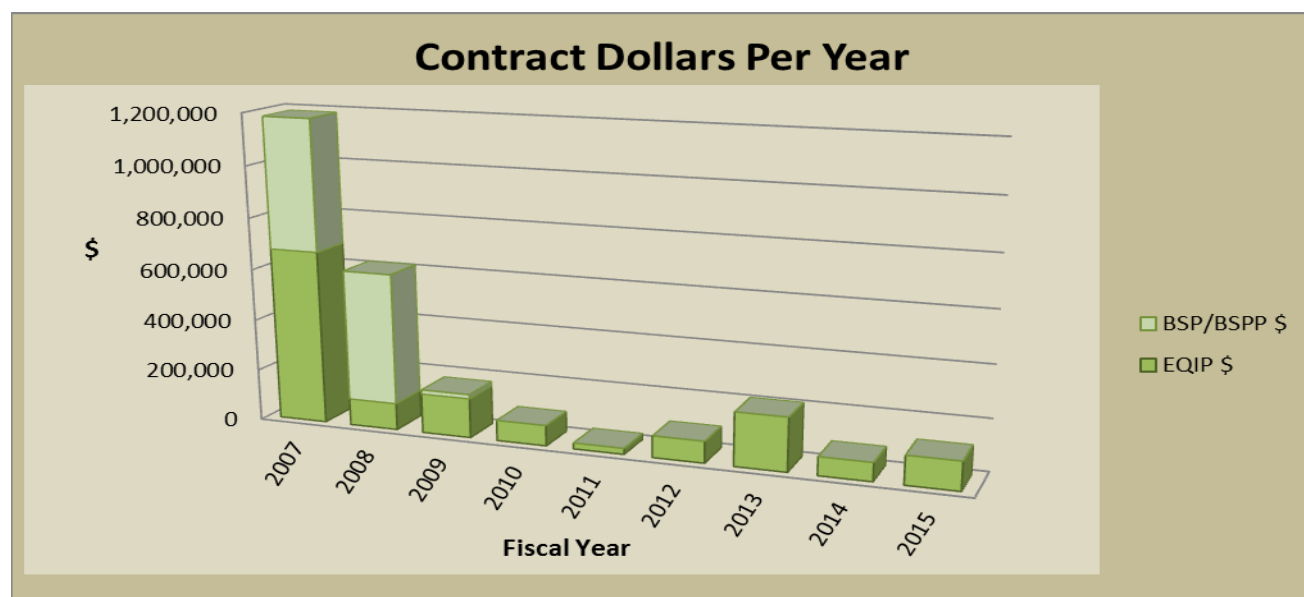


Note: The funding programs represented include the NRCS Environmental Quality Incentives Program (EQIP), and the Bureau of Reclamation funded Basin States Program (BSP, formerly known as the Basin States Parallel Program BSPP).

Graph 15 displays the Environmental Quality Incentive Program (EQIP) and Basin States Program (BSP/BSPP) contract dollars per year from FY 1999 through FY 2015. The amounts varied significantly on an annual basis in part due to program allocations, the local economy, the cost of the installed systems, and the landowner's ability to cover their portion of the cost. The public funding is typically intended to cover approximately 75 percent of the installation cost, however many of the peripheral costs such as getting power to the site, possible non-irrigation equipment changes, additional management costs, the cost of learning and adapting new technologies, etc. are paid by the landowner and are typically not eligible for public cost-share. The FY 2010 through FY 2013 Fiscal Years were relatively low contract years. In FY 2010 the recession, low hay prices, and higher input costs made farmers apprehensive about signing contracts for irrigation improvements. There was still the opportunity to make significant irrigation improvements and outreach efforts were increased. During FY 2010 the number of contracts was down by about two thirds as a result of concerns about the local economy. FY 2011 and FY 2012 had a slight increase in the amount of contract dollars, and FY 2013 had an additional slight increase in contract dollars. However FY 2014 was a very low signup year with a slight increase in FY 2015.

There is a concern locally that the future on farm program participation may be somewhat contingent on the development of more group pipeline projects to generate gravity pressure to make additional sprinkler systems desirable. The local understanding is without more group delivery projects, the rate of implementation and number of contract applications to complete additional on-farm projects will remain low, and the Mancos Valley Unit will probably not meet the planned goals for acres treated and salinity load reduction. It is recommended local assessments be conducted to determine the feasibility and cost-effectiveness of the potential group projects and to adjust project plan goals as appropriate.

Graph 16 – Silt Unit Contract Dollars by Program



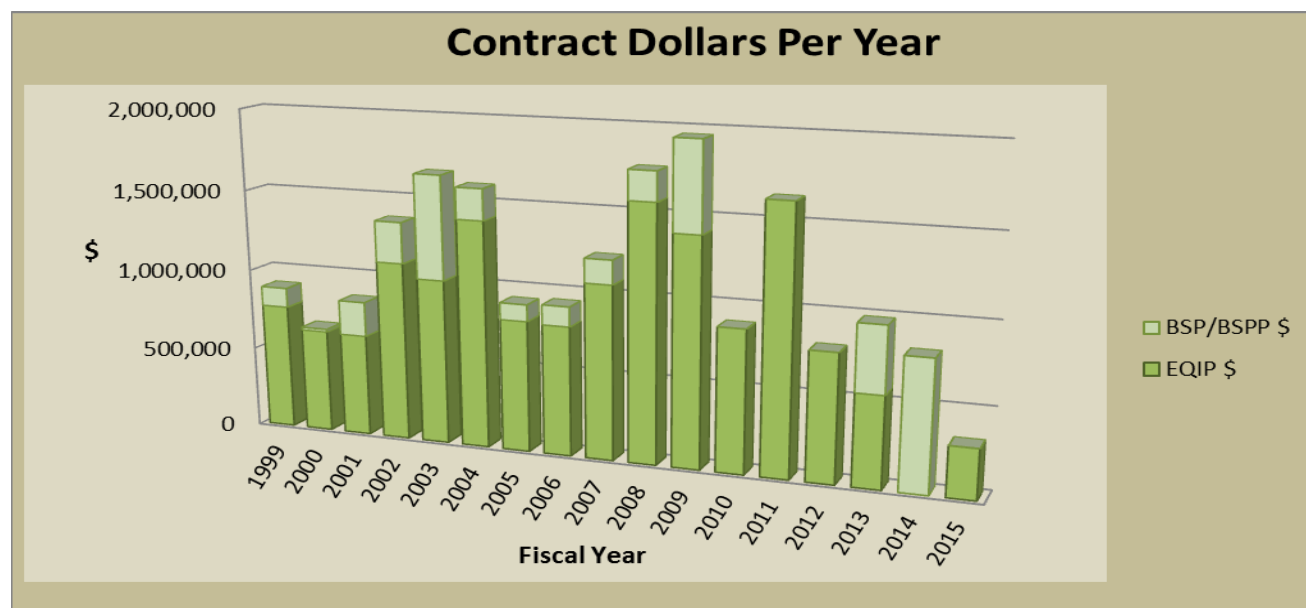
Note: The funding programs represented include the NRCS Environmental Quality Incentives Program (EQIP), and the Bureau of Reclamation funded Basin States Program (BSP, formerly known as the Basin States Parallel Program BSPP).

Graph 16 displays the Environmental Quality Incentive Program (EQIP) and Basin States Program (BSP/BSPP) contract dollars per year from FY 1999 through FY 2015. The amounts varied significantly on an annual basis in part due to program allocations, the local economy, the cost of the installed systems, and the landowner's ability to cover their portion of the cost. The public funding is typically intended to cover approximately 75 percent of the installation cost, however many of the peripheral costs such as getting power to the site, possible non-irrigation equipment changes, additional management costs, the cost of learning and adapting new technologies, etc. are paid by the landowner and are typically not eligible for public cost-share.

Although the numbers fell within some of the previous annual contract dollar ranges, FY 2010, FY 2011, and FY 2012 were relatively low contract years, although FY 2012 showed an increase from the previous two years. FY 2013 showed an increase in the dollars allocated due to one large contract. During FY 2010 and FY 2011, the recession, low hay prices, and higher input costs made farmers apprehensive about signing contracts for irrigation improvements.

Due to continued low signup in both FY 2013 and FY 2014 the local staff conducted a field assessment and GIS analysis of the irrigation systems within the project area. When the data collection is complete it is recommended additional analysis is needed to determine if there are still significant areas needing irrigation improvements, or whether the original project goals need to be adjusted to reflect current conditions.

Graph 17 – Grand Valley Unit Completed Project Contract Dollars by Program



Note: The Grand Valley Unit funded a BSP salinity wildlife contract in November 2013 (1st Quarter FY 2014) for \$804,415 to develop habitat on 490.0 acres of salinity wildlife habitat replacement on Colorado Parks and Wildlife land that was not included in the FY 2013 contract dollars table. Since the November contract occurred in the first quarter of FY 2014, it is included as the FY 2014 BSP/BSPP \$ amount.

Note: The funding programs represented include the NRCS Environmental Quality Incentives Program (EQIP), and the Bureau of Reclamation funded Basin States Program (BSP, formerly known as the Basin States Parallel Program BSPP).

Graph 17 displays the Environmental Quality Incentive Program (EQIP) and Basin States Program (BSP/BSPP) contract dollars per year from FY1999 through FY 2015. The amounts varied significantly on an annual basis in part due to program allocations, the local economy, the cost of the installed systems, and the landowner's ability to cover their portion of the cost. The public funding is typically intended to cover approximately 75 percent of the installation cost, however many of the peripheral costs such as getting power to the site, possible non-irrigation equipment changes, additional management costs, the cost of learning and adapting new technologies, etc. are paid by the landowner and typically are not eligible for public cost-share.

Although the numbers fell within some of the previous annual contract dollar ranges, FY 2010 was a relatively low contract year. The recession, low hay prices, and higher input costs made farmers apprehensive about signing contracts for irrigation improvements. There was an on-going opportunity to make significant irrigation improvements and outreach efforts were increased. The number of contracts during this period was down by about two thirds as a result of the recession. It is assumed the increased outreach and publicity announcing the formal conclusion of the on-farm portion of the salinity control program stimulated the increase in interest in FY 2011. For FY 2012 and FY 2013 the amount of dollars obligated into salinity control contract has remained relatively high.

Based on a 2011 field inventory of unimproved irrigation systems in Grand, the on-farm portion of the Grand Valley project was considered essentially complete in FY 2012. The EQIP salinity funding remained high through FY 2013, and although there was still local interest in making additional irrigation system improvements in the Grand Valley Unit - Completed Project Area there were no new FY 2014 EQIP salinity control contracts approved for the project area due to increased interest and additional signups in the Lower Gunnison and McElmo Creek units. However in FY 2015 funds were made available for a few additional on-farm irrigation improvement projects in the Grand Valley Unit, and local interest in making irrigation system improvement is expected to continue at this rate for the foreseeable future.

For future irrigation improvement funding, the re-funding of the Basin States Program will allow for additional contracts with landowner's who are not EQIP eligible, and it is assumed the requests for both EQIP and BSP contracts will stay relatively constant for the near future.

Graph 18 - Out-of-Project Area Tier 2 Salinity Control EQIP Contracts



Note: The Out-of-Project Area Tier 2 Salinity Control is currently not eligible for BSP/BSPP project funds since the Tier 2 projects are not in a formally designated salinity control unit.

As displayed in Graph 18 the FY 2015 funding for the Out-Of-Project Area Tier 2 salinity was very low. Additional cost-effective Tier 2 irrigation improvement projects were proposed that did not receive funding, so the Tier two projects remains a cost-effective option to fully utilize the salinity control funds as interest in the established project areas fluctuates.

Salinity Contract Summary

The trend in the all of the Colorado Salinity Control Units is to continue the installation of new systems, and to upgrade and improve some of the older flood systems. Improvements to technology and design offer additional salinity reduction benefits by upgrading the more primitive flood systems to pipeline gated pipe with or without surge irrigation valves, or in some cases change from improved flood irrigation to either sprinkler or micro-spray/drip irrigation. The salinity reductions claimed in these situations are based on the incremental improvement offered by making the change from the current system to the improved system. Additionally the higher levels of irrigation system improvement typically have more management built into the system and the level of application efficiency typically has a higher assured performance.

The economic value to the community and adjacent states is significant. The projects offer a downstream benefit from reduced damages through the amortized cost per ton that typically covers the public cost of installation. In addition the landowners receive economic benefits from improved crop quality, better utilization of fertilizers, reduced irrigation labor costs, etc. The local community benefits though the economic turnover in the area from the public cost-share funds, the improved crop qualities, agricultural sustainability, etc.

Colorado Salinity Control Units FY 2015 Highlights

Lower Gunnison Unit – Delta and Montrose Field Offices - FY 2015 Outreach and Irrigation Water Management (IWM) Highlights

Since the Colorado River Basin salinity program's start in the Lower Gunnison Unit in FY 1988, the Natural Resources Conservation Service (NRCS) in partnership with the local Conservation Districts have been applying improved irrigation systems and practices with cooperators under the guidance of the Colorado River Salinity Control Program (CRSCP). Funding for the CRSCP has been primarily possible through the Environmental Quality Incentives Program (EQIP) and the Basin States Program (BSP). Within the past few years the former Basin States Parallel Program (BSPP) transitioned to the new Basin States Program (BSP). The transition gradually shifted the focus from on farm improved surface delivery systems to that of piping large scale main lateral off farm canal and ditch delivery systems. This focus shift has created a great deal of interest from group and irrigation companies in future participation in BSP. Also, there is a greater trend toward conversion of existing improved surface systems to highly efficient, advanced irrigation technology (AIT) and in particular Center Pivot sprinkler systems. Currently, this trend is primarily occurring in Delta County of the project area. With the advent of the new BSP and piping main stem delivery systems the conversion of existing improved surface on farm systems to AIT is expected to increase making it possible for irrigators to tap into pressurized gravity flow delivery systems.

Lower Gunnison Unit – Delta and Montrose Field Offices – Salinity Outreach Activities

- October 2014 – The Irrigation Water Management Specialist took part in planning and organizing a field day at the Hotchkiss CSU Pasture Demo plot for 60 producers. This field day focused on the establishment and management of grass pasture fields. IWM Specialist also spoke during the field day about irrigation practices and efficiency.
- October 2014 – IWM Specialist participated in the planning and organization of the 2014 Fall Cover Crop Tour in collaboration with the IWM Specialist from the Montrose Field Office. Tour was well attended by 60+ producers and highlighted benefits of healthier soil, including higher water holding capacities in healthier soils and less runoff/deep percolation in fields with healthier soil due to better infiltration and a reduction in the overall water applied.
- October 2014 - IWM specialist and soil scientist spoke on the local radio station to promote using cover crops and to announce the cover crop tour. This announcement stressed the benefits of producers growing cover crops, especially with improved irrigation systems, the benefits of upgrading their irrigation systems, and improving IWM.
- November 2014 – District hosted informational meeting about the upcoming Bureau of Reclamation FOA for ditch and canal piping. Meeting was attended by 20 canal and ditch company representatives and focused on available opportunities for ditch and canal companies to receive funding assistance for pre-engineering in preparation for the FOA.

- November 2014 - Many local producers, other landowners in the lower Gunnison area, government agency personnel, and others participated in this cover crop tour which looked at successful cover crop trials and efforts happening in the two county area, and the tour also demonstrated the improved irrigation systems and improved IWM associated with this conservation effort.
- November 2014 - IWM specialist submitted a number of articles via email to all folks involved in the local soil health movement in the two county area. These articles highlighted some of the history of the soil health movement in the area, the benefits of improving soil health, improving irrigation systems, upgrading to more efficient systems, and improving IWM.
- October – December 2014 – District personnel gave presentations about erosion and river ecology using the Riparian Trailer for 70 students within the Delta Conservation District, participated as judges at a local middle school science fair for 25 students and gave presentations and guidance to local 6th grade students for the annual CACD poster contest. These efforts are undertaken to encourage young students to become water wise producers in the future.
- January 2015 - The Delta Conservation District sponsored the local Soil Health Conference in Delta Colorado. District Employees assisted with planning for conference, management of conference and setup of conference. Nationally acclaimed speakers were brought to the conference, which was attended by approximately 150 producers.
- January 2015 - IWM specialist coordinated speakers for 6 different workshops at the Food and farm Forum. Some of the workshops/ presentations included outreach information on improved irrigation practices and salinity EQIP program opportunities.
- January 2015 - IWM specialist coordinated speakers for 10 Soil Health topics at the 5th annual Soil Health Conference in Delta. Some of the workshops and discussions included information on improved irrigation practices and salinity EQIP program opportunities.
- January and February 2015 – The Delta Conservation District sponsored two invasive weed management workshops in Delta and Hotchkiss. Attendees were taught to properly identify weeds to make treatment more effective. Specialists spoke about the treatment of invasive plants through biological and chemical control methods. These meetings were attended by 38 producers.
- February 2015 – The Delta Conservation District collaborated with local groups to sponsor an Irrigation Efficiency Workshop. Several local experts talked about the water use and efficiency in the lower Gunnison. The Delta IWM Specialist spoke about conservation district efforts to assist producers with efficiency upgrades. 40 local landowners attended.
- April 2015 – The Biologist wrote an article for the Shavano Conservation District newsletter about the local field office efforts on soil health activities, irrigation water management, and the technical assistance available through the field office and conservation district.
- April & May 2015 – The Delta Conservation District collaborated with other conservation partners to present hands-on educational activities at two separate venues reaching approximately 560 students.
- May 2015 – The Delta Conservation District and NRCS in partnership with the Colorado State University Small Acreage Management Program, to plan and conduct a pasture management during drought workshop with approximately 15 people in attendance. Ironically the drought workshop attendance was relatively low due to heavy rain.

