Monitoring and Evaluation Report
Colorado Salinity Control Valley Units

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

Fiscal Year 2013

USDA-NRCS
Delta, Colorado
Montrose, Colorado
Cortez, Colorado
Glenwood Springs, Colorado
Grand Junction, Colorado
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EXECUTIVE SUMMARY
LOWER GUNNISON UNIT
FY 2013

Lower Gunnison Unit Hydro-Salinity -

- The project plan is to treat approximately **115,000 acres** [/1] with improved irrigation systems.
- To date **63,675 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 2013, salt loading has been reduced an additional **2,106 tons/year** as a result of installed salinity reduction practices.
- The cumulative salt load reduction is **113,860 tons/year**, or **69 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 63,675 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 2013 contracts (one year) is **$129.01 /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 2013 = 0.0623
TA = technical assistance cost: (FA x 0.67)

Lower Gunnison Unit Wildlife Habitat Replacement -

- The habitat replacement goal is at 2% of the current irrigation improvement acres, or 2% of 63,675 acres irrigation improvement acres equals **1,274 acres** of habitat replacement developed or significantly enhanced.
- In Fiscal Year 2013, **7.8 acres** of wetland habitat and **175.4 acres** of upland habitat have been reported as applied.
- To date, a cumulative **1,191 acres** of habitat replacement or **93%** 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 accelerate the implementation of wildlife habitat enhancement projects.

Lower Gunnison Unit Key Considerations and Conclusions –

- The 2014 salinity signup is currently similar to the 2013 signup. Continued economic recovery and outreach activities have contributed to the steady interest in program participation.
- The National Water Quality Initiative provided additional focus on overall water quality improvement in Delta County, in the hydrologic unit that encompasses Fruitgrowers Reservoir. While participation has been modest to date, the primary practices addressed in water quality contracts were irrigation system improvements that support the Colorado salinity control efforts.
- The Colorado River Salinity Control Forum through the US Bureau of Reclamation (USBR) and the Lower Gunnison Salinity Study Team authorized funding a study to identify barriers to program participation and opportunities to promote accelerated salinity control in the Lower Gunnison Unit. The USBR contracted with the URS Corporation to conduct the study. The results of the study are currently in draft form and will be released at a future date.
- The new agreement between USBR and the State of Colorado for the Basin States Program generated additional interest and resulted in the preapproval of several contracts, with additional applications still to be serviced.
- 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 is growing 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 address better soil health.
- 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.
- The planned and contracted acres of wildlife habitat in FY 2013 showed a significant increase over the previous years, at 16.1 acres of wetland improvements contracted, and 194.3 acres of upland habitat improvements contracted. This increase in habitat acres planned will help lead to a continued increase in habitat acres applied over the next few years
- In 2007, when the NRCS and USFWS agreed to the 2 acre per 100 acres habitat replacement goal, the Lower Gunnison Unit was at 60 percent of the concurrent acreage replacement goal. Over the past 5 years additional emphasis has been placed on increasing the number and size of habitat replacement projects. The wildlife habitat replacement totals in 2009 through 2013 in the Lower Gunnison Unit increased respectively from 60% to 93% of the concurrent goaled acres. This trend is expected to continue into the future. Although it was previously projected the Lower Gunnison Unit would be fully concurrent by FY 2019, the gains in wildlife habitat applied and planned in FY 2013 indicate this goal may be achieved earlier than expected.

Lower Gunnison Unit Key Considerations and Conclusions (continued) –

- The total number of acres and contracts for the Delta and Montrose field offices for Irrigation Water Management (IWM) Conservation Practice certifications decreased from 113 contracts on 5,103 acres certified in 2011, to 82 contracts on 2,931 acres certified in 2013 for two main reasons:
    a. EQIP reduced the IWM follow-up requirement from 3 years of IWM certification to 2 years of IWM certification[1/] on contracts starting in 2011.
    b. Due to the temporary suspension of new Basin Sates contracts in 2010 and 2011 there was a net reduction of Basin contract IWM certifications from 6 contracts in 2011 to 0 in 2013. As the new FY 2012 and FY 2013 Basin States contracts are installed and management practices are certified this number will increase.

    [1/] Note also, the change in EQIP follow-up requirements from 2 to 3 years does not result in a net loss in acres meeting IWM standards, it only reduced the administrative burden of an additional year of practice certification. IWM technical assistance is still available to any landowner needing additional year's assistance.

- **For FY 2013, 7.8 acres of wetland habitat and 175.4 acres of upland habitat were applied, and the cumulative habitat replacement total is at 1,191 acres of wildlife habitat replacement installed and maintained. The concurrent status is at 93% of the goaled acres based on 2 acres of habitat replacement for each 100 acres of irrigation system improvement in place, and this increase represents significant success in meeting the concurrent habitat replacement goal.**
- **In addition to the significant improvement in meeting the concurrent replacement status, the planned replacement acres for FY 2013 was up significantly at 210.4 acres of wildlife habitat improvement practices planned. The increase in planned acres will result in a large amount of habitat acres being installed over the next few years.**

EXECUTIVE SUMMARY
MCELMO CREEK UNIT
FY 2013

McELmo Creek Unit Hydro-Salinity -

- The project plan was to treat approximately **21,550 acres** with improved irrigation systems.
- To date **14,873 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 2013, salt loading has been reduced an additional **466 tons/year** as a result of installed salinity reduction practices.
- The cumulative salt load reduction is **27,720 tons/year,** or **57 percent** of the project goal.

[/1] Note: The 14,873 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 2013 contracts (one year) is **$82.32 /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 2013 = 0.0623
TA = technical assistance cost: (FA x 0.67)

McELmo Creek Unit Wildlife Habitat Replacement -

- The habitat replacement goal is at 2% of the current irrigation improvement acres, or 2% of 14,873 acres irrigation improvement acres equals **297 acres** of habitat replacement developed or significantly enhanced.
- In Fiscal Year 2013, no new wetland habitat and no new acres of upland habitat were reported as applied.
- To date, a cumulative **451 acres** [2/] or **155%** [3/] of the current wildlife habitat replacement goal has been established.
- Additional 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.

[2/] Within the McElmo Creek project area there are 451 acres of wetland habitat reported through FY2013 and 809 acres of upland habitat reported. It is initially assumed all of the wetland acres should provide suitable replacement habitat, however it is unknown whether the upland habitat will meet suitable replacement requirements, so the upland acres are not included in the initial total. A preliminary field inventory and assessment was started during FY 2013. However, additional assessment will be needed to determine the actual habitat replacement acres still in place and suitable to meet salinity replacement habitat requirements. Additional work is currently being done to update the habitat inventory so the final field assessments can be conducted. The final inventory is scheduled to be completed during the spring and summer of FY 2014, and final adjustments to the habitat replacement numbers will be updated in the FY 2014 reports.

[3/] Assume a full project implementation at 21,550 acres of irrigation treatment at 2 acres of habitat replacement per 100 acres of irrigation improvements, for a total 431 acres of habitat replacement needed, or the project currently meets 105% of the full project habitat replacement needs.

McElmo Creek Unit Key Considerations and Conclusions –

- Based on the habitat acres applied, there may be sufficient replacement to account for all the acres needed for a full project implementation of 431 acres of habitat improvements implemented at 2 percent of 21,550 acres irrigation improvement applied, however the current habitat status assessment is needed to assure the goal is met.
- The ongoing wildlife habitat assessment should be completed in the first half of 2014. Initial results indicate some of the reported habitat improvements may have been lost and there will be a reduction in the amount of wildlife habitat improvements reported.
- The number of applications increased slightly for 2013 however, the average contract is smaller and obligated fewer program dollars per contract.
- Reduced planning staff due to retirements and the uncertainties with potential additional budget reductions, created delays and uncertainties with refilling positions that resulted in a backlog of planning and a reduction in the percentage of applications resulting in an obligated salinity contract.
- It has been noted that slow and steady 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 appears to be leading to a similar or slight increase in the number of contracts, but with smaller field sizes, fewer acres treated, and reduced dollars 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.
- 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 addition on-farm irrigation system improvements.

EXECUTIVE SUMMARY
MANCOS VALLEY UNIT
FY 2013

Mancos Valley Unit Hydro-Salinity -

- The project plan is to treat approximately **5,400 acres** with improved irrigation systems.
- To date **2,695 acres** have been treated with improved irrigation systems.
- The project plan is to reduce salt loading to the Colorado River system by **11,990 tons/year** of salt.
- In FY 2013, salt loading has been reduced an additional **45 tons/year** as a result of installed salinity reduction practices.
- The cumulative salt load reduction is **4,370 tons/year**, or **36 percent** of the project goal.

Mancos Valley Unit Cost Effectiveness -

- The planned cost per ton of salt saved with FY 2013 contracts (one year) is **$200.64 /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 2013 = 0.0623
TA = technical assistance cost: (FA x 0.67)

Mancos Valley Unit Wildlife Habitat Replacement -

- The habitat replacement goal is at 2% of the current irrigation improvement acres, or 2% of 2,695 acres irrigation improvement acres equals **54 acres** of habitat developed or significantly enhanced.
- In Fiscal Year 2013, no new acres of wetland habitat and no new acres of upland were reported as applied.
- To date, a cumulative **137 acres** [1/] or **258%** [2/] of the current wildlife habitat replacement goal has been established.
- 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.