- May 2015 – The Delta Conservation District worked with the Lower Gunnison Salinity Coordinator to create a set of ArcGIS maps for and information meeting about the upcoming FOA. The meeting included representatives from approximately 30 different irrigation ditch groups.
- June 2015 – The Delta Conservation District and State of Colorado held a meeting for about 45 people on how to develop a better FOA project.
- August 2015 - The Delta Conservation District conducted a resource concern survey with local producers. The survey was presented via email to local landowners. 65 producers responded to the questionnaire over the course of several weeks. The end result was a broad ranging snapshot of local resource concerns ranging from environmental degradation to water supply and drought worries. This data was presented in several local forums and was provided to the state NRCS in response to their attempts to fine tune their resource priorities in localized areas
- August 2015 – The Shavano CD IWM Specialist helped teach 4 Soil Scientists and two Soil Conservationists from across Colorado how to set up and take salt readings from the Dual-EM unit with the new GPS unit installed on a field near Mack, Colorado.
- August 2015 – The Shavano CD IWM Specialist set up and chaired a Soil Health meeting in Delta with 6 producers and 6 agency people in planning the 2016 Soil Health Conference. The presentation included pictures from 6 farms that have planted cover crops in Montrose field office demo trials.
- August 2015 - The Delta Conservation District Hosted the 2015 Gunnison-Dolores Watershed Tour. 25 landowners from throughout the watershed attended the meeting at the American Legion in Paonia Colorado. The watershed Districts presented their accomplishments for the year and watershed officers and representatives were elected for the coming year. In the afternoon the participants took a tour of a local orchard that has deployed a small hydro power station and a local ranch where irrigation efficiency technologies have been deployed.
- September 2015 – The Shavano CD IWM Specialist attended a steering committee meeting with Food and Farm Forum meeting with 6 other steering committee members to start reaching out to speakers and plan the 2016 Food and Farm Forum meeting.
- September 2015 – The Shavano CD IWM Specialist gave an IWM report at the Lower Gunnison Salinity Work Group meeting as a summary of the 2015 Irrigation Year-to-date to 24 other work group members and guests.
- September 2015 – The Shavano CD IWM Specialist gave a Soil Health Power Point to a local breakfast group.
- September 2015 – FO Soil Conservationist assisted the National NRCS Media Specialist with doing a video on the soil health initiative conservation practices on the David Harold farm. The video is intended to demonstrate the successful implementation of many types of irrigated crop soil health improvements and opportunities which support irrigation water management, crop production and crop quality, and help utilize limited water resources for water conservation and water quality improvements.
- July-September 2015 – The Delta IWM Specialist made 8 non-contract technical assistance visits to local producers, providing them with information and assistance in regards to irrigation techniques, system troubleshooting, scheduling irrigations, and soil health practices.

Lower Gunnison Unit - Delta and Montrose Field Offices - Irrigation Water Management (IWM)

The FY 2015 IWM program was initiated in early spring through contacts with producers having IWM scheduled in their salinity contracts on an incentive payment basis and working with them to establish an irrigation schedule using the irrigation tool-box work sheet. Factors such as irrigation system type, soils, crops, and available water were all taken into consideration. Soil moisture monitoring was evaluated in the field to establish a baseline for future management adjustments. In some situations the IWM Specialist would accompany the Conservation Planner in the field to accomplish this task. Producers were instructed on how and when to maintain records of their irrigation application rates and frequencies, so this data could be evaluated with soil moisture monitoring results and/or crop adjusted evapo-transpiration (ETc) rates in order to make necessary adjustments to achieve optimum irrigation application efficiencies. The higher irrigation application efficiencies were achieved in FY 2014 and FY 2015, using a list of more specific expectations for IWM certification, including better ETc documentation, ETc checkbook analysis as appropriate, Irrigation Tool Box water management analysis for each grower, and improved record keeping practices for each grower. This higher level of analysis and comparison of water needs compared with water applied is leading to a better understanding of the IWM principles of irrigation scheduling and application amounts from participating producers in the field.

Cooperation between the two field office IWM specialists continued throughout the 2015 irrigation season and will continue into the future. Due to differing types of crops, systems and conditions in the two offices, this cooperation allows for a more flexible and comprehensive IWM program in both offices.

Lower Gunnison Unit - Delta Field Office – FY 2015 Irrigation Water Management (IWM) Activities

The Delta Irrigation Water Management (IWM) Specialist made **118 visits** to assist contract recipients with the principles of Irrigation water management. This resulted in the certification of IWM practices for **32 contracts**. These 32 contracts represented **1,530 acres**, of which 1,100 acres were hay, 93 acres were pasture, 88 acres were row crops, and 249 acres were specialty crops. Producers with first year IWM contracts were also provided with soil moisture ball probe; **20 of these probes** were given away during the 2015 irrigation season during contract and CTA IWM visits. Throughout the 2015 season, the Delta IWM Specialist installed **11 Hanson Water Logger/Sensor units** and assisted producers with soil moisture monitoring to increase their crop yield and watering efficiency. The IWM specialist also assisted planning staff with collection of soil samples and tissue samples from many of the contract properties. IWM plans were developed for **12 new contracts** in the 2015 fiscal year.

In addition, the Delta IWM Specialist made **48 Conservation Technical Assistance (CTA)** visits to irrigators without salinity contracts. These irrigators either solicited management assistance directly through the field office or through other agricultural entities. During these CTA visits the Specialist provided irrigation system operation and maintenance assistance on their existing systems, and also discussed potential benefits/challenges with the current irrigation system as well as answering questions for producers interested in considering some of

the newer more efficient irrigation systems. The potential for improved IWM on these acres helps provide an additional unmeasured and unreported salinity control benefit in the Lower Gunnison project area. The Delta IWM specialist also provided assistance to **2 multi-user canal companies** with flow measurement and operation options as well as assisting **5 producers** with proper flow measurement and calibration of existing flow measurement devices.

During the 2015 irrigation season the Delta IWM Specialist participated in a number of educational projects including; assisting Teens on Farms and the local FFA with irrigation system operation on their kids market garden and working with Colorado State University (CSU) Extension on the soil moisture and water management data for the CSU Experimental Test Plot at the Hotchkiss Fair Grounds. The IWM Specialist continues to make presentations to various local groups about water, irrigation, drought, soil health and irrigation efficiency. Presentations were given to **over 500 students and producers** throughout FY 2015.

The Delta IWM specialist is also a contributor to the Uncompahgre Soil Health Steering Committee, and is helping to coordinate the 2016 Soil Health Conference in February as well as helping to coordinate the 2015 fall cover crop tour.

Lower Gunnison Unit - Montrose Field Office – FY 2015 Irrigation Water Management (IWM) Activities

The Montrose Irrigation Water Management (IWM) Specialist made **153 visits** to 53 active salinity contracts to assist contract recipients with the principles of Irrigation water management. This resulted in the certification of IWM practices in **45 contracts**. These 45 contracts represented **2,074 acres**, of which 1330 acres were hay, 111 acres were pasture, 543 acres were row crops, and 90 acres were specialty crops. Producers with contracts were also provided with **CSU Irrigation Record Books** containing irrigation facts and tips. Throughout the 2015 irrigation season, the Montrose IWM Specialist installed **6** Hanson Water Loggers/sensors, and also assisted planning staff with collection of **31 soil samples, clipped 5 cover crop plots** and performed Big Gun Catch can tests for **4 growers**. IWM plans were developed for **23 new contracts** in the 2015 fiscal year. The ET Water Balance program and the ERAMS CoAgMet internet site, along with the NRCS Toolbox program were used in developing these irrigation plans. The Conservation District staff assisted **33 other second year or past year contract recipients** to help with irrigation scheduling and IWM records and monitoring. Staff gave out **33 ball probes** built by Montrose FFA Chapter to irrigators to help growers irrigate more uniformly on their acreage.

In addition the Montrose IWM Specialist made **19 Conservation Technical Assistance (CTA)** visits to **15 non-salinity contract irrigators** to provide technical help and reference follow-up for producers referred by other agricultural entities. During these CTA visits the Specialist provided irrigation system operation and maintenance assistance on the existing system, and also discussed potential benefits/challenges with the current irrigation system and answered questions for producers interested in considering some of the newer more efficient irrigation systems. The potential for improved IWM on these acres helps provide an additional unmeasured and unreported salinity control benefit in the Lower Gunnison project area.

During FY 2015 the Montrose IWM Specialist served as Secretary for the Uncompahgre Soil Health Group and helped set up the 2015 Soil Health Conference. The 2015 Soil Health Conference had **158 attendees**.

Conservation District IWM staff served on the steering committee for the Food and Farm Forum and coordinated **8 sessions** for **230 people** at the Conference on January 10th, 2015. Staff has organized two demonstrations and two presentations on Minimum Till Equipment and Drip Irrigation Components for the Conference in Montrose on January 22- 23, 2015. CD IWM staff performed outreach to over **400 elementary students** at the Natural Resources Festival, Stewardship Week presentations and NACD Poster Contest presentations. He performed outreach to over **100 high school students** by providing presentations about Mancos shale derived soils and issues with selenium and salt loading, and an Irrigation fieldtrip to sophomores in the AG II class at Montrose High School.

CD IWM staff coordinated **the Cover Crop Tour** on **6 farms** ranging from crops after beans and sweet corn to grazing differences on various cover crops for 30 people. Conservation District staff prepared two reports, one entitled "2015 Cover Crop Management and Acreage for the Uncompahgre Valley" and the other entitled "Comparison of 3 Different Organic Inoculants and Fertilizer Treatments on Small Pastures to Improve Soil Health."

Lower Gunnison Unit – Delta and Montrose Field Offices - FY 2015 Irrigation Water Management (IWM) Summary and Outlook

As Advanced Irrigation Technology (AIT) gains acceptance by a greater number of producers, the use of modern tools and advanced techniques will become increasingly important for irrigation system operation and maintenance and proper water management. The IWM Specialists continue to work with local research scientists to explore new irrigation technologies and to provide the vital role of liaison between research and the producer. Through workshops, field days, tours, news articles and coordination with Colorado State University Extension, irrigation equipment suppliers, Conservation District Boards, and irrigation water districts, the IWM specialists will continue to bridge the gap between producers and the latest advancement of irrigation technology.

During the 2015 irrigation season the Delta and Montrose IWM specialists teamed up to bring a new and powerful irrigation technology to producers by deploying the DUALEM electromagnetic geophysical instrument. The DUALEM is used to perform surveys of soil conductivity. This survey information is then used to generate a salinity map of the surveyed area. Producers can utilize this information to determine if poor field performance is due to excessive salts, and can locate salinity hot spots throughout a field or property. During the 2015 season DUALEM surveys were completed on 6 fields across a total of 220 acres of ground. These were performed with 3 NRCS Resource Soil Scientists from across the state. These surveys are proving to be powerful tools for the producer and are expected to continue during 2016.

Uncertain economics will continue to be a concern for agriculture producers with the price of fuel, fertilizer, seed, equipment, technology, and the value of their commodity. Producers must become efficient consumers of water and energy in order to stay profitable. Efficient water application, reduced tillage, and other methods that incorporate efficient use of water and

energy resources need to be advocated, publicized, and incorporated into project ranking considerations.

Both IWM Specialists believe an important way to reduce economic uncertainty and increase efficiency is to promote soil health practices throughout the Lower Gunnison Unit. Together they have taken a greater role in the local soil health team by organizing and promoting the Uncompahgre Soil Health conference, the annual fall cover crop tour, and the local soil health team meetings. This includes securing speakers for these events and coordinating with multiple agencies and landowners to bring high quality soil health information and speakers to local producers. These efforts are also expected to continue throughout 2016

The guidance document developed in FY 2011 that outlines the steps, timeframes and appropriate action that needs to be taken in order to achieve successful IWM program delivery was followed. This guidance document included:

- A list of all producers applying IWM
- An initial field visit to establish baseline conditions
- IWM plan development
 - Soil moisture levels
 - Crops being produced and target consumptive use requirements
 - Follow-up monitoring and recommendations for necessary adjustments
 - Documentation of irrigation applications, frequency and adjustments in management to achieve improved efficiencies
 - Certification based on documented measurable improvements in system operation efficiency.

The NRCS Mobile Irrigation Lab (MIL) is another valuable tool in providing effective follow-up and monitoring for acquiring data in order to make effective recommendations for improvements in management.

The MIL resource was utilized more efficiently in 2015 through:

- Prioritizing those clients and monitoring needs that would have the greatest benefit from its use.
- Continuing to schedule the MIL by the month to better benefit both areas of the basin.

McElmo Creek and Mancos Valley Units - Cortez Field Office – FY 2015 Outreach and Irrigation Water Management (IWM) Highlights

Since the Colorado River Salinity Control Program inception in the McElmo Creek Unit in FY 1989 and the Mancos Valley Unit in FY 2004, the Natural Resources Conservation Service (NRCS) in partnership with the local Conservation Districts have been applying improved irrigation systems and practices with cooperators in the McElmo Creek and Mancos Valley Units as part of the Colorado River Salinity Control Program (CRSCP). Funding for the CRSCP has been primarily possible through the Environmental Quality Incentives Program (EQIP) and the Basin States Program (BSP). Within the past few years the former Basin States Parallel Program (BSPP) transitioned to the new Basin States Program (BSP). The transition gradually shifted the focus from on farm improved surface delivery systems to that of piping large scale main lateral off farm canal and ditch delivery systems. This has created a great deal of interest from group and irrigation companies in future participation in BSP. With the advent of the new BSP and piping main stem delivery systems the conversion of existing surface irrigation systems to sprinkler irrigation is expected to continue as irrigators have the opportunity to tap into pressurized gravity flow delivery systems.

McElmo Creek and Mancos Valley Units - Cortez Field Office – Salinity Outreach Activities

- October 2014 – District conservationist appeared on KSJD’s the “Zine” radio show for 20 minutes. Conversations included our most common assistance types, irrigation improvement, and how to apply. We also discussed the USDA strike force initiative and how we are reaching out and trying to expand our services to underserved groups. This was part of an effort to ensure people are aware of programs that help in salinity reduction and to reach a large diverse audience and increase program participation.
- January 2015 – Participated in the CSU Southwestern Research Center Advisory Meeting. The advisory meeting discussions included general conservation issues and ways for agricultural producers to conserve water.
- February 2015 – Spoke on KSJD Radio’s “Big Fat Farm Show” about general conservation and promoted participation in NRCS programs such as irrigation system improvements. Spoke about how NRCS is a resource available to us to help use our resources including water in a more sustainable manner.
- June 2015 – The field office technician did an interview on a local agricultural radio show about soil health, water management, other general conservation practices, and promoted both the Conservation District and NRCS programs.
- June 2015 – Gave a presentation at the Empire Electric Efficiency Workshop on programs available to make irrigation improvements and irrigation efficiency management considerations.
- June 2015 - Two irrigation workshops are being conducted to provide information about making irrigation system improvements and considerations to improve irrigation water management.
- August 2015 - Two Local work group meetings were held one for Dolores and one For Mancos conservation districts. Approximately 15 people were in attendance for McElmo and 9 in Mancos. Spoke about the salinity program’s origination and how it is funded

and reasons for is emphasis in the past and potential for the future.

- August 2015 – Submitted an article in the local paper about the salinity program and other natural resource issues. Article spoke about local workgroups and emphasized NRCS is looking towards local people and groups to help direct its programs, a big part of which is the salinity program.
- August-Sept 2015 – Staff met with Dolores Water Conservancy District (DWCD) on multiple occasions. The meeting provided an opportunity to look at existing irrigation systems and to discuss ways to potentially improve them. The meeting also included discussion about RCPP proposals to help reduce water consumption in the DWCD project area and the Montezuma Valley. This included not only infrastructure but management activities to improve agricultural systems and their overall health.
- August 2015 - Met with the CSU Yellow Jacket Experiment Station advisory committee. Met to discuss direction of research at the station and what activities should be pursued, some of which could involve advanced irrigation techniques. Approximately 15 people in attendance.

McElmo Creek and Mancos Valley Units - Cortez Field Office - FY 2015 Irrigation Water Management (IWM) Activities

A large emphasis was placed on Irrigation Water Management (IWM) in FY2015. Staff conducted two “In-the-Field Irrigation Water Management Classes”, one in McElmo and one in Mancos. Approximately **550 invitations** were sent to local producers as well as flyers etc, to advertise the event. A total of **12 participants** from both the McElmo and Mancos project areas attended the classes. An Irrigation Water Management booklet was provided to each participant.

Staff developed **32 IWM Plans** on **857 acres** in McElmo, and developed **3 IWM Plans** on **43 acres** in Mancos.

The IWM follow-up resulted in certification of the Irrigation Water Management (IWM) practice on **995 acres** in salinity contracts within the McElmo Creek Unit, and **45 acres** on salinity contracts within the Mancos Valley Unit. The retirement of the IWM specialist several years ago, followed by the death this year of the individual acting as the IWM specialist, as well as turnover in other key supporting staff over the last several years has made maintaining a cohesive IWM program difficult. There were no new Conservation Technical Assistance (CTA) irrigation water management acres reported this fiscal year. The available irrigation water management assistance was focused on the existing and new salinity control contracts to maximize the conservation benefits from the funded salinity control projects.

Staffing changes were made to help maintain irrigation water management training to producers. The sudden loss of the technician handling IWM in the 2015 irrigation season as well as a high turnover of other technicians left a void in staff with advanced IWM expertise. Fiscal year 2015 saw the hiring of 4 new technicians in the Cortez field office. This included 2 Basin Salinity technicians and 2 Farm Bill District Conservation technicians. One of the new technicians hired is in the process of being trained to handle IWM issues as part of his job description.

- ◆ Email to 550 producers providing IWM information and to offer technical assistance
- ◆ Radio spot on Big Fat Farm Show promoting IWM and other conservation activities
- ◆ Presentation at local Rural Electric Association community meeting on irrigation efficiency improvements , 14 in attendance
- ◆ Held two hands-on IWM field presentations. The demonstrations gave producers the opportunity to try out various irrigation systems and demonstrate IWM techniques
- ◆ Worked with the Conservation district to purchase watermark sensors. A total of 4 units are now available for trial use by producers to help demonstrate the benefit of soil moisture tracking. Sensors have been installed on 1 producer and we are currently in the process of working with several other producers to install the sensors on their property.
- ◆ Met with Dolores Water Conservancy District and Montezuma Valley Irrigation Company to discuss salinity projects, how NRCS can benefit them, and to improve communication between these organizations and NRCS.

McElmo Creek and Mancos Valley Units - Cortez Field Office - Irrigation Water Management (IWM) Summary and Outlook

1. Future monitoring efforts should focus on the changing land-use conversion of large agricultural tracts into smaller tracts to monitor the effects the change in land use has on salinity control. Future monitoring efforts should also focus on the aging irrigation conservation practices to address their potential decline in irrigation system performance. This monitoring and evaluation should include the investigation of cost-share methods to help producers adapt their existing systems to the new technologies and to bring these systems up to current NRCS Irrigation standards.
2. It is recommended that the Irrigation Water Management Specialists continue to provide assistance to the landowners during the first season of use for the improved irrigation systems installed under the Salinity Control Program.
3. The goal of IWM program is to provide the necessary assistance and information to help the Salinity Control Program achieve the highest level of salinity reduction possible with the combined irrigation improvements and enhance water management. This IWM activity will provide the much needed follow up assistance and irrigator support with participating landowners to help them maximize their irrigation efficiencies and over-all success.
4. Utilizing and partnering with other skilled professionals like the CSU Extension, irrigation suppliers, Conservation District Boards, and Irrigation Districts can accelerate the success of the IWM Program and its acceptance.
5. The Field Office staff will continue Irrigation Water Management courses for program participants during the 2016 irrigation season.

Silt Unit – Glenwood Springs Field Office – FY 2015 Outreach and Irrigation Water Management (IWM) Highlights

Since the Salinity Control Program inception in the Silt Unit in FY 2005, the Natural Resources Conservation Service (NRCS) in partnership with the local Conservation District have been applying improved irrigation systems and practices with cooperators in the Silt Unit under the Colorado River Salinity Control Program (CRSCP). Funding for the CRSCP has been primarily possible through the Environmental Quality Incentives Program (EQIP) and the Basin States Program (BSP). Within the past few years the former Basin States Parallel Program (BSPP) transitioned to the Basin States Program (BSP). This transition is gradually shifting the focus from on farm improved surface delivery systems to that of piping large scale main lateral off farm canal and ditch delivery systems.

Silt Unit – Glenwood Springs Field Office - Salinity Outreach Activities

- January 2015 – District completed mapped all locations within the Silt Salinity Area that were in either flood or improved flood irrigation systems and sent a mailing to all property owners of said systems a reminder that their property was within the Silt Salinity Area and that special funding was available to move to a more efficient irrigation system. Total mailing was to 220 irrigators.
- February 2015 – The Bookcliff Conservation District personnel discussed funding under the Silt Salinity Control Area for projects to improve irrigation systems. Total attendance was more than 100 people.
- May 2015 – The Bookcliff Conservation District installed CoAgMet (Colorado Agricultural Meteorological Network) station on Silt Mesa within the Silt Salinity Area to provide information to irrigators on climatic data for irrigation water management to promote more efficient water use and for water quality improvement including salinity control.
- May 2015 – The Bookcliff Conservation District sent eNewsletter to over 280 landowners promoting the new CoAgMet station and irrigation water management assistance and funding.
- May 2015 - The Bookcliff Conservation District launched a page on their website with the CoAgMet stations and benefits to proper irrigation water management. The information and links were posted on Facebook as well.
- June 2015 – The Bookcliff Conservation District sent 400 letters to Silt Mesa residents informing them of the CoAgMet station and irrigation water management assistance and funding.
- June 2015 – the Bookcliff Conservation District scheduled a CoAgMet station information meeting for June 30th on how to use the stations information for proper irrigation water management.
- August 2015 – NRCS held a Local Workgroup Meeting and discussed Salinity issues in the area and the ability to use irrigation water management, sprinkler systems and piping systems to improve overall forage quality and quantity and lessen salinity in the river system
- January 2015 – Discussed the Silt Salinity Control Program opportunities and purpose to over 100 producers during the Conservation Districts Annual Ag Day in New Castle.

Silt Unit – Glenwood Springs Field Office – FY 2015 Irrigation Water Management (IWM) Highlights

In FY 2015 NRCS and the Bookcliff Conservation District had **3 new** Salinity contracts covering **51.2 acres**. Each of these contracts was provided with an Irrigation Water Management (IWM) worksheet that covered the type of crop, crop water needs, and estimates of irrigation water needed to apply. Owners were instructed on how long and how often they would need to irrigate with their system in order to meet crop needs and minimize leaching.

In FY 2015 NRCS and the Bookcliff Conservation District worked with **28 existing** contracts covering **1,510 acres** on their IWM follow-up and practice certification. During the 2015 irrigation season **3 can tests** were conducted on center pivot, sideroll and big gun irrigation systems to verify uniformity of nozzle application rates.

Silt Unit – Glenwood Springs Field Office - FY 2015 Irrigation Water Management (IWM) Activities

The staff completed irrigation water management assessment and certification on a total of **28 landowners** covering **1,510 acres** from irrigation information collected and irrigation assistance provided to landowners during the 2015 irrigation season.

Glenwood Springs IWM Specialists Report

- The Glenwood Springs NRCS office has **28 EQIP contracts** with Irrigation Water Management scheduled for 2015 covering **1,510 acres**. Twelve (12) are in Eagle County with 443 acres, 13 are in Garfield County with 805 acres, and 2 in Pitkin County with 96 acres. The primary focus for IWM is in Garfield County.
- All of this IWM assistance provides improved irrigation application efficiency that reduces deep percolation and the salt loading from the excess irrigation water, whether it is within the designated salinity control unit or is in the other Colorado River Basin irrigated areas. This additional salinity control benefit is typically not calculated, but does contribute to the overall water quality and salinity control for the Colorado River Basin.
- In addition staff Specialists made **15 Conservation Technical Assistance (CTA)** visits to non-salinity contract irrigators to provide technical help for an additional **88 acres**. These irrigators either solicited management assistance directly through the field office or through other agricultural entities. During these CTA visits the Specialists provided irrigation system operation and maintenance assistance on the existing system, and also discussed potential benefits/challenges with the current irrigation system and answered questions for producers interested in considering some of the newer more efficient irrigation systems. The potential for improved IWM on these acres helps provide an additional unmeasured and unreported salinity control benefit in the Silt project area.
- As of December 1, 2015 the IWM Specialist contacted and provided assistance to all **28 active contract landowners** in all the counties covered by the Glenwood Springs Field Office

- During each contact with a landowner various items were discussed and assistance provided. Each visit covered the operator's understanding of proper record keeping, the crop irrigation water needs, application rates for the irrigation system being used, methods of knowing when soil moisture is depleted to the point that water should be applied, the need to record how long water was applied, record how much water is being applied to the field and determine inches of water applied.
- Besides checking on the understanding of IWM and record keeping each visit include a walk in the field with the landowner and probe the soil to determine depth of water saturation in the soil. The hand-feel method of determining soil moisture content is demonstrated. The producer is also offered the use of rain gauges to monitor water application with sprinkler systems.
- Three (3) large volume ditches were evaluated for seepage problems, water control problems and delivery problems. Each ditch operators were given a handbook with maps and information on where and how severe these problems are. The 3 ditches collectively provide irrigation water delivery to over 1,500 acres.

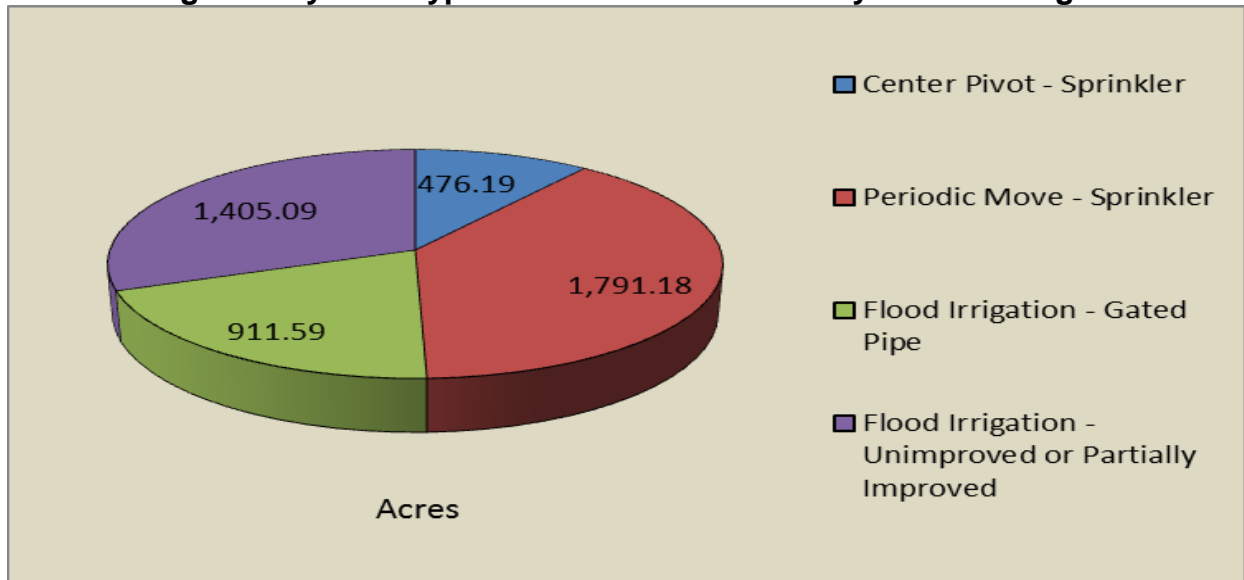
Silt Unit Irrigation Water Management (IWM) Summary and Outlook

The completed irrigation scheduling reports were provided by the landowners at the end of the irrigation season, and irrigation performance reports were returned to the landowners showing irrigation water amount they applied for the 2015 irrigation season, and recommendations were provide to each landowner on how they might be able to improve their irrigation management in 2016 irrigation season. Soil moisture probes were provided to each irrigator with instruction on their use, to provide additional management tools and information to the irrigators/operators on soil moisture monitoring and irrigation scheduling.

The Silt Salinity Area evaluation was completed in FY 2014 by Bookcliff Conservation District staff. They evaluated all irrigated acres within the Silt Unit for system type using aerial imagery and on the ground investigation when needed. The chart below shows the amount of acres in each type of system. Over 1,400 acres are still in some type of un-improved or partially improved flood irrigation system and another 900 plus acres are under an improved gated pipe flood irrigation system. The field review shows that only half of all irrigated acres are under some type of sprinkler system as of the 2014 irrigation season. The Bookcliff Conservation District crossed these irrigation system acres with parcel land owner data layer from Garfield County, and over 90 letters were sent to landowners that still use flood irrigation with information on EQIP and BSP.

The irrigation system data collected is displayed in the following pie chart.

Silt Unit Irrigation System Type – Colorado River Salinity Control Program



The information displayed is based on field data collected during the 2014 irrigation season by the Bookcliff Conservation District.

In FY 2015 the Bookcliff Conservation District with the help of Colorado State University installed a CoAgMet station within the salinity area. The CoAgMet network has been around since the 1990's and gives the public up to date Evapotranspiration reports so that landowners can irrigate appropriately. Bookcliff Conservation District, with the help of NRCS, attached these reports to their website for ease of access. Reports from the data are sent to landowners via an e-Newsletter by the district monthly. The Bookcliff Conservation District has asked NRCS to show the reports and how to use them in January of 2016 for local AgDay event.

Grand Valley Unit Completed Project Grand Junction Field Office – FY 2015 Outreach and Irrigation Water Management Highlights

Since the salinity program inception in FY 1979, the Natural Resources Conservation Service (NRCS) in partnership with Conservation Districts have been applying improved irrigation systems and practices with cooperators in the Grand Valley Unit under the Colorado River Salinity Control Program (CRSCP). Funding for the CRSCP in recent years had been primarily possible through the Environmental Quality Incentives Program (EQIP) and the Basin States Program (BSP). Within the past few years the former Basin States Parallel Program (BSPP) transitioned to new Basin States Program (BSP). This transition gradually shifted the focus from on-farm improved surface delivery systems to that of piping large scale main lateral off farm canal and ditch delivery systems. This has created a great deal of interest from group and irrigation companies in future participation in BSP. Also, there is a greater trend toward conversion of existing improved surface systems to highly efficient, advanced irrigation technology (AIT) and in particular with micro-spray irrigation. Currently, this trend is primarily occurring in Palisade area within the Salinity Control Unit.

Grand Valley Unit Completed Project – Grand Junction Field Office – Salinity Outreach Activities

- October 2014 - For the fourth year, students in the Sustainable Agriculture Program at Western Colorado Community College went to the farm to learn about soils. This year soil pits were dug in areas with two different soil types, with both in a field planted in a cover crop. Soil quality issues were discussed, a slake test demonstration was given and a discussion about cover crops in a furrow irrigation field with minimum tillage. The soil health considerations support good irrigation water management and better crop quality enhancing management on the salinity improvement projects.
- October 2014 - Gave a presentation to a soils class at Colorado Mesa University. Included a slake test demonstration, discussion about a “Soil Health Bucket” to understand the tools (soil health characteristics) in the bucket and what those tools were showing, and general discussion about local irrigation systems developed to promote irrigation water management, water conservation, and salinity control.

Grand Valley Unit Completed Project – Grand Junction Field Office - Irrigation Water Management (IWM)

Beginning in FY 2004, NRCS, in cooperation with the Mesa Conservation District and the Colorado State Conservation Board began a program designed to place emphasis on Irrigation Water Management (IWM). During FY 2006, a full-time IWM position was established to increase emphasis and support to landowners with IWM.

Grand Valley Unit Completed Project – Grand Junction Field Office - FY 2015 Irrigation Water Management (IWM) Activities

Visits were made to provide irrigation water management assistance, and to check and certify Irrigation Water Management (IWM) on **95 farms** during the 2015 irrigation season. The FY 2015 irrigation water management activities include: completing **43 IWM reviews** on **1,168 acres** for the contracts with planned IWM, provided **52 irrigators** with in-field technical assistance for irrigation water management, soil health, and irrigation system and crop management options. IWM plans were developed for **7 new contracts** funded in FY 2015 on **38.3 acres**. Hanson Data Loggers and soil moisture sensors were installed on **5 sites** covering most of the contracted acres to assist the irrigators with soil moisture monitoring and irrigation scheduling.

In addition staff Specialists made **5 Conservation Technical Assistance (CTA)** visits to non-salinity contract irrigators to provide technical help for an additional **43 acres of IWM**. These irrigators either solicited management assistance directly through the field office or through other agricultural entities. During these CTA visits the Specialists provided irrigation system

operation and maintenance assistance on the existing system, and also discussed potential benefits/challenges with the current irrigation system and answered questions for producers interested in considering some of the newer more efficient irrigation systems. The potential for improved IWM on these acres helps provide an additional unmeasured and unreported salinity control benefit in the Grand Valley Unit Completed Project area. In addition to on-farm CTA visits the IWM Specialist also conducted **one IWM class attended by 10-15 individuals**. The attendees were from all over the western slope including the Grand Valley and other salinity control areas.

The Conservation District IWM Specialist held a class at the Children's Water Festival with local students on how to use ball probes to measure soil water penetration and to evaluate irrigation system performance at their home, and is working with small acreage land-owners to improve water management on their irrigated pasture and hayland.

Grand Valley Unit, Completed Project – Grand Junction Field Office - FY 2015 Irrigation Water Management (IWM) Summary and Outlook

As Advanced Irrigation Technology (AIT) gains acceptance by a greater number of producers, the use of soil infiltration tests will become increasingly important information for irrigation system operation and maintenance and proper water management. The IWM Specialists can continue to bridge the gap between producers and the latest advancement of irrigation technology through: workshops, field days, tours, news articles and coordination with CSU Extension, irrigation equipment suppliers, Conservation District Boards, and irrigation water districts.

Uncertain economics will continue to be a concern for agriculture producers with the price of fuel, fertilizer, seed, equipment, technology, and the value of their commodity. Producers must become efficient consumers of water and energy in order to stay profitable. Efficient water application, reduced tillage, and other methods that incorporate efficient use of water and energy resources need to be advocated, publicized, and incorporated into project ranking considerations.

Colorado Salinity Control Unit Future Outlook

Lower Gunnison Unit – Delta and Montrose Field Offices - Future Outlook

The Lower Gunnison Unit is undergoing significant changes in landownership and the size of many of the operating units. Urban/rural small acreage units are more common and are changing the types of operators applying for program assistance. The smaller units still offer good opportunities for making irrigation delivery and system improvements for salinity control, but the operators often have full-time employment off-farm and higher levels of management and agricultural production may not be their main goal in making irrigation improvements.

Increasing interest in ditch replacement of off farm laterals and canals through the US Bureau of Reclamation (USBR) Basin Wide Program will result in more opportunities for on-farm treatment and encourage participants to implement higher efficiency irrigation systems. As landowners see the chance to make improvements with assistance from EQIP and BSP, participation in these two programs is expected to increase as well.

Due in part by many of the land ownership and demographic changes in the Lower Gunnison Unit, additional IWM educational activities planned for 2016 include:

- A series of educational meetings about water efficiency, new irrigation technologies and water banking in collaboration with the Colorado State University Water institute.
- A series of in field classes for beginner irrigators to learn about new types of irrigation systems and water efficiency measures.
- A five-session course addressing water resource issues and irrigation efficiency, for all Delta County High School FFA students by the IWM Specialist in the Delta Field Office.
- Drought educational presentations to the Colorado Cattlewomen's Association, and at the Colorado State University Small Acreage Workshop.
- Continue presentations on Irrigation Water Management to community groups and organizations.
- Increased IWM technical assistance to non-program participants.

Effective coordination of outreach, planning and program implementation activities should be explored by the partner agencies to enhance overall program delivery, particularly in units like the Lower Gunnison with both USBR and NRCS salinity control activities, and the many other supporting conservation interests such as the Soil Health Initiative, the Selenium Management Program and the Selenium Task Force. Additional coordination between agencies and the local partner organizations can help all of the groups to help support each interest to meet their project goals. The establishment of the Salinity Field Coordinator position this year shows that partner agencies are trying to fill the need for a more coordinated approach to salinity control, with the Salinity Field Coordinator acting as a local resource to water users, providing up to date information on assistance that is available to accomplish salinity reduction and raising water users knowledge and awareness of opportunities available.

The Lower Gunnison Unit has additional emphasis placed on making irrigation improvements based on the endangered species issues from excess selenium raised during the re-authorization of operations for the Aspinall Unit. The USBR was directed by the US Fish and Wildlife Service Biological Opinion to work the local water users and other agencies to develop

a Selenium Management Program to accelerate the rate of irrigation system improvement to help reduce the risk of selenium loading and concentrations from interfering with the reproduction of endangered fish species and negatively affecting the recovery efforts. It is unclear at this time if this additional support and consequence will increase the rate and number of applications for salinity control financial assistance.