[1/] Within the Mancos Valley project area there are 137 acres of wetland habitat reported through FY2013 and 582 acres of upland habitat reported. It is assumed all of the wetland acres will provide suitable replacement habitat, however it is unknown whether the upland habitat will meet suitable replacement requirements, so those acres are not included in the total. An ongoing inventory is being conducted to verify the wetland projects are still being applied and maintained, meet the habitat enhancement requirements, and to determine if any of the upland projects meet suitable habitat replacement requirements.

[2/] Assume a full project implementation at 5,400 acres of irrigation treatment at 2 acres of habitat replacement per 100 acres of irrigation improvements, for a total 108 acres of habitat replacement needed, or the project currently exceeds 100% of the full project habitat replacement needs.

Mancos Valley Unit Key Considerations and Conclusions –

- Based on the habitat acres applied, there may be sufficient replacement to account for almost all the acres needed for a full project implementation of 140 acres of habitat improvements implemented at 2 percent of 7,020 acres irrigation improvement applied, however the current habitat status assessment is needed to assure the goal is met.
- The ongoing wildlife habitat assessment should be completed sometime in the first half of 2014.
- The Weber Ditch submitted a project proposal for US Bureau of Reclamation funds to pipe their delivery ditch. If approved, it is assumed piping the irrigation delivery system will encourage producers to participate in the NRCS or BSP on-farm program, and the delivery of piped irrigation water will likely encourage more irrigators to adopt the higher efficiency sprinkler or micro-spray system.
- 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 2013

Silt Unit Hydro-Salinity -

- The project plan is to treat approximately **2,800 acres** with improved irrigation systems.
- To date **1,510 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 2013, salt loading has been reduced an additional **18 tons/year** as a result of installed salinity reduction practices.
- The cumulative salt load reduction is **2,157 tons/year**, or **54 percent** of the project goal.

Silt Unit Cost Effectiveness -

- The planned cost per ton of salt saved with FY 2013 contracts (one year) is **$187.15 /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 2013 = 0.0623
TA = technical assistance cost: (FA x 0.67)

Silt Unit Wildlife Habitat Replacement -

- The original Silt replacement goal is **40 acres** of riparian/upland habitat and **10 acres** of wetland habitat developed or significantly enhanced.
- For Fiscal Year 2012 there were no new acres of habitat replacement applied
- To date, **19.4 acres** or **72%** of the concurrent 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 habitat replacement contract.

Silt Unit Key Considerations and Conclusions –

- Silt currently has 1,510 acres of applied irrigation system improvements in place out the 2,800 acres projected treatment in the original project plan and environmental assessment.
- In 2013 the number of participants in the Silt Salinity Unit decreased from FY 2012, however the contracted acres came up due to one large contract acreage. Even with the increase in acres in FY 2013, additional follow-up should be conducted to assess whether the 2,800 acre treatment goal is still needed and can be achieved.
- It is recommended the Field Office conduct some type of expedited inventory to update the number of acres still needing treatment under the Colorado River Salinity Control Program, so the project goals can be adjusted accordingly.
- It should be noted the Silt Unit is affected by an increasing number of small acreage landowners starting before the beginning of salinity project and continuing through 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 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 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 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 habitat replacement goals are being maintained.

EXECUTIVE SUMMARY
GRAND VALLEY UNIT - COMPLETED PROJECT
FY 2013

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 and **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 **42,581 acres** [1] or essentially **99 percent** of the project acreage goal 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 2013, salt loading has been reduced an additional **908 tons/year** as a result of installed salinity reduction practices.
- The cumulative salt load reduction is **142,007 tons/year**, or **108 percent** of the project treatment goal.

[1] Note: The 42,581 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 2013 contracts (one year) is **$119.67 /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 2013 = 0.0623
TA = technical assistance cost: (FA x 0.67)

Grand Valley Unit Completed Project Wildlife Habitat Replacement -

- The original Grand Valley 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 2013 there were **4 acres** of habitat replacement applied
- Most FY 2012 FY 2013 habitat projects were targeted for BSP funding and the delay of a signed funding agreement until late in FY 2012 prevented additional implementation, however a contract for an additional **490 acres** of habitat replacement was signed in November 2013.
- To date, **756 acres** or **63%** 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.

Grand Valley Unit Completed Project Key Considerations and Conclusions –

- A meeting was conducted with Bureau of Land Management, Bureau of Reclamation, US Fish and Wildlife Service, and NRCS to look for additional opportunities to develop or enhance wildlife habitat to meet the replacement goals.
- Planning was completed on 490 acres of Colorado Parks and Wildlife (CPW) property in FY 2013. Colorado State Conservation Board worked to complete an inner agency transfer/contract to obligate approximately $800,000 of BSP funds to the project. The contract to obligate the funds was completed and signed in November 2013.
- The addition of the **490 acres** of wildlife habitat replacement in the latest contract and the other habitat replacement projects currently under contract will exceed the **1,206 acre** replacement goal. If all of the habitat improvement projects are implemented as planned the total acres will provide a **surplus of approximately 100 acres** and the Grand Valley Unit will be concurrent.
- The Field Office inventory indicates there are about 2,900 acres of agricultural land with untreated or unknown irrigation system improvements.
- 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.
- The next follow-up sample inventory is due in FY 2014.
- **Activities conducted with the salinity partners in May of 2013 celebrated the conclusion of the on-farm salinity control portion of a highly successful NRCS Salinity Control Unit.**
    - **It is noted however, the conclusion of the on-farm salinity control portion of the Grand Valley unit does not negate or end the habitat replacement responsibilities for the project area. A strong emphasis and effort is still on-going to meet the full habitat replacement requirements. Future staff and management support is essential to meeting the habitat replacement goals necessary for the final conclusion of all critical project goals for the NRCS Grand Valley Salinity Control Unit.**
- 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 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 for irrigation improvements, salinity control, and other water quality resource concerns.
- A follow-up assessment will 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 duration of this assessment is unknown at this time.
- 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.

EXECUTIVE SUMMARY
COLORADO TIER 2 SALINITY IMPROVEMENT PROJECTS
FY 2013

Tier 2 Salinity

US Geological Survey, **SPA**tially-**R**eferenced **R**egression **O**n **W**atershed attributes (SPARROW) model provides salt loading by catchment and was used to determine uniform agricultural salt loading data for all basins within the Colorado River drainage. The SPARROW 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 **1,373** have been treated with improved irrigation systems as qualified Tier 2 Salinity Control Projects.
- In FY 2013, salt loading has been reduced an additional **417 tons/year** as a result of the installed salinity reduction practices.
- The cumulative salt load reduction for western Colorado Tier 2 Projects is **2,801 tons/year.**

Tier 2 Cost Effectiveness -

- The planned cost per ton of salt saved with FY 2013 contracts (one year) is **$93.22 /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 2013 = 0.0623
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 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 done to assess and record the anticipated project impacts, including impacts to water enhanced wildlife habitat.

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.

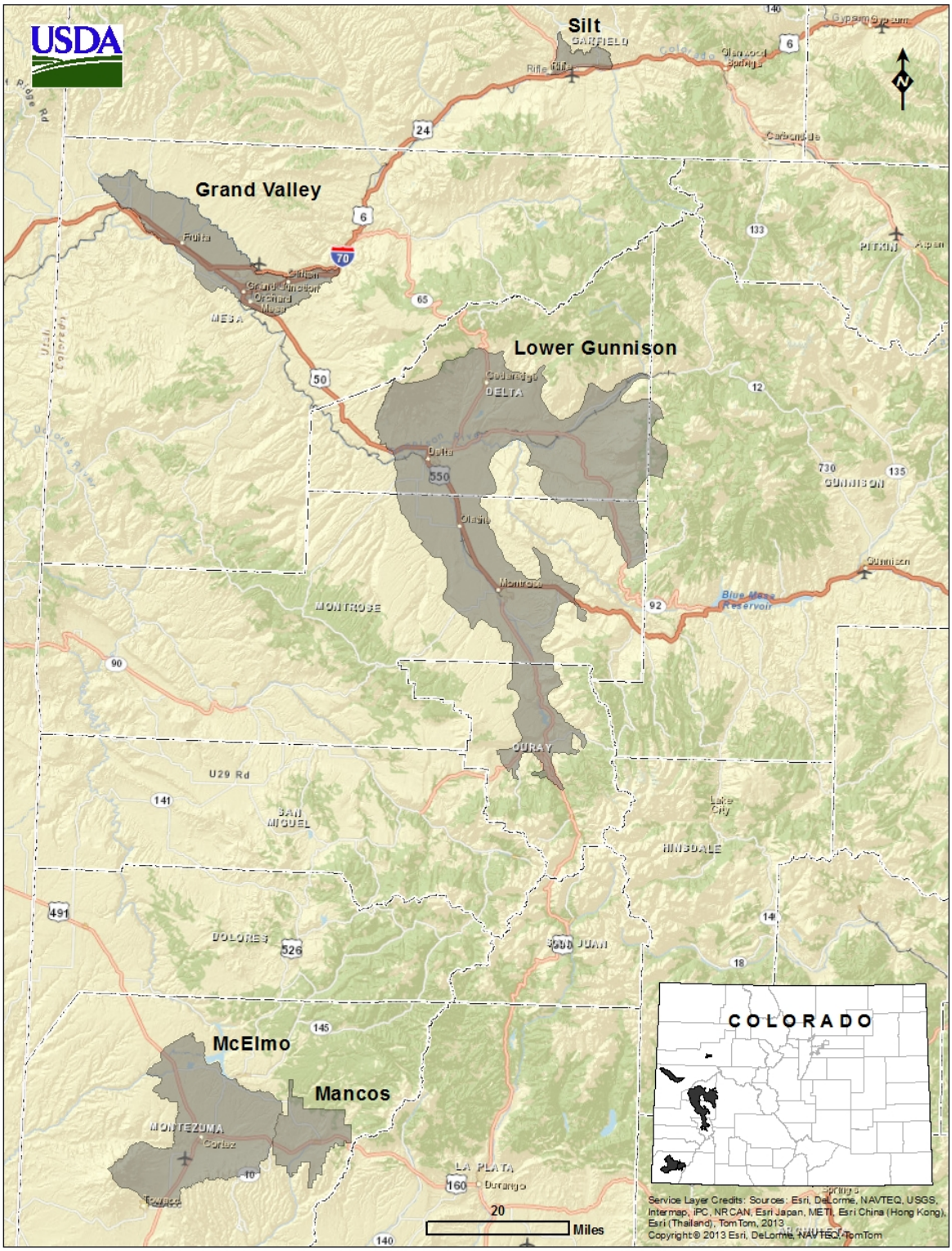
The Environmental Protection Agency (EPA) promulgated a regulation in December, 1974, which established a basin wide salinity control policy for the Colorado River Basin and also established a water quality standards procedure requiring basin states to adopt and submit for approval to the EPA, standards 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.