The estimated irrigated acres to be treated under the Salinity Control Program is currently assumed to be 115,000 acres as adjusted due to changing land-use, is still considered to be an achievable number, but it is somewhat unclear how many years may be needed to reach the final treatment goal. The NRCS initiated a field test during the spring of FY 2011 to determine the amount of staff time and resources it would take to complete a visual inventory of the current on-farm irrigation systems. Although the results of the study provided insight into the resources needed to complete such an inventory, no entity currently has the staff available to complete an inventory for the Lower Gunnison Unit. The local Conservation Districts are working with funds from USBR and the Colorado River District to complete an inventory of the irrigation delivery systems not included in the USBR Uncompahgre Project inventory. These types of inventories are essential in determining the actual treatment needs, and to help prioritize and effectively target the areas still needing treatment.

McElmo Creek and Mancos Valley Units- Cortez Field Office – Future Outlook

The McElmo Creek and Mancos Valley Units are undergoing significant changes in landownership and the size of many of the operating units. Urban/rural small acreage units are more common and are changing the types of operators applying for program assistance. The smaller units still offer good opportunities for making irrigation delivery and system improvements for salinity control, but the operators often have full-time employment off-farm and higher levels of management and agricultural production may not be their main goal in making irrigation improvements. The smaller contract size may result in an equal number of applications and contracts while the acres treated, dollars allocated, and newly reported tons per year of salt load reduced may continue to decline.

The NRCS Irrigation Water Management (IWM) tool continues to be used for contracts and each active contract received a management assistance visit with a follow-up contract in the fall to help with IWM reporting and education.

There has been a significant increase in interest converting from sideroll/wheel line to center pivot and drip irrigation in the area. The primary reason for increased interest is for labor savings with the secondary interest being water conservation. As stated previously many producers in the area have off-farm employment as well as a lack of affordable labor. Therefore, interest in automation of irrigation systems has been increasing rapidly. However, typically NRCS has been unable to fund these projects in this area. There have been several major impediments to implementing these practices. Fields in the area often have slopes that are greater than what is allowed in current NRCS specifications. Questions have been raised concerning the specification, and if it has been reevaluated utilizing the most recent technology, or if variable rate application of irrigation is viable and if there are cultural/management techniques that could be adopted to allow these types of systems to be installed. Several operators argue there are many non-cost shared pivots installed in the McElmo area have been

functioning well despite not meeting NRCS specifications. An additional impediment for drip and precision pivots is a general lack of knowledge and the availability of locally installed products with advanced technical improvements. The lack of knowledge is twofold. One question is will the advanced systems work in our area due to environmental and economic concerns. The second impediment is a deficit of knowledge/experience in the local NRCS and local suppliers on how to implement large scale drip systems for forage or crop types other than small scale vineyards and orchards.

Efforts would be beneficial to develop evaluation criteria for pivots and drip systems previously installed without cost-share, to determine if these systems are capable of functioning in conditions currently outside of the NRCS specifications. If variances were found that are acceptable to NRCS, revised specifications to help implement the new technology would be beneficial. Field office training on the latest advancements would also help with providing technical support to adopt the most up to date technology and thereby positively affect salinity savings.

Advancements in sprinkler irrigation technology and adoption of the more precision irrigation application systems are occurring at an accelerated pace in the project area. Adoption of these advanced technologies may help provide a means of sustaining agricultural production on irrigated land that is competing with the on-going development pressures and economics. Linking improved irrigation technology with value added crops may provide additional economic opportunity for producers interested in continuing commercial agricultural production. The Irrigation Water Management Specialists funded through US Bureau of Reclamation (USBR) matching technical assistance and by NRCS technical assistance, are an excellent source of specialist support to help transfer these technologies and management options to irrigators in western Colorado.

Energy efficiency is an increasing concern both nationally and locally, and the potential energy savings resulting from the use of higher water application efficiency irrigation systems provides an opportunity for additional benefits to the producer by selecting the higher efficiency systems. Advocating the use, highlighting the additional benefits, and incorporating these additional benefits into the ranking and prioritization of salinity projects will encourage additional irrigation improvements that support both salinity control and water use efficiency in the project area.

Without additional irrigation delivery system improvements it is likely the interest in additional on-farm irrigation improvement in the Mancos Valley Unit will remain relatively low, and the project will not meet projected off-farm and on-farm treatment amounts or salinity reduction goals. Some type of amended project goals may need to be defined, recorded, and reported if funding for additional off-farm delivery projects is unlikely.

Silt Unit – Glenwood Springs Field Office - Future Outlook

Applications for FY 2015 within the Silt Salinity Control Unit and for EQIP Water Quality are low again this year. Converting from flood irrigation to sprinkler systems is still the primary improvement planned. Irrigation Water Management will be planned on all contracted acres for at least two irrigation seasons to provide the maximum conservation and salinity reduction

benefit. NRCS Planners will use the new Irrigation Water Management Tool when developing a basic conservation plan for salinity and water quality, and will increase outreach to promote more advanced irrigation water monitoring.

Energy efficiency is of increasing importance both locally and nationally. The potential energy savings resulting from utilization of higher water application efficiency systems should be advocated, publicized, and incorporated in the project ranking considerations. Energy costs are of concern to most applicants, especially when going to sprinkler systems in the area, so projects that incorporate energy production as a side benefit to the piping of ditches has been gaining more traction and may bring more applicants who were resistant to going to irrigation systems.

The Field Office will be conducting additional analysis by a qualified Biologist to determine the amount and types of wildlife habitat replacement required to offset the habitat lost due to the salinity control irrigation system improvements completed as part of the project.

The Bookcliff Conservation District and NRCS used the irrigation assessment data to target landowners with flood irrigation systems through a direct mailing about program funding opportunities. The Bookcliff Conservation District and NRCS hopes that this targeted approach will increase the application rates for FY 2016 and FY 2017.

Grand Valley Unit Completed Project - Grand Junction Field Office - Future Outlook

Recommendations for Future Monitoring and Action

- ◆ For FY 2016, efforts will continue on all new EQIP and BSP contract recipients to assist them with irrigation water management and the proper use of newly installed irrigation systems.
- ◆ Emphasis will be placed on landowner irrigation scheduling tools and methods, such as “the checkbook method” and field probing for soil moisture observation.
- ◆ The effects of conversion to urban and small acreage land units will continue to be evaluated to assess the effects from the changes on the projected salinity reduction. Many of the areas previously treated under the salinity control program are being converted to the smaller 1 to 2 acre parcels. The areas closest to the urban centers near Grand Junction, Fruita, and Loma are transitioning to these smaller parcels. This trend is likely to continue even with the overall community’s desire for larger lots that create the appearance of more open space, etc. The subdivided acres continue to be irrigated, but by a new landowner, and with different crops, usually hay or pasture, and lawn and garden.
- ◆ In addition, many of the larger tracts are being subdivided into 10 to 40 acre parcels under different ownership that remain in some type of agricultural crop production, but under a new owner/manager who works a primary job off the farm and may have limited experience with irrigation and crop management.
- ◆ Significant problems still exist in the delivery of water through unimproved and outdated laterals, and other group delivery systems. There is an opportunity for

these groups to incorporate and improve these systems through the salinity control program however it is a complicated process for this organizational change to occur. Many of these delivery laterals have doubled or tripled the number of water users due to subdivision, and the influx of people with limited understanding of irrigation water delivery which has led to additional complaints and operational problems. The EQIP requirements for being a qualified agricultural producer and each participant having an individual contract are not well suited to provide financial incentive payment for improving these mixed agriculture and sub-urban systems. The Basin States Program (BSP) is probably more flexible with the mix of agricultural and non-agricultural water users, and will be the program used to address these problems in the future.

- ◆ Many of the irrigation system improvements installed during the early years of the salinity program are nearing the end of their practice and amortization life. The policy questions and on-going salinity reduction benefits from updating and replacing the aging systems will need to be addressed. Many of the improved irrigation systems are capable of lasting far longer than the stated practice life, e.g. underground pipeline, however other surface installed portions of the irrigation improvements have deteriorated. From a salinity control perspective, the maintenance of the improved irrigation system is important. The policy questions center on whether the maintenance of previously installed systems is solely the landowner's responsibility or whether there is still some role for public participation through the salinity control program.
- ◆ The participation level in the program and the acres treated to date meet or exceed the salinity goals for the program. However there is still significant interest for some irrigation improvements and irrigation system upgrades, particularly in the areas with vineyards and fruit crops. For the more traditional agricultural crops on the larger acreages, there is a continued decrease in applications, since the majority of these acres are already under some type of improved irrigation system and there has not been much interest in upgrading to some type of higher performance irrigation systems, such as sprinkler irrigation. Many of the current applications received are for irrigation improvements for parcels as small as one acre. Unless there is a shift to the higher efficiency irrigation systems, or there are significant improvements to flood irrigation technology, this trend is expected to continue.
- ◆ There are on-going opportunities to assist new and inexperienced land owners with education and training on effective irrigation water management and irrigation system operation. There has been an increase in absentee landowners which is an additional management challenge.
- ◆ The projected salinity reduction for these changing land units should continue to be evaluated, so appropriate adjustments to cumulative salinity loading information can be based on some type of assessed value.
- ◆ Additional efforts to promote quality wildlife habitat projects will continue in the Grand Valley Unit.
- ◆ Staff will continue to receive training in the latest irrigation technology to improve technical and management assistance to landowners.
- ◆ Given the past and current trends in land-use changes, design consideration is needed for each project to accommodate some likely future changes. Designs may provide a longer term salinity control benefit if they anticipate and take into account potential future development, which may drive up the initial construction cost.
- ◆ Cost effectiveness of the Grand Valley program is being affected by the increase in overall construction costs, and by the reduction of the size of parcels being treated

- through the cost-share programs.
- ◆ A follow-up assessment of the irrigation improvements in place and the wildlife habitat replacement projects in place will be conducted on a 3-year interval to continue reporting the salinity progress being applied and maintained within the Grand Valley Unit Completed Project until all of the project goals have been met. The future duration of these assessments has not been determined at this time.

Out of Project Area Tier 2 Future Outlook

The opportunity for cost-effective salinity control in the Out-of-Project Area (OPA) Tier 2 irrigation improvements remain a good and viable opportunity to expand the Colorado River Basin salinity control efforts in the greater Colorado River Basin. Based on the Colorado projects selected for salinity control funding in FY 2013 through FY 2015, the out-of-project irrigation improvements provide a very cost-effective way to utilize salinity funding not needed in any given year in the established project areas, or to utilize small dollars balances from the established project areas.

The Out-of-Project Area irrigation improvements utilized some of the dollar balances remaining from funding irrigation improvements in the designated salinity control project areas. The Out-of-Project Area amortized cost per ton for FY 2015 was \$70.41 per ton which is significantly lower than the FY 2015 amortized cost-per-ton values in any of the established salinity control project areas. Utilizing the excess funds for salinity control in the Upper Colorado River basin remains a very cost-effective way to achieve additional salinity control with the designated salinity funds.

Utilizing the available funding to cover all of the needed and feasible projects in the established salinity control units first and then funding the most cost effective out-of-project area irrigation improvements second provides a means to utilize the annually appropriate funding as interest in making irrigation improvements in the project areas varies on an annual basis. During the six years this option has been available, the annual funding not used in the established project areas varied from \$42K to \$1.3M.

The NRCS currently uses the EQIP site specific environmental analysis process to determine the environmental effects from each individual OPA project. On-going spot checking and quality assurance reviews are conducted to assure the site specific environmental analysis is adequately quantifying the impacts to irrigation enhanced wildlife habitats.

The NRCS Field Staff complete a site specific environmental evaluation for each project that looks at the specific environmental effects from the proposed project actions including impacts to soil, water, air, plants, and animals, plus several human and social factors. In addition, effects to Special Environmental Concerns such as Endangered and Threatened Species, Cultural Resources, Clean Air Act, Clean Water Act, Wild and Scenic Rivers, and other resource requirements and priorities are identified. Based on the environmental evaluation adjustments may be made to the project to offset or mitigate negative impacts. The environmental evaluation process may also identify the need for additional analysis and consultation where appropriate.

Wildlife Monitoring and Evaluation

Colorado Salinity Control Unit Wildlife History

Salinity control work by the Natural Resources Conservation Service (NRCS) has gone through different funding programs during the duration of the Colorado Salinity Control Projects. The first was Agricultural Conservation Program through USDA- Agricultural Conservation Service from FY 1979 through FY 1985, then the Colorado River Salinity Control program (CRSCP) from FY 1986-1995. The next program was the Interim Environmental Quality Incentives Program (I-EQIP) for FY 1996. The current program, from FY 1997 through FY 2015 is the EQIP Program which includes matching funds from the Bureau of Reclamation delivered through the Basin States Program (BSP/BSPP aka Basin States Parallel Program).

The Grand Valley Unit as the first salinity control project area in Colorado started with biological assessments to estimate the habitat values lost through both the NRCS on-farm irrigation improvement program and the USBR irrigation delivery system improvements. A variety of habitat analysis and assessment tools were used to estimate the hydrologic changes and how they might affect the irrigation enhanced habitat. Through these assessments and work with the USFWS a set habitat acreage replacement goal was established for the Grand Valley Unit.

With subsequent changes to the salinity control legislation the “Act” specified the “voluntary replacement of wildlife values foregone”. The Lower Gunnison and McElmo Creek Units established an initial process to evaluate and track the impacts to “habitat values forgone using a habitat value system”. To meet this specification the NRCS chose to use the Habitat Evaluation Procedure (HEP) developed by the U.S. Fish and Wildlife Service (USFWS) for tracking “on farm” changes in wildlife habitat values. Seven species models were chosen to represent different aspects of wildlife habitat in the unit that may be impacted by the project.

The Ringneck pheasant model was chosen to represent habitat diversity, edge effect, and edge habitat. The yellow warbler model was chosen to represent cottonwood-willow and other woody habitat associated with irrigation ditches and tail water. The mallard breeding habitat model was chosen to represent shallow wetlands and nesting habitat surrounding these wetlands. The mallard –winter habitat model was chosen to represent winter roosting areas (large water bodies and ice free water) and management of crop residues. The meadow vole model was chosen to represent sedge- rush wet meadows often associated with leaky ditches and inefficient irrigation. The marsh wren model was chosen to represent cattail- bulrush (robust emergent) wetlands. The screech owl model was chosen to represent groups of large deciduous trees. The models used for each species were custom models that underwent peer review and were developed explicitly for this project with the assistance of USFWS. Changes in wetland values were tracked using the Avian Richness Evaluation Method (AREM) developed by Paul Adamus under contract with the Environmental Protection Agency (EPA).

Adjustments to the Wildlife Habitat Replacement Goals and Assessment Process

It was determined the evaluation and accounting using the HEP process was an effective tool to measure the impacts and to determine the wildlife habitat replacement needs to offset the

habitat values lost from making irrigation improvements for salinity control. However, continuing the full analysis process was consuming too much of the field Biologist's time and reduced their opportunities to promote good wildlife habitat replacement projects with willing landowners. In addition the initial program efforts tried to accomplish all of the replacement goals within the project areas and attempted to get cooperation for the replacement projects from each participating landowner. This approach created a scattering of fragmented habitat projects, and provided habitats that were often poorly managed and were not really supplying either the quality or quantity of habitat necessary to meet program goals.

The NRCS and USFWS entered into discussions with written correspondence to address the two primary issues. It was decided a desirable goal was to promote larger and more connected habitat projects, and to make sure the wetland projects were located in positions on the landscape where wetlands made sense. It was important to position wetland and water enhanced habitat projects in areas with high water tables and along existing riparian corridors to avoid perched wetlands that could contribute to additional water quality problems and to utilize existing water tables to assure the wetland projects would be sustainable. In addition the protection of the riparian corridors for wildlife provided connected habitats advantageous to many of the affected species.

To accomplish this goal it was mutually agreed the developed replacement and enhancement projects would count towards meeting replacement goals whether they were within or outside of an official project area, as long as salinity funds were used to cover the cost of the wildlife habitat replacement and enhancement, the habitat project was within a reasonable proximity of a salinity project area, and the type of habitats supplied met similar habitat types to the ones affected by the salinity control irrigation improvements.

In addition the USFWS concurred with changing the HEP driven accounting process to a pre-determined replacement rate of 2 acres of habitat developed or significantly enhanced for each 100 acres of irrigation system improvement. This rate was based on the multi-year analysis from the HEP process for the Lower Gunnison and McElmo Units, and the agreed to change also included the Mancos Valley Unit.

The Grand Valley Unit had a separate negotiated wildlife habitat replacement number based on previous analysis from the NRCS and USFWS of 1,200 acres^{/1} of habitat replaced and/or enhanced and was not changed to the 2 acres per 100 acres treated. However the Whitewater area and the DeBeque areas, added to the Grand Valley Unit, were not part of the negotiated 1,200 acre replacement. The replacement needs to those small additions will be added to the 1,200 acres number based a site visit for each project to calculate the expected losses and to add the needed replacement acres to the Grand Valley replacement goal.

^{/1} The 1,200 acre wildlife habitat replacement goal in Grand Valley is from written correspondence with the USFWS establishing a set project goal based on 60,000 irrigated acres, regardless of final treatment completed. Numerous biological assessments and habitat analysis were conducted in the Grand Valley Unit, and the 1,200 acre fixed goal was a negotiated amount based on these assessments and other factors.

The change to the 2 acre per 100 acre rate also does not apply to the Silt Unit due to a biological evaluation completed prior to project implementation that already identified predicted losses of 10 acres of wetland habitat and 40 acres of riparian/upland habitat losses for the proposed 2,800 acres of irrigation system improvements. Through the published Project Plan and Environmental Assessment, the US Fish and Wildlife Service reviewed the biological evaluation and concurred with the established replacement goal. It is unknown what the

replacement needs will be if the project applies more or less than the 2,800 acres of estimated irrigation treatment, and a follow-up biological evaluation may be needed to determine the final acceptable replacement amount if the estimated irrigation treatment acres are adjusted.

In addition to the final wildlife habitat replacement goal, the goal for each project area is to be concurrent, meaning the wildlife habitat replacement should be adequate to meet the replacement values for the applied irrigation system improvements in place in any given year. While the goal for wildlife habitat replacement is to be concurrent with irrigation improvements, it must also be understood that the hydrologic effects of the irrigation improvements and the wildlife benefits from developing fully functional wildlife habitat may take several years to be fully realized. Although some habitat losses from irrigation improvements are immediate, such as removal of ditch bank vegetation, other losses may occur over time as the hydrologic effects of reduced ditch seepage and excess deep percolation change the net flow of subsurface water. The full hydrologic impacts of reducing excess seepage and deep percolation may take a period of time sufficient to change and/or eliminate wetland or riparian vegetation completely. Similarly, it will take several years for replacement wildlife habitat to become fully functional. Thus concurrent means the habitat is certified as applied and the habitat benefits are based on the projected values for wildlife and are in balance with the amounts of irrigation systems improvements reported as applied.

A key issue raised by the U.S. Fish and Wildlife Service is the expectation the credited replacement acres be on the ground and functioning as effective habitat when the salinity project is considered complete. Some loss of wildlife habitat and irrigation improvement practices will continue to take place as operation and maintenance agreements expire in each salinity control unit. To assess the habitat project status, while the project is active NRCS Biologists will visit all wildlife habitat replacement projects at least once every three (3) years and adjust credited acres to what is actually on the ground and functioning.

During the initial salinity program implementation years a variety of habitat replacement options were tried. It was found planning numerous small habitat projects resulted in small fragmented habitats that were often neglected and were not managed and maintained as designed. In addition many of the small habitat replacement projects were planned with landowners who were not interested in developing wildlife habitat and on upland sites not necessarily suited to providing good salinity habitat replacement projects. During the early implementation years of the salinity control program under the CRSCP and I-EQIP/EQIP many operators reluctantly agreed to make small and typically expensive habitat improvements as a condition to getting the funding for their irrigation improvements. Many applicants fulfilled this agreement, but a number eventually canceled or never installed the scheduled habitat improvements, so the money was obligated but never spent.

The Grand Valley Unit started in 1979, the Lower Gunnison Unit in 1988, and the McElmo Creek Unit in 1989, and the early Colorado River Salinity Control Program wildlife habitat projects had an implementation and maintenance rate of between 20 to 60 percent. The early years of Interim EQIP and EQIP (1996-2006) had an implementation and maintenance rate of between 30 to 60 percent. These relatively low rate of suitable salinity habitat replacement acres were primarily due to cancellations and poor habitat management and maintenance, so much of the habitat loss occurred in the first few years after the initial contract was funded.

Subsequent habitat losses for the replacement contracts actually implemented are more often due to changes in land ownership and priorities, or as the result of land development activities and are typically not occurring at as great a rate as during the initial contract years. It is

expected the ongoing annual habitat losses for the replacement projects currently in place will not be as significant as occurred with the early contracts or during the early contract years.

This relatively high loss of planned versus applied and maintained salinity wildlife habitat replacement projects during the early program years resulted in a change in emphasis to focus on larger wildlife habitat projects in locations where habitats were more connected and on lands better suited to wildlife habitat development or enhancement. In addition the Colorado NRCS changed from including wildlife habitat practices in salinity irrigation improvement contracts to developing wildlife only contracts and established a separate competitive pool for the salinity wildlife contracts. The NRCS also utilized the available BSP/BSPP funds for wildlife habitat replacement projects on lands not eligible for the USDA EQIP funding program. This shift in focus is resulting in a higher implementation percentage, and the management and maintenance of the salinity wildlife habitat replacements projects is significantly better. Based on the more recent habitat reviews, it is expect the percent retention of the existing habitat replacement projects will continue to improve.

Salinity Upland Habitat

Upland habitat improvements typically suitable for replacement of habitat values forgone can include any combination of mid to tall grass, shrub, and tree plantings; livestock exclusion and grazing management to protect riparian corridors and other habitats established with program funds; and planting food plots. The habitat improvements are designed to replace habitat values associated with water enhanced habitats that are lost from salinity control practices that remove ditch bank vegetation, un-farmed areas associated with irregular shaped fields, fence rows, vegetation along drainage ways, wetlands associated with ditch and canal seepage etc. Prior to the introduction of irrigation water these types of habitats were typically not found in the salinity project areas except for corridors along riparian areas and in floodplains. However, these types of water enhanced habitats became very common in the irrigated areas due to the excess seepage and deep percolation that was occurring prior to making the irrigation system improvements under the salinity control program.

Salinity Wetland Habitat

Wetland habitat types typically suitable for replacement of habitat values forgone include, enhancement or development of small areas of open water associated with shallow water wetlands, palustrine emergent wetlands dominated by emergent wetland plants e.g. bulrush cattails, sedges and rushes, and enhancement of riparian corridors. These habitat improvements are designed to replace wetlands associated with ditch and canal seepage, and poor irrigation water management which are lost with application of salinity irrigation improvements. Prior to introduction of irrigation water in the salinity areas, these types of wetland habitats were only found along and adjacent to riparian corridors.

Habitat Development or Improvement

The salinity wildlife habitat replacement projects are either newly developed habitat or existing habitats enhanced with the application of wildlife habitat improvement practices. The Habitat Evaluation Procedure (HEP) developed by the U.S. Fish and Wildlife Service (USFWS) is used

to determine whether habitat projects meet a threshold level of improvement in change to wildlife values for the target species of concern.

Lower Gunnison Unit – Delta and Montrose Field Offices - Wildlife Habitat Replacement

Based on project reporting the NRCS has reached approximately **58%** of the acreage treatment goal and approximately **72%** of the projected salinity reduction goals in the Lower Gunnison Unit. The goal for each project area is to be concurrent, meaning the wildlife habitat replacement should be adequate to meet the replacement values for the applied irrigation system improvements in place. With **67,016 acres** with irrigation treatment to date, at 2 acres of habitat per 100 acres of irrigation system treatment, the concurrent wildlife habitat replacement goal is **1,340 acres**, see Table 4. With **1,400 acres** of replacement wildlife habitat applied and in place to date, the Lower Gunnison Unit is concurrent with wildlife habitat replacement goals based on the irrigated acres treated to date, and the full project wildlife habitat replacement goal is unknown at this time^{/1}.

^{/1}Depending on how many irrigated acres are ultimately treated for salinity control, it is estimated that the final wildlife habitat replacement goal will be between 1,400 and 2,300 acres.

Lower Gunnison Unit – Delta and Montrose Field Offices - Wildlife Monitoring and Evaluation

Previous years M&E reports have addressed the history of methods used to measure wildlife habitat mitigation efforts for the Salinity Program in detail. These reports are available through NRCS's Colorado web site under the Monitoring and Evaluation Report, Lower Gunnison Unit, Colorado River Salinity Control Program (CRSCP).

The "Salinity Control Act" states that there will be no net loss of wildlife habitat values. The decision was to use a value system to measure impacts to water supported habitats and there can be a net decrease in acres as long as there is no net loss of wildlife habitat values. The habitat value multiplied by the number of acres of that habitat equals the total habitat values lost and/or gained.

Measuring habitat values on every project required a substantial amount of time. A statistical analysis of the habitat evaluation procedure was conducted to streamline the process of evaluating NRCS's wildlife habitat replacement efforts. Data from farms with and without wildlife habitat practices installed were used to extrapolate the number of acres with developed wildlife practices needed to meet the requirement of "no net loss of wildlife habitat values foregone". It was determined that if 25% of all Salinity Control Project contracts installed at least one wildlife habitat practice, habitat value replacement goals would be met. In 2007 there were concerns about the amount of time necessary to conduct an adequate and statistically accurate analysis, and it was jointly decided to base the wildlife habitat replacement goal on 2 acres of habitat per 100 acres of irrigation system improvement. The 2% figure is based in the habitat value

analysis from field evaluations completed in the Grand Valley, Lower Gunnison and McElmo Creek Units.

Lower Gunnison Unit – Delta and Montrose Field Offices - FY 2015 Wildlife Activities

At the time the change was made to go to the 2% replacement amount in FY 2007, 24% of the salinity contracts included wildlife habitat practices. At that time the project was close to being on track with the replacement goals based on the percentage of contracts planning to install wildlife habitat. With the change in goals per the 2% agreement, there has been a lag time to meet the concurrent goaled acreage. Prior to FY 2007 the wildlife acres were tracked and recorded, however the values lost and gained were a combination of habitat quality change and acres. Wildlife habitat values were tracked as the projects achieved a greater value than the wildlife habitat that was lost from the installation of irrigation system.

From FY 2007 to FY 2015, the number of acres with improved irrigation systems increased an average of 2,142 acres per year. To meet the 2 acres of habitat per 100 acres of irrigation treatment requires an average of 43 acres of habitat improvements installed per year. With the additional out-reach and focus on wildlife habitat improvement projects, the field offices have been averaging 78 acres per year of wildlife habitat installed over the same period of time between FY 2007 and FY 2015, which is helping gain on the replacement habitat acres needed to be concurrent. In **FY 2015 162 acres of additional wetland and upland habitat** were reported as applied which is significantly above the 78 acre per year average and achieved the concurrent replacement goal ahead of previous projections.

In FY 2007, when the NRCS and USFWS agreed to the 2 acre per 100 acres wildlife habitat replacement goal, the Lower Gunnison Unit was at 60 percent of the 2% concurrent acreage replacement goal. Over the past several years additional emphasis has been placed on increasing the number and size of wildlife habitat replacement projects. The wildlife habitat replacement totals in Fiscal Years 2009, 2010, 2011 2012, 2013, 2014, and 2015 in the Lower Gunnison Unit increased each year respectively to **60%, 66%, 72%, 81%, 93%, 94%, and 104%** of the **concurrent goaled acres**. This trend is expected to continue into the future, so it is projected the Lower Gunnison Unit will continue to be fully concurrent for the foreseeable future.

The extra effort of the Wildlife Biologists to use program flexibility, focus on projects involving support from multiple wildlife partners, focus on larger more contiguous projects, and increased outreach and program management support are the primary reasons the unit has been making consistent gains in reaching the concurrent goals each of the past 5 years. Continued program support from management and partner agencies is essential to continuing these gains.

Lower Gunnison Unit – Delta and Montrose Field Offices - Future Wildlife Activities and Actions

The offices continue to work with partners on large contiguous blocks of land to improve wildlife habitat. However, because the impacts to wildlife habitats occur throughout the irrigated valleys, emphasis and priority will also continue with any willing landowner that has an eligible wildlife project. The scattered projects improve the juxtaposition of habitat within the farmed landscape.

Starting in FY 2013, the salinity control project is working with the Colorado State Forest Service (CSFS) and the Shavano CD to acquire a Colorado Water Conservation Board (CWCB) invasive phreatophyte control program grant. The goal is to match these funds with EQIP and BSP funds to restore riparian habitat along the Uncompahgre River. Delta County is exploring the potential to restore native woody vegetation to portions of the North Fork of the Gunnison River between Hotchkiss and Paonia, where removal of Russian olive and tamarisk has occurred through funding from grants provided by the National Wild Turkey Federation, Colorado Water Conservation Board, the Delta Conservation District, the Colorado River District, and the Conservation Center. Projects are also coordinated with the USFWS and their Partners for Fish & Wildlife program.

Inventory and assessment of installed projects is necessary to make sure the wildlife habitat is still on the ground and being managed properly. The follow-up also provides an opportunity to assist the landowner with proper management of the habitat. In addition recent aerial photography is used to evaluate the wildlife habitat. Selected projects are field checked to ground truth the installed practices and management.

Table 4 – Lower Gunnison Unit Wildlife Habitat Replacement Table

Habitat Replacement	Acres
Salinity Program Irrigated Acres Treated to Date	67,016
Habitat Replacement Goal @ 2 acres per 100 acres Irrigation Treatment	1,340
Habitat Replacement Acres Applied and Maintained through FY 2014	1,238
Habitat Replacement Acres Applied During FY 2015	162
Total Habitat Replacement Acres Through FY 2015	1,400
Remaining Acres to Meet Concurrent Habitat Replacement Goal	60
Remaining Acres Needed to Meet Full Project Replacement Goal ^{1/}	900

Note the rose colored boxes are negative or a deficit and the green colored box indicates a surplus

^{1/} Assume a full project implementation at 115,000 acres of irrigation treatment at 2.0 acres per 100 acres treated, for a total 2,300 acres of wildlife habitat replacement needed.

As displayed in Table 4, the Lower Gunnison Unit is currently **60 acres** above the concurrent replacement goal and this total acreage amount is a continued improvement over the previous years. Efforts are being made working with other agencies, wildlife groups, and willing landowners to accelerate the rate of replacement and to continue meeting concurrent and future goals.

Table 5 – Lower Gunnison Unit Wildlife Habitat Planned Versus Applied with Funded Contracts

Office		Combined Delta and Montrose Field Offices									
Program	Fiscal Year	Wetland Habitat Planned (ac)	Cumulative Wetland Habitat Planned (ac)	Wetland Habitat Applied (ac)	Cumulative Wetland Habitat Applied (ac)	Cumul. Planned Wetland Applied (%)	Upland Habitat Planned (ac)	Cumulative Upland Habitat Planned (ac)	Upland Habitat Applied (ac)	Cumulative Upland Habitat Applied (ac)	Cumul. Planned Upland Applied (%)
CRSCP	1987-1995	200.3	200.3	126.5	126.5	63%	316.2	316.2	144.2	144.2	46%
IEQIP/EQIP	1996-2006	166.6	166.6	97.8	97.8	59%	562.1	562.1	329.4	329.4	59%
EQIP	2007-2014	45.8	45.8	21.8	21.8	^{1/}	521.0	521.0	282.7	282.7	^{1/}
	2015	10.5	56.3	18.4	40.2	^{1/}	103.0	624.0	143.6	426.3	^{1/}
BSP/BSPP	1997-2014	65.5	65.5	56.1	56.1	86%	194.7	194.7	179.8	179.8	92%
BSP/BSPP	2015	0.0	65.5	0.0	56.1	^{1/}	0.0	194.7	0.0	179.8	^{1/}
Total			488.7		320.6			1,697.0		1079.7	
Total Habitat Replacement Acres Applied											1,400.3

Note: Each of the program yearly incremental cumulatives are the bold numbers in the darker green boxes.

^{1/} The majority of the FY 2007 through FY 2015 contracts are active and practices are still being applied. The planned versus applied percentage is not applicable until the majority of the contracts have been completed.

Table 6 – Lower Gunnison Unit Salinity Wildlife Funding NRCS On-Farm Programs

CRSCP/EQIP/ I-EQIP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 1988 to FY 2014	\$65,352,700
Funds Obligated to Salinity FY 2015	\$3,878,195
Funds Obligated to Wildlife Projects FY 1988 to FY 2014	\$1,946,952
Funds Obligated to Wildlife Projects FY 2014	\$194,476
Funds Spent on Wildlife Projects FY 1988 to FY 2014	\$1,019,492
Funds Spent on Wildlife Projects FY 2015	\$14,133
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 1988 to FY 2015	3.1%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 1988 to FY 2015	1.5%

Table 7 – Lower Gunnison Unit Salinity Wildlife Funding BSP/BSPP On-Farm Programs

BSP/BSPP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 1997 to FY 2014	\$5,497,455
Funds Obligated to Salinity FY 2015	\$0
Funds Obligated to Wildlife Projects FY 1997 to FY 2014	\$397,616
Funds Obligated to Wildlife Projects FY 2015	\$143,158
Funds Spent on Wildlife Projects FY 1997 to FY 2014	\$306,039
Funds Spent on Wildlife Projects FY 2015	\$82,942
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 1997 to FY 2015	9.8%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 1997 to FY 2015	7.1%

Table 8 – Lower Gunnison Unit Salinity Wildlife Funding All On-Farm Programs

All Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 1988 to FY 2014	\$70,850,155
Funds Obligated to Salinity FY 2015	\$3,878,195
Funds Obligated to Wildlife Projects FY 1988 to FY 2014	\$2,344,568
Funds Obligated to Wildlife Projects FY 2014	\$337,634
Funds Spent on Wildlife Projects FY 1988 to FY 2014	\$1,325,531
Funds Spent on Wildlife Projects FY 2015	\$97,075
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 1988 to FY 2015	3.6%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 1988 to FY 2015	1.9%

Lower Gunnison Unit – Delta and Montrose Field Offices - Wildlife Habitat Funding Discussion

The dollars spent at any given time will always be lower than the obligated funds due to unexpended funds in active contracts pending practice installation, delays between practice installation and practice certification with payment, and using estimated costs that obligate more funds than are typically needed to install all of the habitat improvements. The differences displayed in the tables above are likely due to the estimated versus actual costs and the active contracts that have not currently applied all of the practices scheduled to earn incentive payments.

During the early implementation years of the program many operators reluctantly agreed to make small and typically expensive habitat improvements as a condition to getting the funding for their irrigation improvements. Many applicants fulfilled this agreement, but a number eventually canceled or never installed the scheduled habitat improvements, so the money was obligated but never spent. This appears to have been more common in the Delta service area and appears to have not been as much of an issue in the Montrose service area. This trend was part of what necessitated the changes in how projects approached the wildlife habitat replacement agreements under salinity control. The rates of obligated versus expended funds for wildlife have been improving significantly with this new approach.

Lower Gunnison Unit – Delta and Montrose Field Offices - Wildlife Habitat Replacement Summary and Conclusions

The wildlife habitat replacement goal is 2% of the acres treated for salinity. To date **67,016 acres** have been treated with salinity practices. To be concurrent with project application, **1,340 acres** of wildlife habitat replacement should currently be on the ground and functioning. To date **1,400 acres** of wildlife habitat replacement are applied on the ground and functioning. The project is currently at approximately **104%** of the concurrent wildlife habitat replacement goals. Biologists conduct field checks of wildlife projects to ensure they are still present and functioning. These periodic checks result in some acres being removed from the wildlife habitat replacement acres applied. So while wildlife replacement acres are continually being installed, some acres are being lost. Urban development, changes in management or land ownership, and contracts that are past their effective lifespan are major reasons that some acres no longer met wildlife habitat replacement criteria and have been removed from the annual accounting system

NRCS is currently **60 acres** above the concurrent wildlife habitat replacement goal. To continue to remain concurrent with salinity project implementation, NRCS will continue to place a high priority on wildlife habitat replacement in the Lower Gunnison Unit.

To increase the level and quality of wildlife replacement projects the NRCS is focusing on contracting wildlife only projects rather than trying to incorporate a combined salinity control and wildlife project contract. In general the focused approach for wildlife contracts helps find willing and motivated producers who actively engage in larger higher quality projects, they install practices on schedule, have fewer cancelations, and provide a higher level of management and maintenance. NRCS has also been given the flexibility to use certain funding sources, in particular the Basin States Program to pursue non-agricultural producer landowners that are interested in developing and managing wildlife habitat. In addition, NRCS pursues funding from other state, federal and private conservation organizations. This results in greater leveraging of limited funds and eliminates financial obstacles for the landowner.