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%

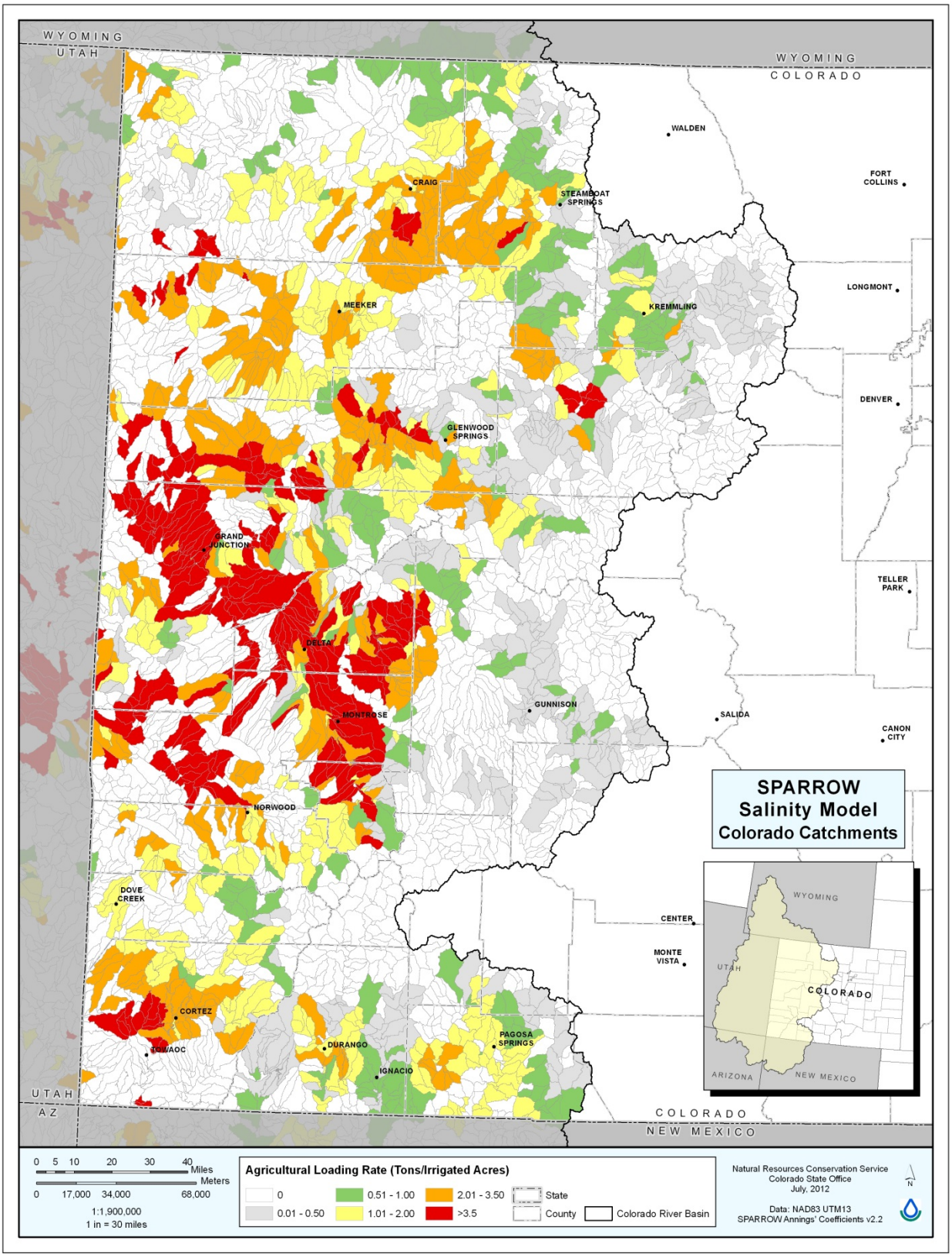
Note: Efficiencies listed are the NRCS planning standards for the various types of irrigation systems.

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

Tier 2 Salinity

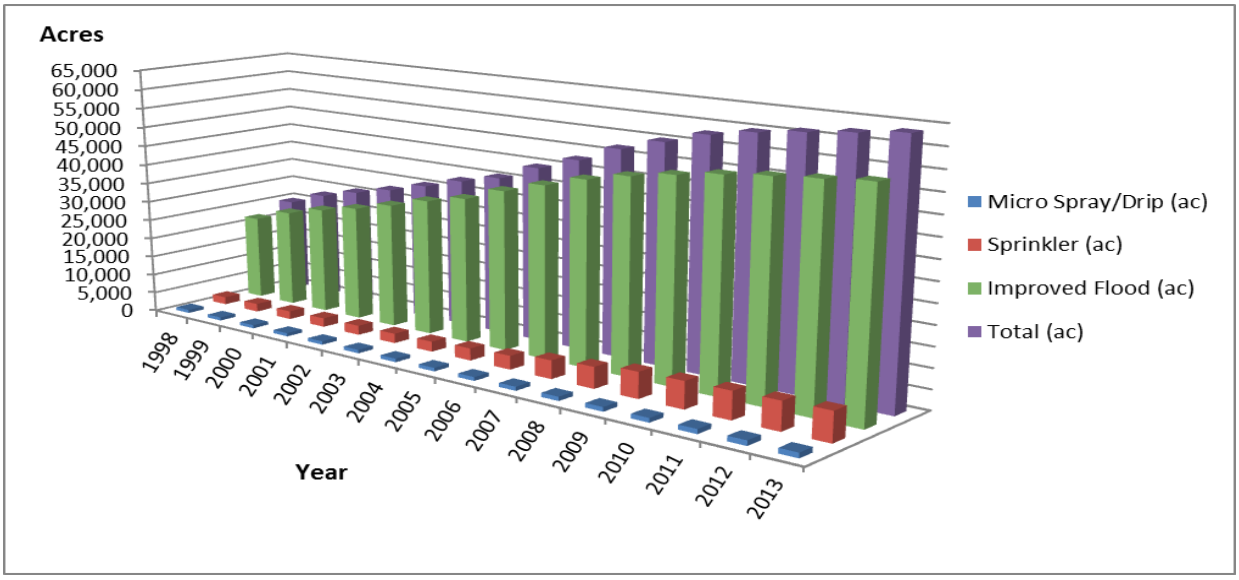
US Geological Survey, **SPA**tially-**R**eferenced **R**egression **O**n **W**atershed attributes (**SPARROW**) model provides salt loading by catchment and was used to determine uniform agricultural salt loading data for all basins within the Colorado River drainage. The SPARROW data has been accepted 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 2013	CUMULATIVE
Sprinkler	414	7,535
Improved Surface System	950	54,850
Micro-Spray/Drip System	5	1,290
TOTAL	**1,369**	**63,675**

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.