In summary, the Lower Gunnison Unit is meeting their concurrent acreage replacement goals, since significant gains have been made each of the past few years. It is assumed this trend will continue in the future, so the project will continue to be concurrent in future years. The shift to wildlife only contracts, allowing the field office biologists to focus on these high priority projects, and the program flexibility to work with non-traditional producers, and a higher level of partnering with other agencies is enabling the Lower Gunnison Unit to fully meet their wildlife habitat replacement goals.

McElmo Creek Unit – Cortez Field Office - Wildlife Habitat Replacement

Based on project reporting the NRCS has reached approximately **74%** of the acreage treatment goal at **15,897 acres** and approximately **61%** of the projected salinity reduction treatment goals for the McElmo Creek Unit. The goal for each project area is to be concurrent, meaning the wildlife habitat replacement should be adequate to meet the replacement values for the applied irrigation system improvements in place. To date at 2 acres of habitat per 100 acres of irrigation system treatment the concurrent wildlife habitat replacement goal is **318 acres**, see Table 9. Based on the ongoing assessment and field inventory of suitable wildlife habitat replacement project applied and still being maintained, there have been **280 acres** of wildlife habitat replacement confirmed through FY 2015 and is **38 acres** short of meeting concurrent wildlife habitat replacement goal.

The final results of the habitat inventory and evaluation indicates the project area does not have sufficient wildlife habitat replacement projects still being maintained to be concurrent, and there is not enough suitable wildlife habitat replacement acres in place to meet the full wildlife habitat replacement goal at the time of project completion. Additional emphasis will be needed to find landowners willing to provide suitable wildlife habitat replacement projects sufficient to meet future concurrent and final project implementation goals.

Table 9 – McElmo Creek Unit Wildlife Habitat Replacement Table

Habitat Replacement	Acres
Salinity Program Irrigated Acres Treated to Date	15,897
Habitat Replacement Goal @ 2 acres per 100 acres Irrigation Treatment	318
Habitat Replacement Acres Applied and Maintained through FY 2014	268
Habitat Replacement Acres Applied During FY 2015	12
Total Habitat Replacement Acres Through FY 2015	280
Remaining Acres to Meet Concurrent Habitat Replacement Goal	38
Remaining Acres Needed to Meet Full Project Replacement Goal ^{1/}	151

Note the rose colored boxes are negative or a deficit and the green colored box indicates a surplus

^{1/} Assume a full project implementation at 21,550 acres of irrigation treatment at 2.0 acres per 100 acres treated, for a total 431 acres of habitat replacement needed.

Table 10 – McElmo Creek Unit Wildlife Habitat Planned Versus Applied with Funded Contracts

Program	Fiscal Year	Wetland Habitat Planned (ac)	Cumulative Wetland Habitat Planned (ac)	Wetland Habitat Applied (ac)	Cumulative Wetland Habitat Applied (ac)	Cumulative Planned Wetland Applied (%)	Upland Habitat Planned (ac)	Cumulative Upland Habitat Planned (ac)	Upland Habitat Applied (ac)	Cumulative Upland Habitat Applied (ac)	Cumulative Planned Upland Applied (%)
CRSCP	1989-1996	297.3	297.3	165.2	165.2	56%	277.8	277.8	152.9	152.9	55%
IEQIP/EQIP	1996 - 2006	93.3	93.3	42.3	42.3	45%	494.1	494.1	450.4	450.4	91%
EQIP	2007-2014	133.6	153.1	60.4	60.4	^{1/}	206.5	206.5	206.5	0.0	^{1/}
	2015	12.0	165.1	12.0	72.4	^{1/}	0.0	206.5	0.0	0.0	^{1/}
BSP/BSPP	1989-2014	0.0	0.0	0.0	0.0	na	0.0	0.0	0.0	0.0	na
BSP/BSPP	2015	0.0	0.0	0.0	0.0	^{1/}	0.0	0.0	0.0	0.0	^{1/}
	Total		555.7		279.9	32%		978.4	^{2/}	^{2/}	^{1/}
Total Habitat Replacement Acres Applied and Maintained											280
Note: Each of the program yearly incremental cumulatives are the bold numbers in the darker green boxes.											

^{1/} The majority of the FY 2007 though FY 2015 contracts are active and practices are still being applied. The planned versus applied percentage is not applicable until the majority of the contracts have been completed.

^{2/} To date no upland habitat acres planned and applied have been counted as meeting suitable salinity wildlife habitat replacement.

Table 11 – McElmo Creek Unit Salinity Wildlife Funding NRCS On-Farm Programs

CRSCP/EQIP/ I-EQIP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 1989 to FY 2014	\$15,671,606
Funds Obligated to Salinity FY 2015	\$1,202,608
Funds Obligated to Wildlife Projects FY 1989 to FY 2014	\$193,772
Funds Obligated to Wildlife Projects FY 2015	\$6,505
Funds Spent on Wildlife Projects FY 1989 to FY 2014	\$169,429
Funds Spent on Wildlife Projects FY 2015	\$6,650
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 1989 to FY 2015	1.2%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 1989 to FY 2015	1.0%

Table 12 – McElmo Creek Unit Salinity Wildlife Funding BSP/BSPP On-Farm Programs

BSP/BSPP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 1997 to FY 2014	\$3,385,883
Funds Obligated to Salinity FY 2015	\$0
Funds Obligated to Wildlife Projects FY 1997 to FY 2014	\$0
Funds Obligated to Wildlife Projects FY 2015	\$0
Funds Spent on Wildlife Projects FY 1997 to FY 2014	\$0
Funds Spent on Wildlife Projects FY 2015	\$0
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 1997 to FY 2015	0.0%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 1997 to FY 2015	0.0%

Table 13 – McElmo Creek Unit Salinity Wildlife Funding All On-Farm Programs

All Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 1989 to FY 2014	\$19,057,489
Funds Obligated to Salinity FY 2015	\$1,202,608
Funds Obligated to Wildlife Projects FY 1989 to FY 2014	\$193,772
Funds Obligated to Wildlife Projects FY 2015	\$6,505
Funds Spent on Wildlife Projects FY 1989 to FY 2014	\$169,429
Funds Spent on Wildlife Projects FY 2015	\$6,650
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 1989 to FY 2015	1.0%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 1989 to FY 2015	0.9%

McElmo Creek Unit Wildlife Habitat Funding Discussion

The dollars spent at any given time will always be lower than the obligated funds due to unexpended funds in active contracts pending practice installation, delays between practice installation and practice certification with payment, and using estimated costs that obligate more funds than are typically needed to install all of the habitat improvements. The differences displayed in the tables above are likely due to the estimated versus actual costs and the active contracts that have not currently applied all of the practices scheduled to earn incentive payments.

During the early implementation years of the program many operators reluctantly agreed to make small and typically expensive habitat improvements as a condition to getting the funding for their irrigation improvements. Many applicants fulfilled this agreement, but a number eventually

canceled or never installed the scheduled habitat improvements, so the money was obligated but never spent. This unfortunate trend was part of what necessitated the changes in how projects approached the wildlife habitat replacement agreements under salinity control. The rates of obligated versus expended funds for wildlife have been improving significantly with this new approach.

To date the McElmo Creek Unit has not found it necessary to utilize the BSP/BSPP funding to meet the wildlife habitat replacement funding needs. The BSP funding is helpful for replacement projects with applicants that do not meet the EQIP program eligibility requirements and have been utilized to fund numerous wildlife habitat replacement projects in other salinity control units in western Colorado.

McElmo Creek Unit - Wildlife Habitat Assessment and Tracking

Starting in FY 2013 and continuing into FY 2015 the NRCS Partner Biologist conducted a review of wildlife habitat replacement projects to determine their current status and the overall replacement status for the McElmo Creek Unit. This was necessary as other local field staff retired and some of the tracking records were partial or incomplete. During the initial review steps, it became clear many of the project files were not retained or misplaced resulting in incomplete information for project review.

Interim-EQIP and EQIP wildlife habitat replacement projects from 1996-2015 with active files available were reviewed first. On-site field visits were completed for 45 projects in the McElmo Creek Unit, of which 25 of the reviewed projects had 100 acres of suitable replacement habitat in place, and the remaining 20 projects were either cancelled with practices deleted, or are upland projects that do not meet salinity replacement requirements, or the habitat improvements have been lost due to development or other land-use changes.

In addition the review was able to recover 231 old irrigation improvement and/or wildlife habitat projects funded under the Colorado River Salinity Control Program (CRSCP) from 1989-1996, of which 70 projects appear to have some type of salinity wildlife habitat replacement planned. Of these 231 projects, 25 were documented as cancelled or practices deleted. Of the 231 old projects, 136 projects reported some type of net habitat value lost from the salinity irrigation improvements.

The review did not confirm any of the previously reported upland habitat projects still exist or meet suitable salinity habitat replacement requirements. The net result of the review confirmed 267.9 acres of previously applied wildlife habitat projects from all salinity funding sources meet salinity wildlife habitat replacement requirements as applied and maintained.

In FY 2015 an additional **12.0 acres** of suitable wildlife habitat replacement were reported as applied, so the current total is the **268 acres** confirmed from the previous projects, plus the current year implementation for a total of **280 acres** of suitable salinity habitat replacement confirmed.

McElmo Creek Unit Wildlife Habitat Replacement Summary and Conclusions

The wildlife habitat replacement goal is 2% of the acres treated for salinity. To date **15,897 acres** have been treated with salinity control practices. To be concurrent with project application, **318 acres** of wildlife habitat replacement should currently be on the ground and functioning. To date **280 acres** of wildlife habitat replacement are reported as applied and maintained on the ground.

The project is currently at approximately **88%** of the concurrent wildlife habitat replacement goal. Urban development, changes in management and changes in land ownership are major reasons that some acres no longer met wildlife habitat replacement criteria and may need to be removed from the accounting system. In 2015, **0.5 acres** of wildlife habitat replacement were planned and **12.0 acres** of habitat were reported as applied.

The project does not meet concurrent replacement goals in McElmo Creek. To assure the current project status and to be concurrent with salinity project implementation, NRCS will need to continue periodic field inventories and assure the habitat projects are managed and maintained to meet the goal of replacing habitat values foregone for the duration of the on-farm portion of the Colorado River Salinity Control Program. The current proposed schedule is a field review at least once every three (3) years while the project is considered active to assess the habitat project status, management, and operation and maintenance. Emphasis will need to continue on promoting additional salinity wildlife habitat replacement projects to meet current and future habitat replacement goals.

Mancos Valley Unit – Cortez Field Office - Wildlife Habitat Replacement

Based on project reporting the NRCS has reached approximately **51%** of the acreage treatment goal at **2,748 acres** and approximately **37%** of the projected salinity reduction treatment goals for the Mancos Valley Unit. To be concurrent with project application, **55 acres** of wildlife habitat replacement should currently be on the ground and functioning. To date **103 acres** of wildlife habitat replacement are reported as applied on the ground. The Mancos Valley Unit **exceeds** the concurrent wildlife habitat replacement goal by **47 acres** of wetland habitat.

The habitat inventory and evaluation the project area is complete and may almost have enough acres in place to meet the NRCS wildlife habitat replacement goals at the time of project completion ^{1/}.

^{1/}Depending on how many irrigated acres are ultimately treated for salinity control, it is estimated that the final wildlife habitat replacement goal will be approximately 108 acres dependent on the final irrigated acres treated.

Table 14 – Mancos Valley Unit Wildlife Habitat Replacement Table

Habitat Replacement	Acres
Salinity Program Irrigated Acres Treated to Date	2,748
Habitat Replacement Goal @ 2 acres per 100 acres Irrigation Treatment	55
Habitat Replacement Acres Applied and Maintained through FY 2014	103
Habitat Replacement Acres Applied During FY 2015	5
Total Habitat Replacement Acres Through FY 2015	107
Remaining Acres to Meet Concurrent Habitat Replacement Goal	52
Remaining Acres Needed to Meet Full Project Replacement Goal ^{1/}	1

Note the rose colored boxes are negative or a deficit and the green colored box indicates a surplus

Note, the actual number of number of applied acres is 102.9, and the current year applied acres is 4.5, for a total of 107.4 acres. Thus the total number of acres through FY 2015 rounded to 107 rather than 108.

^{1/} Assume a full project implementation at 5,400 acres of irrigation treatment at 2 acres per 100 acres irrigation improvement, for a total 108 acres of wildlife habitat replacement needed, or the current habitat acres are sufficient to meet 99% of the full project replacement goal.

Based on the results of the wildlife habitat field assessment, the Mancos Valley Unit is **concurrent** with the wildlife habitat replacement acres needed.

Table 15 – Mancos Valley Unit Wildlife Habitat Planned Versus Applied with Funded Contracts

Program	Fiscal Year	Wetland Habitat Planned (ac)	Cumulative Wetland Habitat Planned (ac)	Wetland Habitat Applied (ac)	Cumulative Wetland Habitat Applied (ac)	Cumulative Planned Wetland Applied (%)	Upland Habitat Planned (ac)	Cumulative Upland Habitat Planned (ac)	Upland Habitat Applied (ac)	Cumulative Upland Habitat Applied (ac)	Cumulative Planned Upland Applied (%)
EQIP	2004 - 2006	19.5	19.5	17.8	17.8	87%	467.6	467.6	396.1	396.1	85%
EQIP	2007-2014	235.5	240.5	85.1	85.1	^{1/}	152.0	152.0	186.3	186.3	^{1/}
	2015	0.0	240.5	4.5	89.6	^{1/}	0.0	152.0	0.0	186.3	^{1/}
BSP/BSPP	2004-2014	0.0	0.0	0.0	0.0	na	0.0	0.0	0.0	0.0	na
BSP/BSPP	2015	0.0	0.0	0.0	0.0	^{1/}	0.0	0.0	0.0	0.0	^{1/}
	Total		260.0		107.4	41%		619.6	^{2/}	^{2/}	^{2/}
Total Habitat Replacement Acres Applied											107
Note: Each of the program yearly incremental cumulatives are the bold numbers in the darker green boxes.											

^{1/} The majority of the FY 2007 though FY 2015 contracts are active and practices are still being applied. The planned versus applied percentage is not applicable until the majority of the contracts have been completed.

^{2/} To date, no upland habitat acres planned and applied have been counted as meeting suitable salinity wildlife habitat replacement.

Table 16 – Mancos Valley Unit Salinity Wildlife Funding NRCS On-Farm Programs

CRSCP/EQIP/ I-EQIP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 2004 to FY 2014	\$5,097,183
Funds Obligated to Salinity FY2015	\$314,503
Funds Obligated to Wildlife Projects FY 2004 to FY 2014	\$292,255
Funds Obligated to Wildlife Projects FY 2015	\$0
Funds Spent on Wildlife Projects FY 2004 to FY 2014	\$179,569
Funds Spent on Wildlife Projects FY 2015	\$4,583
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 2004 to FY 2015	5.4%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 2004 to FY 2015	3.4%

Table 17 – Mancos Valley Unit Salinity Wildlife Funding BSP/BSPP On-Farm Programs

BSP/BSPP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 2004 to FY 2014	\$472,575
Funds Obligated to Salinity FY2015	\$0
Funds Obligated to Wildlife Projects FY 2004 to FY 2014	\$0
Funds Obligated to Wildlife Projects FY 2015	\$0
Funds Spent on Wildlife Projects FY 2004 to FY 2014	\$0
Funds Spent on Wildlife Projects FY 2015	\$0
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 2004 to FY 2015	0.0%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 2004 to FY 2015	0.0%

Table 18 – Mancos Valley Unit Salinity Wildlife Funding All On-Farm Programs

All Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 2004 to FY 2014	\$5,569,758
Funds Obligated to Salinity FY2015	\$314,503
Funds Obligated to Wildlife Projects FY 2004 to FY 2014	\$292,255
Funds Obligated to Wildlife Projects FY 2015	\$0
Funds Spent on Wildlife Projects FY 2004 to FY 2014	\$179,569
Funds Spent on Wildlife Projects FY 2015	\$4,583
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 2004 to FY 2015	5.0%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 2004 to FY 2015	3.1%

Mancos Valley Unit Wildlife Habitat Funding Discussion

The dollars spent at any given time will always be lower than the obligated funds due to unexpended funds in active contracts pending practice installation, delays between practice installation and practice certification with payment, and using estimated costs that obligate more funds than are typically needed to install all of the habitat improvements. The differences displayed in the tables above are likely due to the estimated versus actual costs and the active contracts that have not currently applied all of the practices scheduled to earn incentive payments.

To date the Mancos Valley Unit has not found it necessary to utilize the BSP/BSPP funding to meet the wildlife habitat replacement funding needs. The BSP funding is helpful for replacement projects with applicants that do not meet the EQIP program eligibility requirements and have been utilized to fund numerous wildlife habitat replacement projects in other salinity control units in western Colorado.

Mancos Valley - Wildlife Habitat Assessment and Tracking

Starting in FY 2013 and continuing into FY 2015 the NRCS Partner Biologist conducted a review wildlife habitat replacement projects to determine their current status and the overall replacement status for the Mancos Valley Unit. This was necessary since other local field staff retired and some of the tracking records were partial or incomplete.

During the initial review, it became clear many of the wildlife habitat replacement projects did not have a current field status review, so it was unknown whether the habitat projects were still being managed and maintained as suitable salinity wildlife habitat replacement projects. In addition upland wildlife habitat projects had been reported previously as extra habitat acres. Although, it was never determined whether any of the upland acres were suitable wildlife habitat replacement acres, so they were never counted toward meeting salinity replacement acreage

requirements. A field review of all the habitat projects was conducted to determine the current status and suitability for replacement of salinity habitat values forgone.

The Mancos Valley Unit has been operating under EQIP starting in FY 2004, and to date all 16 habitat projects reported as applied have been field reviewed with a total of **102.9 acres** of suitable salinity replacement habitat confirmed. The unit originally reported **137 acres** of salinity wildlife habitat replacement as applied, however three projects contain upland type habitats that have not been determined to be suitable salinity habitat replacement projects. In addition a few of the other wildlife habitat replacement projects had slightly reduced acres confirmed as suitable replacement habitat based on measured size adjustments from the field reviews. This combination of adjustments resulted in a net reduction from the 137 acres originally reported to the 102.9 acres confirmed.

The tracking review and field assessment is complete for the Mancos Valley Unit. In addition a database of the habitat projects will facilitate future tracking that will be done on a three year basis, and the Field Office will have the records necessary to more easily track and report on the current wildlife habitat replacement status.

In FY 2015 an additional **4.5 acres** of salinity habitat replacement was applied for a total current replacement of **107.4 acres**.

Mancos Valley Unit Wildlife Habitat Replacement Summary and Conclusions

The wildlife habitat replacement goal is 2% of the acres treated for salinity. To date **2,748 acres** have been treated with salinity control practices. To be concurrent with project application, **55 acres** of wildlife habitat replacement should currently be on the ground and functioning. To date **107 acres** of wetland habitat replacement are reported as applied on the ground. The Mancos Valley Unit exceeds the concurrent wildlife habitat replacement goal by **52 acres**.

Based on the final determinations from the field inventory, the project is concurrent with wildlife habitat replacement goals and potentially is at **99%** for full project replacement goals. Urban development, changes in management, and changes in land ownership are major reasons that some acres no longer met wildlife habitat replacement criteria and may need to be removed from the accounting system. In 2015, **4.5 acres** of salinity wildlife habitat replacement were applied, and no new acres of habitat were reported as planned.

To assure the current project status and to stay concurrent with salinity project implementation, NRCS will need to continue periodic field inventories assure the habitat projects are managed and maintained to meet the goal of replacing habitat values foregone for the duration of the on-farm portion of the Colorado River Salinity Control Program. The current proposed schedule is a field review at least once every three (3) years to while the project is considered active to assess the habitat project status, management, and operation and maintenance.

Silt Unit Wildlife Habitat Replacement

Based on project reporting the NRCS has reached approximately **59%** of the acreage treatment goal and approximately **57%** of the projected salinity reduction treatment goals identified in the project plan ^{/1}. The goal for each project area is to be concurrent, meaning the wildlife habitat replacement should be adequate to meet the replacement values for the applied irrigation system improvements in place, or approximately **29 acres** of wildlife habitat replacement is needed to be concurrent in FY 2015 ^{/2}. The Silt Unit currently reports **19.4 acres** of replacement habitat applied or the Unit is about **10 acres** short of meeting the concurrent wildlife habitat goal and is potentially **31 acres** ^{/3} short of meeting the full project wildlife habitat replacement goals (see Table 19).

^{/1} Silt Salinity Control Project Plan and Environmental Assessment, USDA-NRCS, December 2005

^{/2} The Silt Unit concurrent value is based on the acres treated divided by the planned treatment acres, times the 50 acres of proposed wildlife habitat replacement, $(1,712 \text{ ac} / 2,800 \text{ ac}) \times 50 \text{ ac} = 30.6 \text{ acres}$ of wildlife habitat replacement to be concurrent. The percentage concurrent is based on the FY 2015 reported wildlife habitat replacement acres divided by the concurrent acres, $19.4 \text{ ac} / 28.6 \text{ ac} = 63\%$ concurrent.

^{/3} Depending on how many irrigated acres are ultimately treated for salinity control, it is estimated that the final wildlife habitat replacement goal will be 10 acres of wetland and 40 acres of riparian/upland developed and or significantly enhanced.

Silt Unit FY 2015 Wildlife Habitat Replacement Activities

In FY 2015 only a few landowners were potentially interested in wildlife habitat contracts. The potential projects were reviewed by the NRCS biologist to evaluate which projects could provide suitable salinity wildlife habitat replacement. During the initial assessments options were reviewed with the prospective clients on projects and management, but to date none have submitted an application for a salinity program wildlife contract. The NRCS and the Bookcliff Conservation District continued to work with these landowners to see if the follow-up will generate additional interest in wildlife habitat contracts that meet salinity program wildlife habitat replacement requirements.

The NRCS and Bookcliff Conservation District also worked with the Colorado Parks and Wildlife's Habitat Partnership Program to see if they were aware of any potential applicants in the project area that could utilize the available salinity program funding to help implement wildlife habitat development or enhancement projects. Possible projects were discussed, but to date none have generated a program application.

NRCS continues to work with the current wildlife habitat replacement contract to improve the habitat areas adjacent to the installed pond, and to plan with the landowner and to prepare designs for installation of another pond with adjacent wildlife habitat. The continued management plan around the two ponds will exclude cattle and forage harvest to improve wildlife cover benefits

Table 19 – Silt Unit Wildlife Habitat Replacement Table

Habitat Replacement	Acres
Salinity Program Irrigated Acres Treated to Date	1,712
Habitat Replacement Goal ^{1/}	50
Habitat Replacement Acres Applied and Maintained through FY 2012	19
Habitat Replacement Acres Applied During FY 2015	0
Total Habitat Replacement Acres Through FY 2015	19
Remaining Acres to Meet Concurrent Habitat Replacement Goal ^{1/}	12
Remaining Acres Needed to Meet Full Project Replacement Goal ^{2/}	31

Note the rose colored boxes are negative or a deficit and the green colored box indicates a surplus

^{1/} The Silt wildlife habitat replacement goal is set at 10 acres of wetland replacement and 40 acres of riparian/upland replacement for a total goal of 50 acres, per the published “Silt Salinity Control Project Plan and Environmental Assessment, USDA-NRCS, December 2005”.

^{2/} Assume a full project implementation at 2,800 acres of irrigation treatment, concurrent wildlife habitat replacement at (1,712 ac. /2,800 ac.) X 50 ac = 31 acres.

To date the Silt Unit is **12 acres below** the concurrent replacement amount needed. Efforts are being made working with other agencies, wildlife groups, and willing landowners to accelerate the rate of replacement to meet concurrent and future goals.

While the goal for wildlife habitat replacement is to be concurrent with irrigation improvements, it must also be understood that the hydrologic effects of the irrigation improvements and the wildlife benefits from developing fully functional wildlife habitat may take several years to be fully realized. Although some habitat losses from irrigation improvements are immediate, such as removal of ditch bank vegetation, other losses occur over time as the hydrologic effects of reduced ditch seepage and excess deep percolation change the net flow of subsurface water. The full hydrologic impacts of reducing excess seepage and deep percolation may take a period of time sufficient to change and/or eliminate wetland or riparian vegetation completely. Similarly, it will take several years for replacement wildlife habitat to become fully functional.

Table 20– Silt Unit Wildlife Habitat Planned and Applied with Funded Contracts

Program	Fiscal Year	Wetland Habitat Planned (ac)	Cumulative Wetland Habitat Planned (ac)	Wetland Habitat Applied (ac)	Cumulative Wetland Habitat Applied (ac)	Cumulative Planned Wetland Applied (%)	Upland Habitat Planned (ac)	Cumulative Upland Habitat Planned (ac)	Upland Habitat Applied (ac)	Cumulative Upland Habitat Applied (ac)	Cumulative Planned Upland Applied (%)
EQIP	2005 - 2006	0.0	0.0	0.0	0.0	na	0.0	0.0	0.0	0.0	na
EQIP	2007-2014	0.0	0.0	0.0	0.0	^{1/}	19.4	19.4	19.4	19.4	^{1/}
	2015	0.0	0.0	0.0	0.0	^{1/}	0.0	19.4	0.0	19.4	^{1/}
BSP/BSPP	2005-2014	0.0	0.0	0.0	0.0	na	0.0	0.0	0.0	0.0	na
BSP/BSPP	2015	0.0	0.0	0.0	0.0	^{1/}	0.0	0.0	0.0	0.0	^{1/}
	Total		0.0		0.0	na		19.4		19.4	100%
Total Habitat Replacement Acres Applied											19.4
Note: Each of the program yearly incremental cumulatives are the bold numbers in the darker green boxes.											

^{1/} The majority of the FY 2007 through FY 2015 contracts are active and practices are still being applied. The planned versus applied percentage is not applicable until the majority of the contracts have been completed.

Table 21 – Silt Unit Salinity Wildlife Funding NRCS On-Farm Programs

CRSCP/EQIP/ I-EQIP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 2005 to FY 2014	\$1,413,877
Funds Obligated to Salinity FY 2015	\$110,969
Funds Obligated to Wildlife Projects FY 2005 to FY 2014	\$39,959
Funds Obligated to Wildlife Projects FY 2015	\$0
Funds Spent on Wildlife Projects FY 2005 to FY 2014	\$33,659
Funds Spent on Wildlife Projects FY 2015	\$0
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 2005 to FY 2015	2.6%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 2005 to FY2015	2.2%

Table 22 – Silt Unit Salinity Wildlife Funding BSP/BSPP On-Farm Programs

BSP/BSPP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 2005 to FY 2014	\$1,030,699
Funds Obligated to Salinity FY 2015	\$0
Funds Obligated to Wildlife Projects FY 2005 to FY 2014	\$0
Funds Obligated to Wildlife Projects FY 2015	\$0
Funds Spent on Wildlife Projects FY 2005 to FY 2014	\$0
Funds Spent on Wildlife Projects FY 2015	\$0
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 2005 to FY 2015	0.0%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 2005 to FY2015	0.0%

Table 23 – Silt Unit Salinity Wildlife Funding All On-Farm Programs

All Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 2005 to FY 2014	\$2,444,576
Funds Obligated to Salinity FY 2015	\$110,969
Funds Obligated to Wildlife Projects FY 2005 to FY 2014	\$39,959
Funds Obligated to Wildlife Projects FY 2015	\$0
Funds Spent on Wildlife Projects FY 2005 to FY 2014	\$33,659
Funds Spent on Wildlife Projects FY 2015	\$0
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 2005 to FY 2015	1.6%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 2005 to FY2015	1.3%

Silt Unit Wildlife Habitat Funding Discussion

The dollars spent at any given time will always be lower than the obligated funds due to unexpended funds in active contracts pending practice installation, delays between practice installation and practice certification with payment, and using estimated costs that obligate more funds than are typically needed to install all of the habitat improvements. The differences displayed in the tables above are likely due to the estimated versus actual costs and the active contracts that have not currently applied all of the practices scheduled to earn incentive payments.

To date the Silt Unit has not found it necessary to utilize the BSP/BSPP funding to meet the wildlife habitat replacement funding needs. The BSP funding is helpful for replacement projects with

applicants that do not meet the EQIP program eligibility requirements and have been utilized to fund numerous wildlife habitat replacement projects in other salinity control units in western Colorado.

Silt Unit Wildlife Habitat Replacement Summary and Conclusions

The wildlife habitat replacement goal for Silt Unit is **10 acres** of wetland habitat and **40 acres** of riparian/upland habitat. To date **1,712 acres** have been treated with salinity control practices. To be concurrent with project application, **31 acres** of wildlife habitat replacement should be on the ground and maintained. To date **19.4 acres** of riparian/upland wildlife habitat replacement are reported as applied.

The Silt Unit project is currently below the concurrent wildlife habitat replacement goals, and efforts are needed to increase the number of planned and applied habitat projects. In addition small acreage development, changes in management and changes in land ownership may cause losses to wildlife habitat replacement that may ultimately need to be removed from the accounting system. In 2015, no new acres of wildlife habitat replacement were planned and no new acres of habitat were reported as applied. Pending the final determinations from the irrigated field inventory, the Silt Unit will need additional wildlife habitat replacement acreage to be concurrent and may be significantly below the final habitat acreage needed to meet full project replacement goals.

The NRCS will need to continue periodic field inventories to assure habitat projects are managed and maintained to meet the goal of replacing habitat values foregone for the duration of the on-farm portion of the Colorado River Salinity Control Program. The recommended schedule is a re-assessment at least once every three (3) years while the project is considered active to provide the landowner with management assistance if needed and to assure the salinity replacement habitats are being operated and maintained as planned.

Grand Valley Unit Completed Project – Grand Junction Field Office - Wildlife Habitat Replacement

Note, the Wildlife Habitat Replacement section will be continued for the Grand Valley Unit Completed Project until the wildlife habitat replacement goal has been achieved. The completion of the formal on-farm salinity control goal does not reduce or change the priority of accomplishing all of the agreed-to salinity wildlife habitat replacement goals. It is important to continue providing the information contained in this section to detail the efforts and progress being made to achieve this important project goal. After the initial habitat goal is accomplished, the follow-up wildlife habitat support efforts will be highlighted for the completed project in the Executive Summary and the Grand Valley Unit Completed Project Key Considerations and Conclusions, and Future Outlook sections.

Since FY 1979 five salinity programs have been utilized to replace wildlife values foregone (Table 3). A majority of the successful replacement efforts have been a result of the CRSCP and BSP/BSPP salinity programs. The EQIP program has only produced a net 86 acres of

wildlife habitat replacement in 12 years. During the first 7 years of the EQIP program, wildlife and irrigation projects were encouraged with each landowner and were combined in a single contract with their salinity control work, and there was a high cancellation rate for the wildlife portions of the contract. Since FY 2004, all wildlife contracts under EQIP are separate contracts and cancellation rates have decreased significantly.

During FY 2015, no new acres of wildlife habitat replacement were applied (Table 25). Including FY 2015 the NRCS replacement effort has resulted in a net **423 acres** of wildlife habitat applied and existing. The applied and existing acres account for about 25% of all planned habitat projects. In addition, in the Grand Valley Unit USBR completed significant delivery system improvement projects and agreed, as part of the combined off-farm on-farm irrigation improvement project, to provide part of the replacement acres for the NRCS on-farm projects. To meet this agreement the USBR purchased **355 acres** and developed wildlife habitat in the Grand Valley Unit to offset a portion of the NRCS wildlife habitat replacement obligation. This 355 acre offset combined with NRCS funded projects has resulted in a total of 778 acres of replacement wildlife habitat developed or significantly enhanced in the Grand Valley Unit.

The current wildlife habitat replacement goal for the combined Grand Valley Unit is at **1,206 acres** with the inclusion of the acres needed to cover the Whitewater and DeBeque irrigation improvements to date. Based on project reporting the NRCS has reached approximately **100%** of the acreage treatment goal at **42,860 acres** and approximately **108%** of the projected salinity reduction goals in the Grand Valley Unit. To date **778 acres** of habitat have been applied and are being maintained. The Grand Valley Unit needs **1,206 acres** of wildlife habitat replacement to meet the concurrent and final wildlife habitat replacement goal, so the project area is still **428 acres** short of reaching both the concurrent and final goal (see Table 24).

The Grand Valley wildlife habitat site monitoring consist of an initial “drive by” by a trained Wildlife Biologist to determine if the project appears to continue to meet the habitat objectives stated in the plan. If the condition of the habitat project cannot be easily determined by a quick look at the project or the habitat project is not readily visible by vehicle access, then a “walk through” of the project is conducted to evaluate the visible habitat condition. Habitat evaluation models are used if the project appears to have deteriorated to a point where it no longer provides the benefits needed to be considered as acceptable replacement habitat. A common reason for a significant loss of habitat value is due to the encroachment from development. When an established wildlife project has houses surrounding it that are closer than 300 feet, it no longer meets the requirements of replacement habitat and is removed from the cumulative project total.

There has been no specific decision on how long this follow-up habitat assessment will be conducted in the Grand Valley Unit, but it is assumed the follow-up habitat assessments will end when the concurrent habitat goals have been met, since the acreage treatment goals and salinity control goals have already been met and the on-farm irrigation treatment work is considered to be complete.

Table 24 – Grand Valley Unit Completed Project Wildlife Habitat Replacement Table

Habitat Replacement	Acres
Salinity Program Irrigated Acres Treated to Date	42,860
Habitat Replacement Goal (GV @ 1,200 ac + WW&DB @ 6.0 ac) ^{1/}	1,206
Habitat Replacement Acres Applied and Maintained through FY 2014 ^{2/}	778
Habitat Replacement Acres Applied During FY 2015	0
Total Habitat Replacement Acres Through FY 2015	778
Remaining Acres to Meet Concurrent Habitat Replacement Goal ^{3/}	428
Remaining Acres Needed to Meet Full Project Replacement Goal ^{4/}	428

Note the rose colored boxes are negative or a deficit and the green colored box indicates a surplus

1/ Includes 6 acres for the Whitewater(WW) and DeBeque(DB) areas, added to the Grand Valley Unit based on a site visit to each individual WW and DB project to calculate the expected habitat losses.

2/ The habitat acres applied and maintained include 355.0 acres of habitat improvements provided by USBR to cover the NRCS on-farm irrigation improvements per interagency agreement, plus the 422.7 acres of replacement habitat currently reported by the NRCS as applied and maintained.

3/ Assume a full project implementation at 42,000 acres of irrigation treatment. Concurrent habitat replacement at full project implementation goal of 1,206 ac

4/ The full project replacement goal may increase due to additional acres in the Whitewater(WW) and DeBeque(DB) areas based on the calculated habitat losses for each project installed.

As displayed in Table 24, the Grand Valley Unit is currently **428 acres** below the concurrent replacement needed. However significant efforts are being made working with other agencies, wildlife groups, and willing landowners to accelerate the rate of replacement to meet concurrent and future goals. There are currently **590 acres** of habitat enhancement under contract, including **490 acres** of improvement on Colorado Parks and Wildlife lands. The CPW project is currently underway with **\$129K** expended on habitat improvements to date. If all of these funded projects are installed as planned, the Grand Valley Unit will exceed the full wildlife habitat replacement requirements for the Colorado River Salinity Control Program, and should have excess acres sufficient to cover any program habitat losses for the foreseeable future.

Table 25 – Grand Valley Unit Completed Project Wildlife Habitat Planned and Applied with Funded Contracts

Program	Fiscal Year	Wetland Habitat Planned (ac)	Cumulative Wetland Habitat Planned (ac)	Wetland Habitat Applied (ac)	Cumulative Wetland Habitat Applied (ac)	Cumulative Planned Wetland Applied (%)	Upland Habitat Planned (ac)	Cumulative Upland Habitat Planned (ac)	Upland Habitat Applied (ac)	Cumulative Upland Habitat Applied (ac)	Cumulative Planned Upland Applied (%)
CRSCP	1987-1995	111.4	111.4	27.5	27.5	27%	892.2	892.2	151.8	151.8	17%
IEQIP/EQIP	1996 - 2006	56.7	56.7	17.6	17.6	33%	253.1	253.1	95.1	95.1	36%
EQIP	2007-2014	0.0	0.0	0.0	0.0	^{1/}	131.6	140.3	41.43	41.4	^{1/}
	2015	0.0	0.0	0.0	0.0	^{1/}	8.1	148.4	0.0	41.4	^{1/}
BSP/BSPP	1997-2014	36.3	36.3	14.7	14.7	43%	253.8	253.8	74.5	74.5	28%
BSP/BSPP	2015	0.0	36.3	0.0	14.7	^{1/}	0.0	253.8	0.0	74.5	^{1/}
	Total		204.4		59.8	32%		1,547.5		362.9	22%
Total Habitat Replacement Acres Applied and Maintained ^{2/}											422.7
Note: Each of the program yearly incremental cumulatives are the bold numbers in the darker green boxes.											