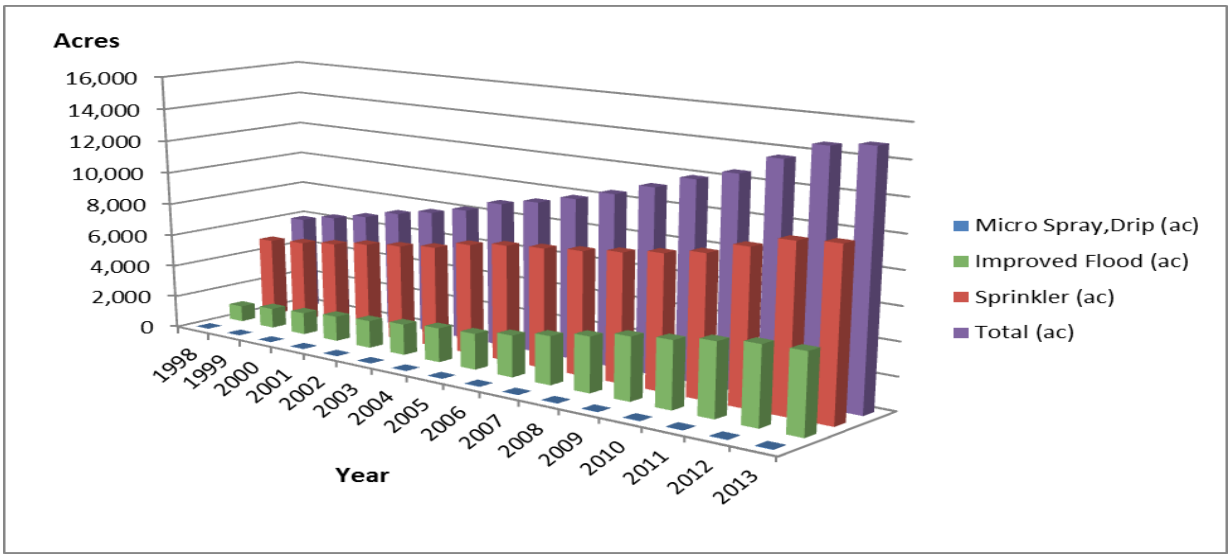
The Lower Gunnison Unit typically has some areas with larger and more uniform field sizes where sprinkler system are becoming more popular, however many areas have relatively small and sometimes irregular field sizes that make the installation of field sprinkler systems problematic. In addition, the 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 operator.

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)	FY2013	CUMULATIVE
Sprinkler	199	10,066
Improved Surface System	66	4,776
Micro-Spray/ Drip System	0	31
TOTAL	**265**	**14,873**

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

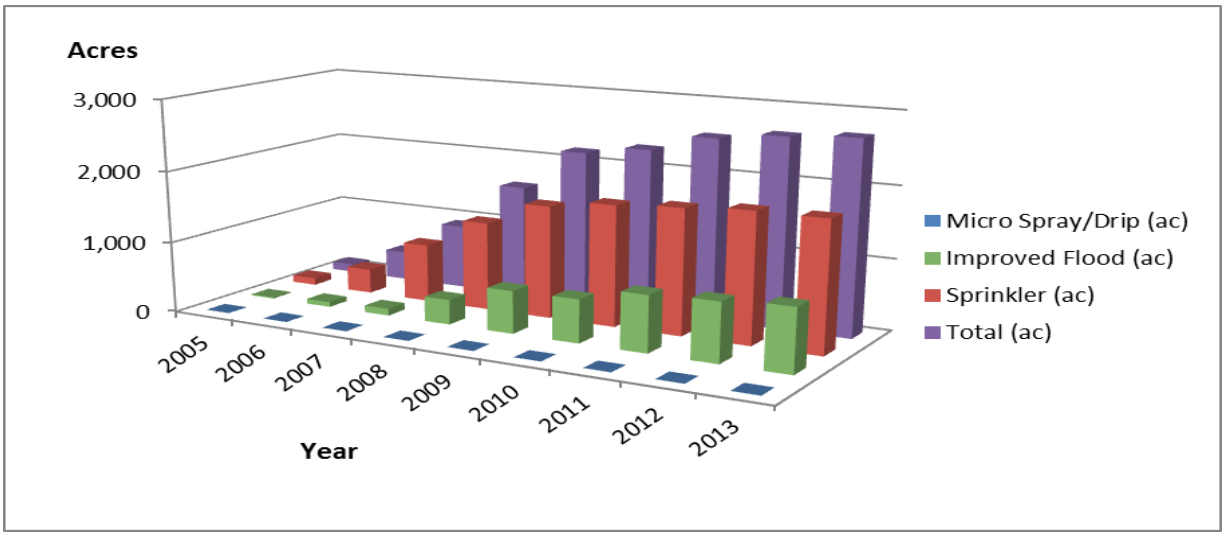
there has been intermittent installation and very limited acreage of micro-spray/drip irrigation systems installed through-out the life of the project.

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 operator. 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



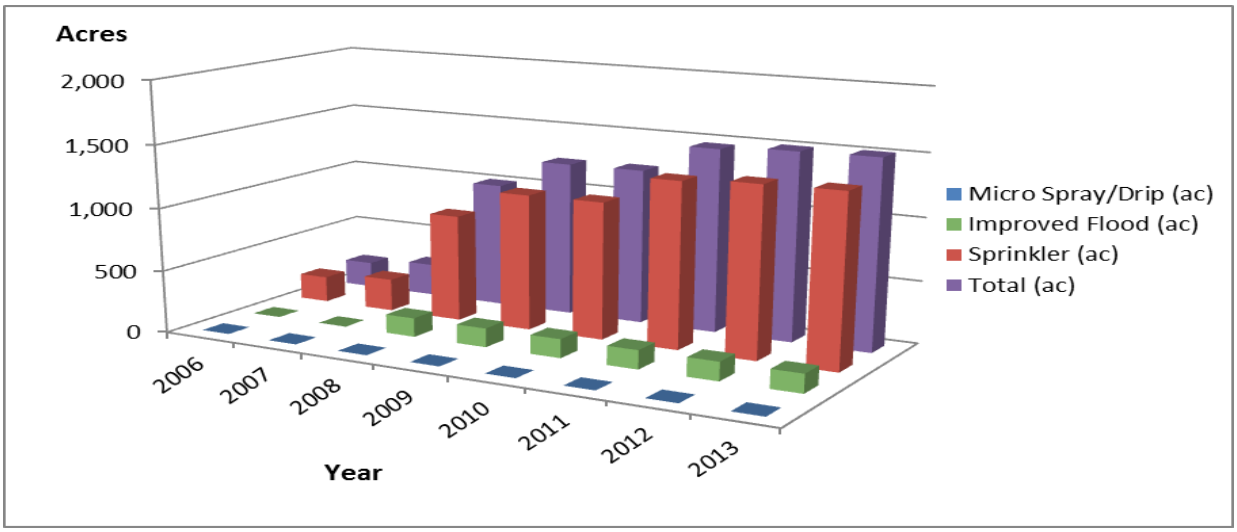
IRRIGATION SYSTEMS APPLIED (acres)	FY2013	CUMULATIVE
Sprinkler	2	1,814
Improved Surface System	56	881
Micro-Spray/Drip System	0	0
TOTAL	**58**	**2,695**

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 system 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 operator.

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



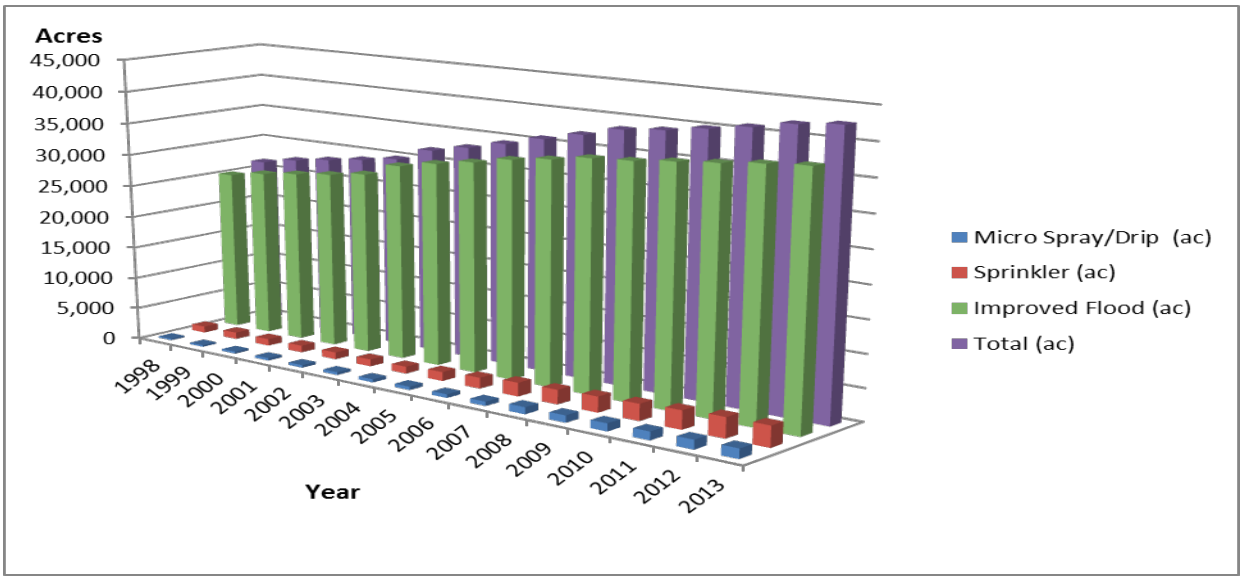
IRRIGATION SYSTEMS APPLIED (acres)	FY2013	CUMULATIVE
Sprinkler	9	1,360
Improved Surface System	0	150
Micro-Spray/ Drip System	0	0
TOTAL	**9**	**1,510**

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)	FY2013	CUMULATIVE
Sprinkler	54	3,198
Improved Surface System	450	37,867
Micro-Spray/Drip System	88	1,516
TOTAL	**592**	**42,581**

Note: The Grand Valley Unit was a designated salinity control project area from 1979 through 2012. The on-farm 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