^{1/} The majority of the FY 2007 through FY 2015 contracts are active and practices are still being applied. The planned versus applied percentage is not applicable until the majority of the contracts have been completed.

^{2/} The Total Habitat Acres Applied in this box are from the NRCS programs. The total habitat acres applied to meet Salinity Program replacement obligations include the 355 acres provided through inter-agency agreement with the USDI-BOR, for a total salinity wildlife habitat replacement of 778 acres.

Table 26 – Grand Valley Unit Completed Project Salinity Wildlife Funding NRCS On-Farm Programs

CRSCP/EQIP/ I-EQIP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 1979 to FY 2014	\$36,827,023
Funds Obligated to Salinity FY 2015	\$308,291
Funds Obligated to Wildlife Projects FY 1979 to FY 2014	\$2,735,280
Funds Obligated to Wildlife Projects FY 2015	\$396
Funds Spent on Wildlife Projects FY 1979 to FY 2014	\$855,056
Funds Spent on Wildlife Projects FY 2015	\$2,087
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 1979 to FY 2015	7.4%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 1979 to FY 2015	2.3%

Table 27 – Grand Valley Unit Completed Project Salinity Wildlife Funding BSP/BSPP On-Farm Programs

BSP/BSPP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 1997 to FY 2014	\$2,659,788
Funds Obligated to Salinity FY 2015	\$0
Funds Obligated to Wildlife Projects FY 1997 to FY 2014	\$638,395
Funds Obligated to Wildlife Projects FY 2015	\$0
Funds Spent on Wildlife Projects FY 1997 to FY 2014	\$178,040
Funds Spent on Wildlife Projects FY 2015	\$129,009
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 1997 to FY 2015	24.0%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 1997 to FY 2015	11.5%

Table 28 – Grand Valley Unit Completed Project Salinity Wildlife Funding All On-Farm Programs

All Salinity Wildlife Funding	Amount
Funds Obligated to Salinity FY 1979 to FY 2014	\$39,486,811
Funds Obligated to Salinity FY 2015	\$308,291
Funds Obligated to Wildlife Projects FY 1979 to FY 2014	\$3,373,675
Funds Obligated to Wildlife Projects FY 2015	\$396
Funds Spent on Wildlife Projects FY 1979 to FY 2014	\$1,033,096
Funds Spent on Wildlife Projects FY 2015	\$131,096
Percent of Total Salinity Funds Obligated to Wildlife Projects FY 1979 to FY 2015	8.5%
Percent of Total Salinity Funds Spent on Wildlife Projects FY 1979 to FY 2015	2.9%

Grand Valley Unit Completed Project – Grand Junction Field Office - Wildlife Habitat Funding Discussion

The dollars spent at any given time will always be lower than the obligated funds due to unexpended funds in active contracts pending practice installation, delays between practice installation and practice certification with payment, and using estimated costs that obligate more funds than are typically needed to install all of the habitat improvements. The differences displayed in the tables above are likely due to the estimated versus actual costs and the active contracts that have not currently applied all of the practices scheduled to earn incentive payments.

During the early implementation years of the program many operators reluctantly agreed to make small and typically expensive habitat improvements as a condition to getting the funding for their irrigation improvements. Many applicants fulfilled this agreement, but a number eventually canceled or never installed the scheduled habitat improvements, so the money was obligated, but never spent. This trend was part of what necessitated the changes to wildlife only contracts, focusing on larger habitat projects in locations better suited to habitat development and enhancement, and utilization of parallel salinity funds to develop wildlife habitat replacement agreements under salinity control. The rates of obligated versus expended funds for wildlife have improved significantly with this approach.

Funding of wildlife projects from all salinity programs is outlined in Table 28. To date, \$1,033,096 has been spent on wildlife projects in the Grand Valley Unit, which is 2.7% of the total obligated funds for all salinity programs. A total of \$804,419 of BSP funding was obligated in FY 2015. One small EQIP wildlife contract was obligated in FY 2015. The NRCS under the BSP/BSPP program planned 290 acres of wildlife habitat since 2001 (Table 25), and 88 acres have been applied. In FY 2012 NRCS completed planning on 490 acres to utilize additional BSP/BSPP and the funding agreement has been finalized. Through FY 2015 a total of \$638,395 BSP/BSPP funds have been obligated to wildlife projects, with \$178,040 spent to date on wildlife projects (Table 27), which is 6.7% of the total BSP/BSPP salinity funding.

Grand Valley Unit Completed Project – Grand Junction Field Office - Wildlife Habitat Replacement Summary and Conclusions

Replacement efforts in the Grand Valley Unit to offset wildlife habitat values lost is dynamic as urban development impacts areas that once were managed for wildlife under the salinity control program. Each year wildlife acres are applied throughout the Grand Valley Unit, and additional acres are also removed as identified by periodic field checks by an NRCS biologist. Efforts must be placed on increasing the interest of landowners to establish and maintain wildlife habitat. Direct contact with landowners who own large parcels or land along natural washes and drainages will be beneficial.

Cancellation rates of EQIP wildlife contracts have decreased with the advent of separate contracts for wildlife only projects, and with landowners specifically interested in developing and/or improving wildlife habitat. Retention rates should also improve as established practice lifespan for practices associated with wildlife habitat have increased from 10 years under the GVSP program, to either a 20 or and 25 year practice lifespan under the current EQIP program.

The retention of applied wildlife habitat acres may also be increased by working with lands that have conservation easements in place. The cooperative efforts involve working closely with land trust organizations to identify possible landowners with conservation easements that are interested in providing wildlife habitat. A combination of salinity funds to develop wildlife habitat with the partner funds to acquire the easement, benefits both interests. Working with Mesa County and the cities of Grand Junction, Fruita, and Palisade to establish projects located in development buffer zones may increase opportunities for wildlife projects with willing landowners. Working with the Colorado Parks and Wildlife has provided opportunities on medium to large sized parcels along the Colorado River corridor in the Grand Valley.

In FY 2007 the NRCS Biologist conducted a comprehensive review on all of the previously applied salinity wildlife habitat replacement projects to account for replacement project that were still in place and met salinity habitat replacement goals as applied and maintained. The Biologist field checked all acres that had been reported as wildlife habitat replacement. The inventory resulted in a reduction of acres considered suitable salinity wildlife habitat replacement from **776 acres in FY 2006**, to **684 acres in FY 2007**.

Since the initial comprehensive review all habitat replacement projects are monitored at least once every three years to ensure they continue to meet the wildlife habitat replacement goals. Prior to FY 2013 all projects were monitored the same year. Beginning in FY 2013, 1/3 of the total projects were monitored each year in order to make the additional monitoring work load more manageable. Each time monitoring occurs projects that are found to no longer meet the objectives of the program are removed from reported acreage. Urban development, changes in management, and changes in land ownership are the major reasons that some acres no longer met wildlife habitat replacement criteria and were removed from the accounting system. It is assumed that once the project habitat replacement goals have been met, the entire project will be considered complete, since the acreage treatment and salinity reduction goals have already been met.

As previously stated, the combined wildlife habitat replacement goal for the Grand Valley Unit is **1,206 acres**. To date **42,860 acres** have been treated with irrigation improvement practices, or **100%** of the total adjusted acreage treatment goal and **109%** of the salinity reduction goal has been met. To be concurrent with project application, **1,206 acres** of wildlife habitat replacement should currently be on the ground and functioning. To date **778 acres** of wildlife habitat replacement are maintained and provide suitable replacement habitat. The project is currently at **64%** of the concurrent wildlife habitat replacement goals.

The addition of **490 acres** of wildlife habitat replacement planned and funded on Colorado Parks and Wildlife land with a BSP contract. The CPW project combined with the other wildlife habitat replacement projects currently under contract, provide enough additional acres that when all replacement wildlife habitat is applied as planned, the Grand Valley Unit will exceed the **1,206 acre** replacement goal. When all of the habitat improvement projects currently under contract are implemented, the total acres will provide **approximately 100 acres** of wildlife habitat replacement over the minimum requirement for the Grand Valley Unit.

The Colorado Parks and Wildlife Project is currently underway with **\$129K** of habitat replacement work completed to date.

Pending the results with the implementation of the existing wildlife habitat replacement contracts in the Grand Valley Unit, the NRCS may need to continue to place high priority on wildlife habitat replacement to be concurrent with replacing the habitat acres lost during the life of the program.

APPENDIX 1.

Summary of legislation providing authority to USDA to conduct Colorado River Basin Salinity Control activities

First Legislation

Public Law (PL) 93-320 Colorado River Basin Salinity Control Act, June 6, 1974 (SCA)
Title II-Measures Upstream from Imperial Dam Section 201.

“(c) In conformity with section 201(a) of this title and the authority of the Environmental Protection Agency under Federal Laws, the Secretary (of Interior), the Administrator of the Environmental Protection Agency, and the Secretary of Agriculture are directed to cooperate and coordinate their activities effectively to carry out the objective of this title.”

“The Secretary of the Interior is directed in Section 202 to construct four salinity control units: (1) The Paradox Valley unit, Montrose County, Colorado, (2) The Grand Valley Unit, Colorado, (3) the Crystal Geyser Unit, Utah and (4) the Las Vegas Wash Unit, Nevada.”

First USDA Project

The Grand Valley unit would include all measures to reduce seepage from canals and laterals as well as limiting excess water application to irrigated lands

“The Secretary (of Interior) will enter into agreement with the Secretary of Agriculture to develop a unified control plan for the Grand Valley unit. The Secretary of Agriculture is directed to cooperate in the planning and construction of on-farm systems measures under programs available to that Department.”

This language provided the first authority for USDA to conduct Colorado River Basin salinity control activities. USDA used its authority provided in the Food and Agriculture Act of 1977. Title XV. Section 1501 – the Agricultural Conservation Program (ACP).

Projects Planned

The (SCA) Section 203, also authorized and directed the Secretary (of Interior)

“to expedite planning reports for (a) Irrigation source control: Lower Gunnison, Uinta Basin, Colorado River Indian Reservation, Palo Verde Irrigation District (b) Point source control: LaVerkin Springs, Littlefield Springs, Glenwood-Dotsero Springs and (c) Diffuse source control: Price River, San Rafael River, Dirty Devil River, McElmo Creek, Big Sandy River. USDA cooperated with USDI in the preparation of all of these reports.”

CRSC Program Created

PL98-569 Colorado River Basin Salinity Control Act, Amendment. October 30, 1984, provided that (c)(1)

“The Secretary of Agriculture may establish a voluntary cooperative salinity control program with landowners to improve on-farm water management and reduce watershed erosion on non-Federal lands and on lands under the control of the Department of Agriculture for the purpose of assisting in meeting the objective of this title. (2) In carrying out such program, the Secretary of Agriculture shall-

- (A) *identify salt-source areas and determine the salt load resulting from irrigation and watershed management practices;*
- (B) *develop, in consultation with the public and affected governmental interests, plans for implementing measures that will reduce the salt load of the Colorado River by improving on-farm irrigation water management including improvement of related laterals and by improving watershed erosion management practices, such measures to include voluntary replacement of incidental fish and wildlife values foregone;*
- (C) *provide technical and cost-sharing assistance for the voluntary implementation of plans through contracts and agreements with individuals or groups of owners and operators of farms, ranches, and other lands as well as with local governmental and nongovernmental entities such as irrigation districts and canal companies, except that a portion of the costs of implementing such plans shall be shared by the participants on the basis of benefits received and other appropriate factors, as determined by the Secretary of Agriculture, and except that such contracts and agreements shall provide for continuing operation and maintenance of measures installed under this subsection, including measures to replace incidental fish and wildlife values foregone, with additional cost-sharing assistance;*
- (D) *provide continuing technical assistance for irrigation water management as well as monitoring and evaluation of changes in salt contributions to the Colorado river to determine program effectiveness;*
- (E) *carry out related research, demonstration , and education activities; and*
- (F) *in entering into contracts or agreements pursuant to section 202©(2)©, require a minimum of 30 per centum cost-sharing contribution from individuals or groups of owners and operators of farms, ranches, and other lands as well as from local governmental and nongovernmental entities such as irrigation districts and canal companies, unless the Secretary finds in his discretion that such cost-sharing”*

New Projects Approved

This SCA amendment led to the establishment of USDA’s Colorado River Salinity Control Program (CRSCP). Under this program, six project areas were planned and authorized: Grand Valley, Lower Gunnison, McElmo Creek, Colorado; Uinta Basin, Price-San Rafael Rivers, Utah; and Big Sandy River, Wyoming. Each project area is described by its respective environmental impact statement (EIS) with the exception of Lower Gunnison and Uinta Basin that are included in a single, combined EIS.

EQIP Created

PL104-127 the Federal Agricultural Improvement and Reform Act of 1996, April 4, 1996, Section 336(c) amended the Salinity Control Act and established a new authority for USDA, i.e. the Environmental Quality Incentives Program.

“(c) COLORADO RIVER BASIN SALINITY CONTROL PROGRAM- (I) IN GENERAL- Section 202 of the Colorado River Basin Salinity Control Act (43 U.S.C. 1592) is amended by striking subsection (c) and inserting the following: (c) SALINITY CONTROL MEASURES – The Secretary of Agriculture shall carry out salinity control measures (including watershed enhancement and cost-share measures with livestock and crop producers) in the Colorado River Basin as part of the environmental quality incentives program established under chapter 4 of subtitle D of title XII of the Food Security Act of 1985.”

Additionally, Section 334 of the 1996 Farm Bill amended the Food Security Act of 1985 by adding a new Chapter 4 to Subtitle D of Title XII of the 1985 Act (i.e. EQIP). In particular, as amended, Section 1240 of the 1985 Act provided as follows:

“Sec. 1240. PURPOSES.

The purposes of the environmental quality incentives program established by this chapter are to-

- (1) combine into a single program the functions of-*
 - (A) the agricultural conservation program authorized by sections 7 and 8 of the Soil Conservation and Domestic Allotment Act (as in effect before the amendments made by section 336(a)(1) of the Federal Agriculture Improvement and Reform act of 1996);*
 - (B) the Great Plains conservation program established under section 16(b) of the Soil Conservation and Domestic Allotment Act (as in effect before the amendments made by section 336(b)(1) of the Federal Agriculture Improvement and Reform Act of 1996);*
 - (C) the water quality incentives program established under chapter 2 (as in effect before the amendment made by section 336(h) of the Federal Agriculture Improvement and Reform Act of 1996); and*
 - (D) the Colorado River Basin salinity control program established under section 202(c) of the Colorado River Basin Salinity Control Act (as in effect before the amendment made by section 336(c)(1) of the Federal Agricultural Improvement and Reform Act of 1996).”*

Interim EQIP Authorized

To provide for temporary administration and continue programs during the development of the EQIP rule making and implementation phase

“TEMPORARY ADMINISTRATION OF ENVIRONMENTAL QUALITY INCENTIVES PROGRAM.

a) *Interim Administration.*—

(1) *In general.*--During the period beginning on the date of enactment of this section and ending on the termination date provided under paragraph (2), to ensure that technical assistance, cost-share payments, and incentive payments continue to be administered in an orderly manner until such time as assistance can be provided through final regulations issued to implement the environmental quality incentives program established under this chapter, the Secretary shall continue to--

(A) *provide technical assistance, cost-share payments, and incentive payments under the terms and conditions of the agricultural conservation program, the Great Plains conservation program, the water quality incentives program, and the Colorado River Basin salinity control program, to the extent the terms and conditions of the program are consistent with the environmental quality incentives program; and*

(B) *use for those purposes--*

(i) any funds remaining available for the agricultural conservation program, the Great Plains conservation program, the water quality incentives program, and the Colorado River Basin salinity control program; and

(ii) as the Secretary determines to be necessary, any funds authorized to be used to carry out the environmental quality incentives program.

(2) *Termination of authority.*--The authority of the Secretary to carry out paragraph (1) shall terminate on the date that is 180 days after the date of enactment of this section.

(b) *Permanent Administration.*--Effective beginning on the termination date provided under subsection (a)(2), the Secretary shall provide technical assistance, cost-share payments, and incentive payments for structural practices and land management practices related to crop and livestock production in accordance with final regulations issued to carry out the environmental quality incentives program.”

CRSC Language Removed

“Section 2301 of the Farm Security and Rural Investment Act of 2002 (the 2002 Farm Bill) amended Section 1240 of the Food Security Act of 1985 and the reference to the Colorado River Basin salinity control program was removed, presumably since its purposes had already been incorporated into EQIP and thus the reference to the former program was no longer needed.”

(Communication from Martha Joseph, Special Assistant to the Deputy Chief for Programs, NRCS, Washington , D.C. 16 March 2016.)

EQIP Reauthorized

In the Food Security and Rural Investment Act of 2002 (2002 Farm Bill), the Food, Conservation and Energy Act of 2008 (2008 Farm Bill) and the Agricultural Act of 2014 (2014 Farm Bill) that is in effect through fiscal year 2018.

Basin States Program

The 2008 Farm Bill amended the Colorado River Basin Salinity Control Act to create the “Basin States Program” as follows:

Subsection 202(a) (7) BASIN STATES PROGRAM-

- (A) *IN GENERAL – A Basin States Program that the Secretary, acting through the Bureau of Reclamation, shall implement to carry out salinity control activities in the Colorado River Basin using funds made available under section 205(f).*
- (B) *ASSISTANCE – The Secretary, in consultation with the Colorado River Basin Salinity Control Advisory Council, shall carry out this paragraph using funds described in subparagraph (A) directly or by providing grants, grant commitments, or advance funds to Federal or non-Federal entities under such terms and conditions as the Secretary may require.*
- (C) *ACTIVITIES – Funds described in subparagraph (A) shall be used to carry out, as determined by the Secretary-*
 - (i) *Cost effective measures and associated works to reduce salinity from saline springs, leaking wells, irrigation sources, industrial sources, erosion of public and private land, or other sources;*
 - (ii) *Operation and maintenance of salinity control measures constructed under the Colorado River Basin salinity control program; and*
 - (iii) *Studies, planning and administration of salinity control activities.*

The Basin States Program authority provides the U.S. Bureau of Reclamation a mechanism to cooperate with the USDA-NRCS to identify, plan, fund and implement salinity control projects that might otherwise not be assisted through the EQIP.