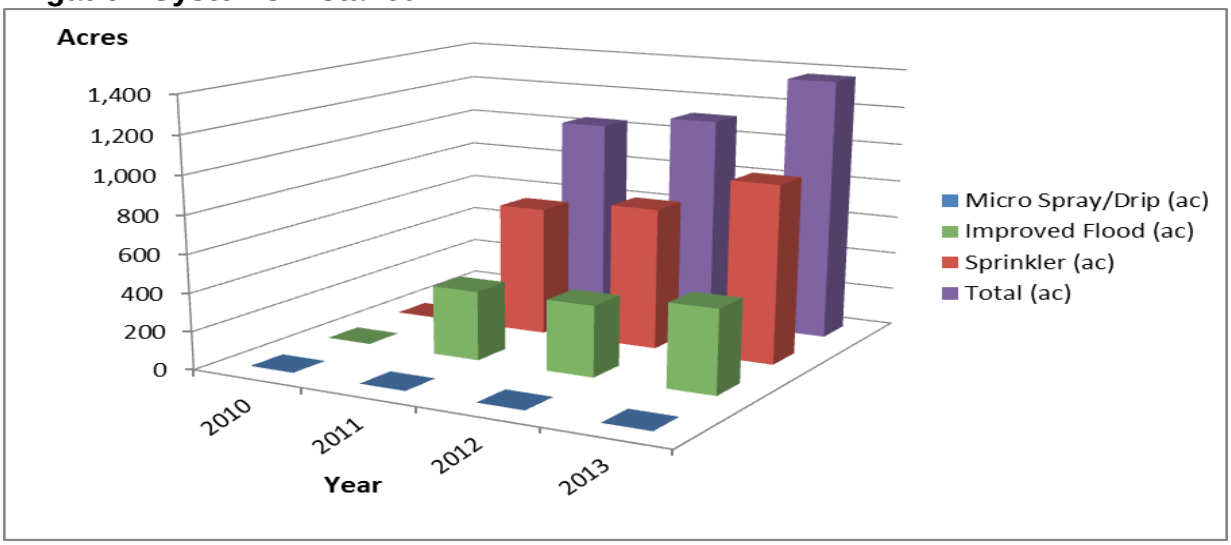
irrigators, although when the installation includes a regulating pond, pump installation, and the associated energy and maintenance costs, it complicates the decision and increases both the installation and operating costs for the operator.

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



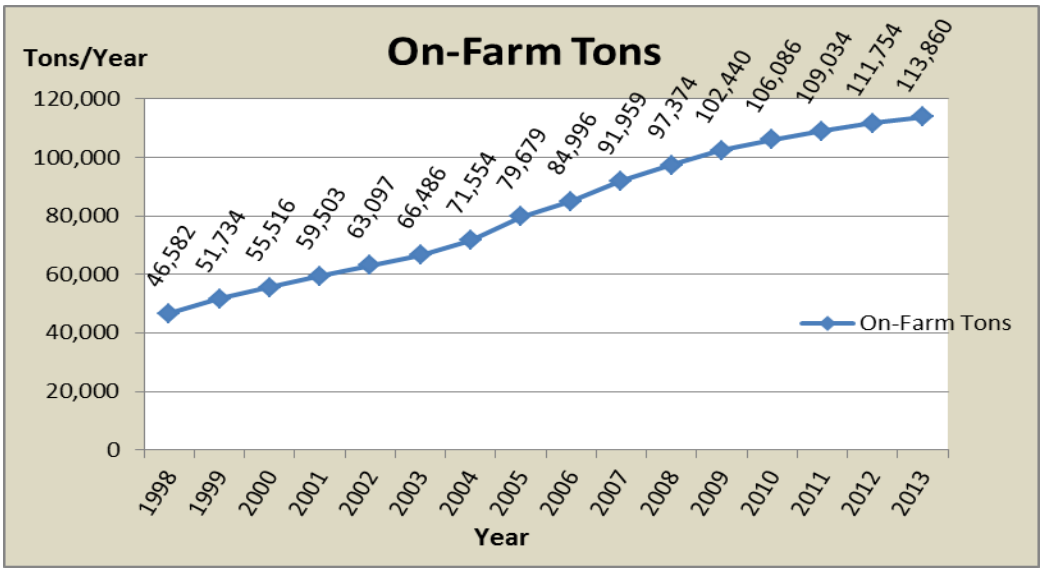
IRRIGATION SYSTEMS APPLIED (acres)	FY2013	CUMULATIVE
Sprinkler	191	935
Improved Surface System	66	438
Micro-Spray/Drip System	0	0
TOTAL	**257**	**1,373**

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.

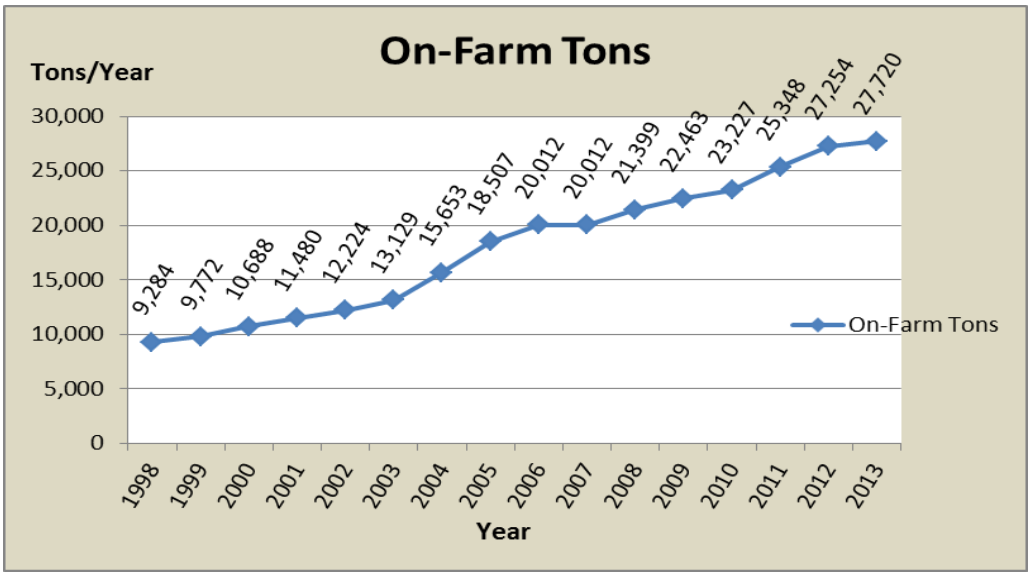
The Out-of-Project Area represents a diverse set of irrigated areas with a combination of small and larger land units. The trend seems to indicate that sprinklers are often the irrigation improvement being selected since they typically offer a more automated and easier to manage irrigation distribution system. Sprinkler systems also offer more built-in management with higher application efficiencies and a 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

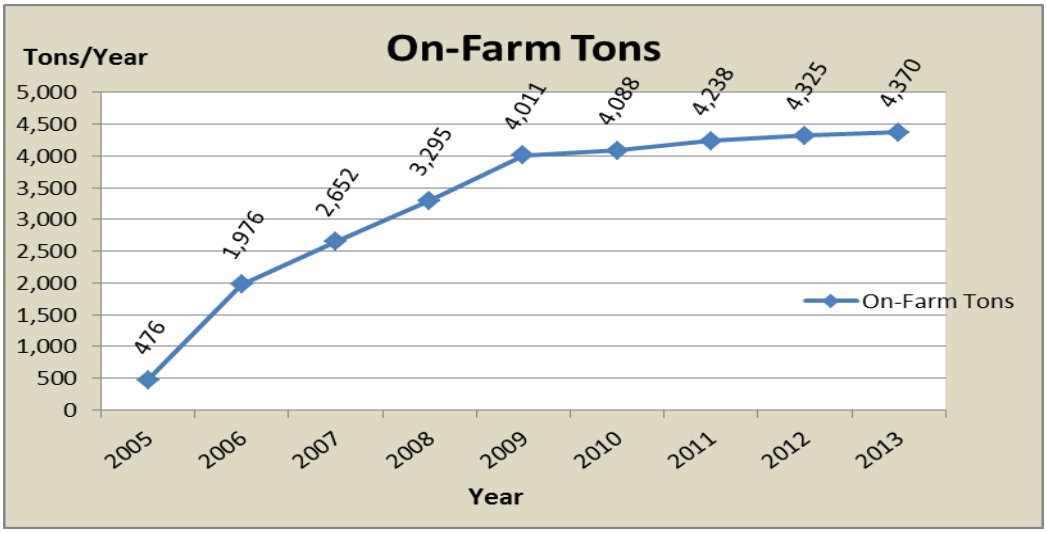
Graph 7– Lower Gunnison Unit Cumulative On-Farm Salinity Load Reduced



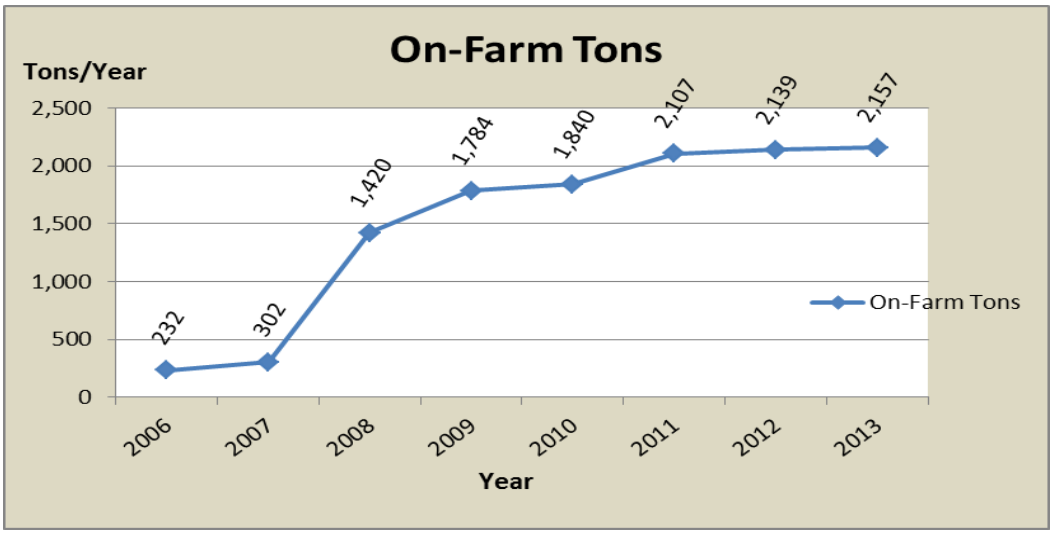
Graph 8 – McElmo Creek Unit Cumulative On-Farm Salinity Load Reduced



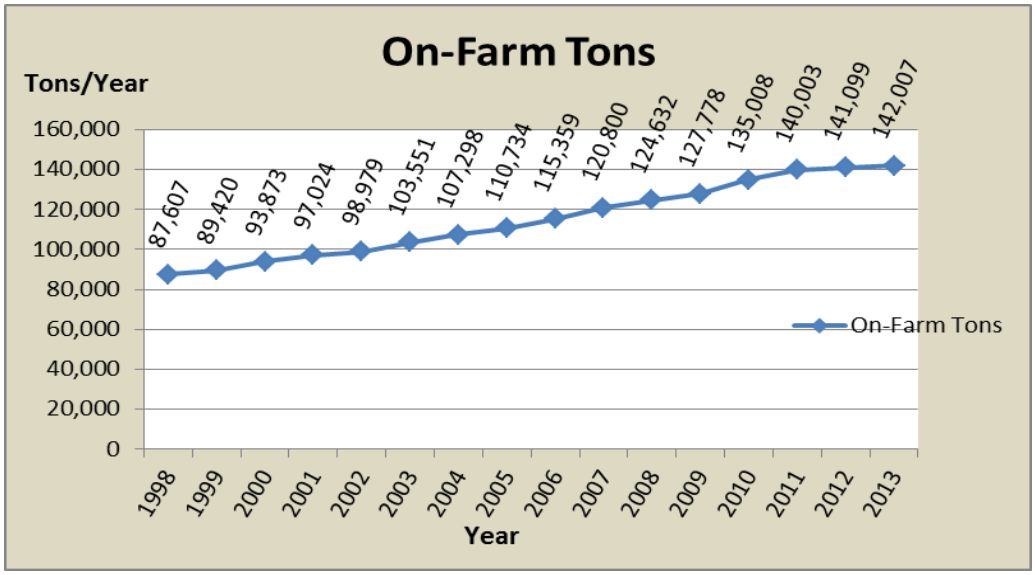
Graph 9 – Mancos Valley Unit Cumulative On-Farm Salinity Load Reduced



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

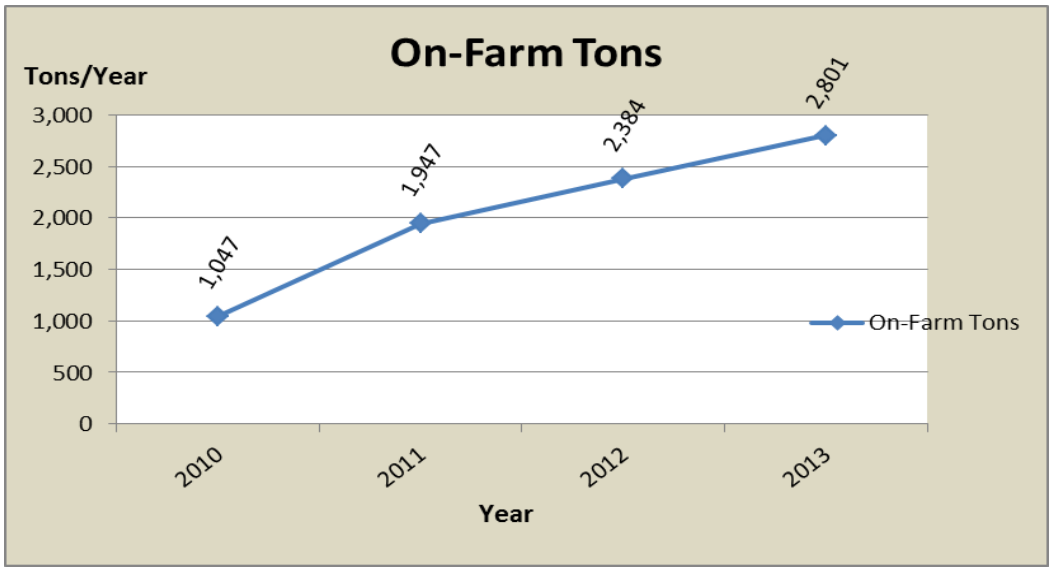


Graph 11 – Grand Valley Unit Completed Cumulative On-Farm Salinity Reduced, Includes 2013 Grand Valley EQIP as a Completed Project Unit



Note: The Grand Valley Unit was a designated salinity control project area from 1979 through 2012. The on-farm 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 per Year 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

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.

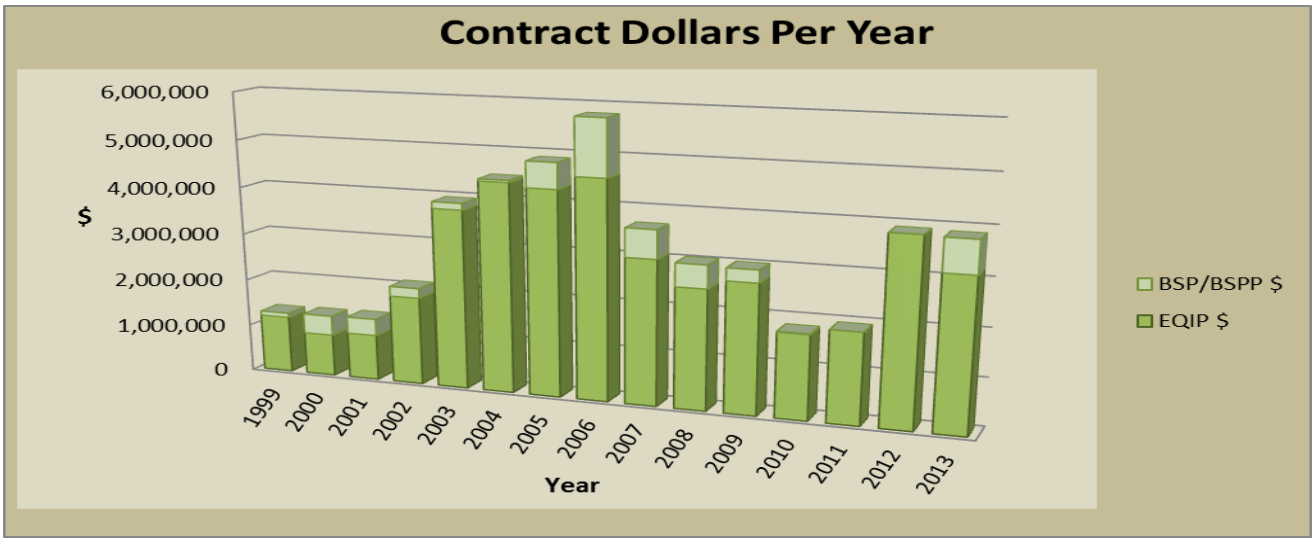
USDI-USBR Reported Salt Load Reductions from personal communication with Nicholas Williams, Environmental Engineer, US Bureau of Reclamation, Salt Lake City, Utah.

Colorado NRCS On-Farm Salinity Control Funding

Table 3 - On-Farm Programs for Funding Salinity Control

Program	Years
USDA Salinity Control Program (USDA-ACP)	1979 -1986
Colorado River Salinity Control Program (CRSCP)	1987 – 1995
Interim Environmental Quality Incentives Program (IEQIP)	1996
Environmental Quality Incentives Program (EQIP)	1997 -2012
Colorado River Basin States Program (BSP/BSPP)	1998 – 2012

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).

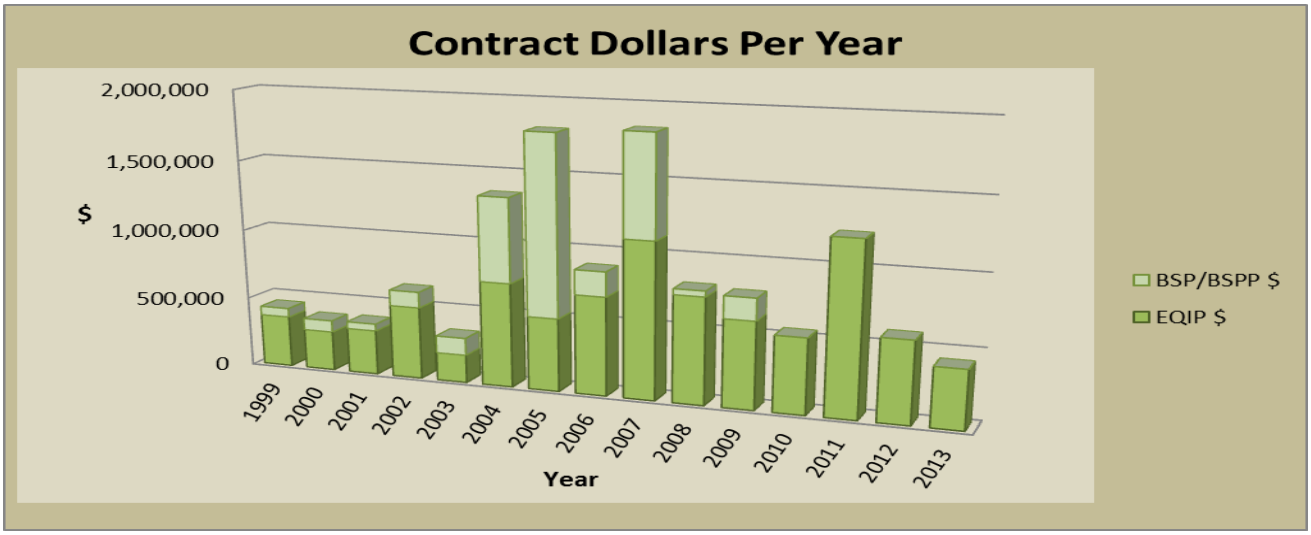
Graph 13 displays the Environmental Quality Incentive Program (EQIP) and Basin States Program (BSP/BSPP) contract dollars per year from 1999 through 2013. The amounts varied significantly on an annual basis in part due to program allocations, the local economy, the cost of the installed systems, and 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, 2010 and 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.

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 increase[/1] as the local economy improved.

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

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 1999 through 2013. 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

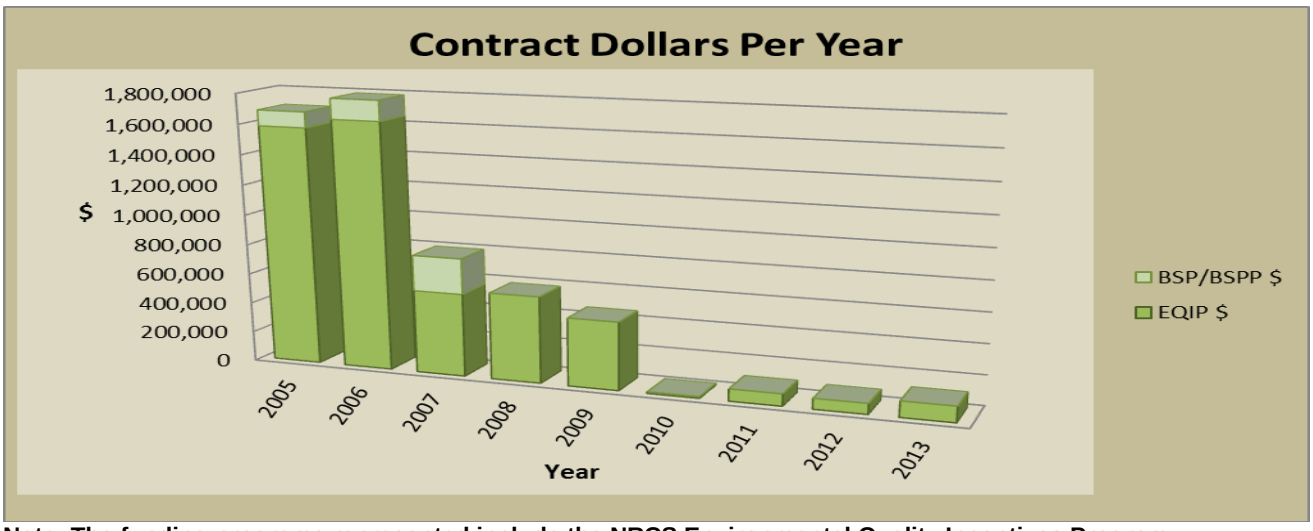
changes, additional management costs, the cost of learning and adapting new technologies, etc. are paid by the landowner and are typically not eligible for public cost-share.

Although the numbers fell within some of the previous annual contract dollar ranges, 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.

However, the number of applications for FY 2012 and FY 2013 were similar to the number processed in FY 2011, the average contract was smaller in size and obligated fewer contract dollars. In addition the re-funding of the Basin States Program in late FY 2012 should have allowed for 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 increase[/1] as the local agricultural economy improved. The data shows the FY 2013 trend in contract dollars is still relatively low and additional analysis may be needed to determine future salinity control irrigation improvement needs and opportunities.

[/1] Note: The 2013 payment schedules changed significantly at the national level and it was uncertain if the changes to payment schedule might have affected the rate of sign-up and participation for the 2013 FY.

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 1999 through 2013. The amounts varied significantly on an annual basis in part due to program allocations, the local economy, the cost

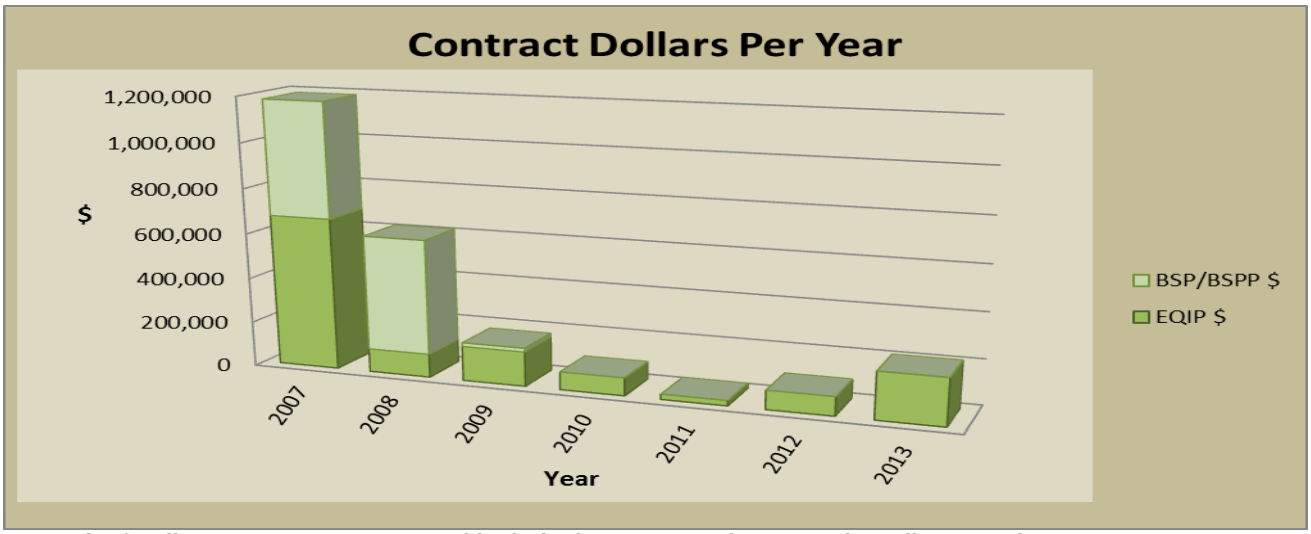
of the installed systems, and the landowner's ability to cover their portion of the cost. The public funding is typically intended to cover approximately 75 percent of the installation cost, however many of the peripheral costs such as getting power to the site, possible non-irrigation equipment changes, 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 2010 through 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 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. Plus it is assumed the re-funding of the Basin States Program will allow for additional future contracts with landowner's who may not be EQIP eligible, and it is thought the amount of both EQIP and BSP contracts will continue to increase[/1] as the local economy continues to improve.

The concern locally is the future program participation may be somewhat contingent on the development of more group pipeline projects to generate gravity pressure to make additional sprinkler systems more desirable. The local understanding is without more group delivery projects, the rate of implementation and 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.

[/1] Note: The 2013 payment schedules changed significantly at the national level and it is uncertain if the changes to payment schedule may have affected the rate of sign-up and participation for the 2013 FY.

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 1999 through 2013. 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.

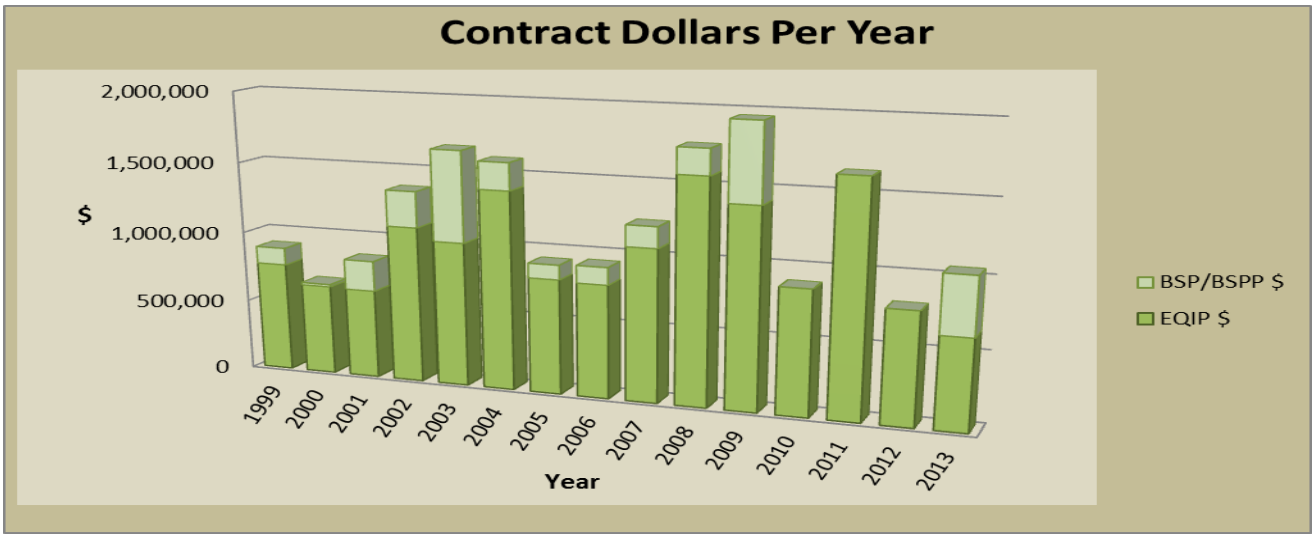
Although the numbers fell within some of the previous annual contract dollar ranges, 2010, 2011, and 2012 were relatively low contract years, although 2012 showed an increase from the previous two years. FY 2013 showed an increase in the dollars allocated due to one large contract. During FY 2010 and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

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 increase[/1] as the local economy improved.

In discussions with the Field Office 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.

[/1] Note: The 2012 EQIP salinity sign-up increased from 2010 and 2011, however the 2013 payment schedules changed significantly at the national level and it is uncertain if the changes to payment schedule may have affected the rate of sign-up and participation for the 2013 FY.

Graph 17 – Grand Valley Unit Completed Project 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).

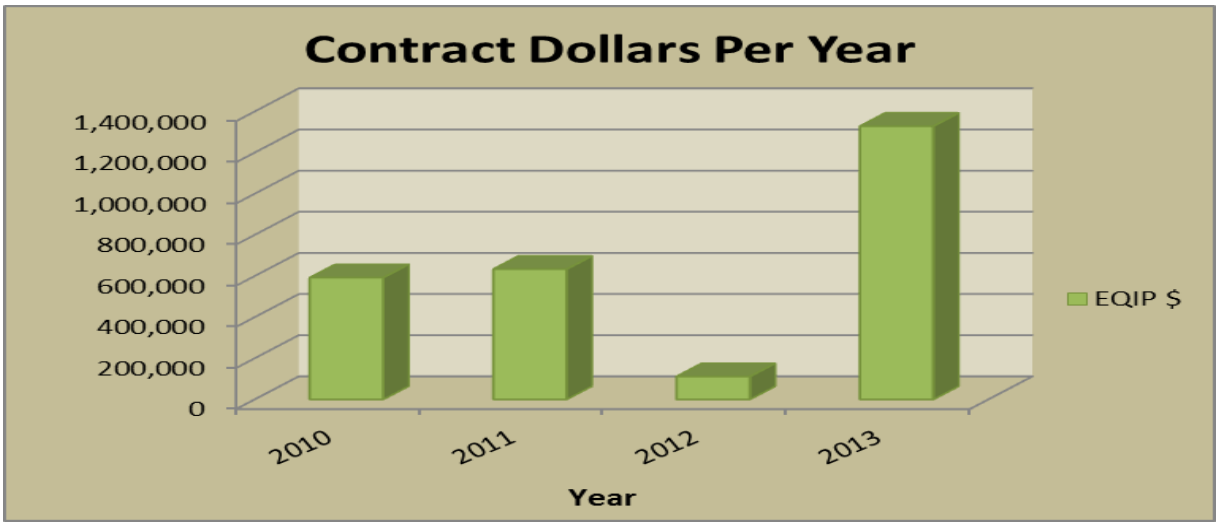
Graph 17 displays the Environmental Quality Incentive Program (EQIP) and Basin States Program (BSP/BSPP) contract dollars per year from 1999 through 2013. The amounts varied significantly on an annual basis in part due to program allocations, the local economy, the cost of the installed systems, and 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, 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.

In addition, the re-funding of the Basin States Program allowed for additional contracts with landowner's who are not EQIP eligible, and it is assumed the amount of both EQIP and BSP future contracts will stay relatively constant [/1] for the near future.

[/1] Note: The FY 2011 EQIP salinity sign-up increased significantly from FY 2010. FY 2012 returned to a level similar to 2010 and FY 2013 appears to be on a similar track, however the 2013 payment schedules changed significantly at the national level and apparently the changes to payment schedule did not appear to significantly affect the rate of sign-up and participation for FY 2013.

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.

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 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 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 2013 Highlights

Lower Gunnison Unit – Delta and Montrose Field Offices - FY 2013 Outreach and Irrigation Water Management Highlights

Since the Colorado River Basin salinity program's start in the Lower Gunnison Unit in 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 2012 – Participated in a Drought Workshop for irrigators
- October 2012 – Participated in a Hispanic and Women Farmer Rancher meeting to discuss and promote NRCS and Salinity Program opportunities
- October 2012 – Newsletter to local community about NRCS programs, special initiatives, and funding opportunities to promote additional participation in conservation, salinity control, water management, and soil health
- October 2012 – Participated in the Lower Gunnison Salinity Study Listening Session
- November 2012 – Presentation at the local high school to educate students about agricultural and water management on Mancos Shale derived soils
- December 2012 – Participated in the Ditch and Reservoir Company Alliance meeting to provide information about the salinity program, BSP, and other funding opportunities
- December 2012 - Two presentations at local schools to educate students about agricultural and water management on Mancos Shale derived soils.
- December 2012 – Article on the Soil Health Initiative highlighting the efforts of a local producer to promote soil health to improve crop quality, crop production, efficient water use, and improve water quality
- January 2013 – Information provided on EQIP program assistance at the Soil Health Conference
- January 2013 – Drought presentation and the Western Slope Food and Farm Forum
- February 2013 – Photographed and documented Soil Health and Irrigation Management practices for the Delta Soil Health Conference

Salinity Outreach Activities (continued):

- March 2013 – IWM Specialist irrigation class for Delta County Future Farmers of America students that included on farm system tours and local reservoir and ditch company tours.
- April 2013 – IWM Specialists provided information via flash drives on Soil Health, Drought Irrigation Management, and Irrigation Water Management Practices to 35 producers
- April 2013 – IWM Specialist presentation at a Small Pasture Management Workshop on irrigation water management, estimating soil moisture with the hand-feel method, and irrigated pasture management. Also provided NRCS Field Irrigation Booklets and NRCS Estimating Soil Moisture by Feel and Appearance to 20 producers at the workshop.
- May 2013 – IWM Specialist Participated in the Paonia River Park Festival. Gave talks about the river and how it relates to irrigation and water use. Gave demonstrations with the Riparian Trailer for approximately 100 middle school students.
- May 2013 – IWM Specialist spoke at the Surface Creek Republican Women's Meeting to 14 local producers about EQIP and BSP programs.
- May 2013 – IWM Specialist made a Power Point presentation to Botanical Society members about drought irrigation techniques, methods of measuring and estimating soil moisture with probes, the hand-feel method of estimating soil moisture, and monitoring soil moisture with Hanson Data Loggers to 24 participants in Montrose.
- May 2013 IWM Specialist provided information to 10 producers on Soil Health, Irrigation Water Management, and Drought Irrigation Management and provided each producer with the information on a flash drive
- May 2013 – IWM Specialist attended a field day in Longmont and provided information to the group on the Soil Health Initiative and salinity control. Participants included 6 NRCS District Conservationists, 36 producers, and 4 conservation tillage equipment dealers. Other presentation included conservation tillage equipment demonstrations, producers sharing conservation tillage experiences, and the IWM Specialist made contact for 8 potential speakers for the 2014 Soil Health Conference in Delta, including a field demonstration day.
- May 2013 – IWM Specialist Participated in the Paonia River Park Festival. Gave talks about the river and how it relates to irrigation and water use. Gave demonstrations with the Riparian Trailer for approximately 100 middle school students.
- May 2013 – IWM Specialist spoke at the Surface Creek Republican Women's Meeting to 14 local producers about EQIP and BSP programs.
- May 2013 – Biologist and District Program Support Specialist taught approximately 50 3rd graders from Hotchkiss Elementary about soil and water erosion on riparian area and on farms and ranches. Discussed why it's important to keep our water clean and hit on the salinity issue in our area and how it turns into a bigger issue downstream.
- May-Sept. – IWM Specialist assisted 4 producers with taking soil and tissue cultures to be sent for soil health and plant health analysis
- May-Sept. 2013 – IWM Specialist assisted 7 producers with flow measurement and calibration of existing measurement devices by using the GE ultrasonic flow measurement device, portable ramp flume or portable parshall flume.
- May-Sept. 2013 – IWM Specialist assisted 10 producers with questions regarding system operation and maintenance for existing systems, and with troubleshooting on existing systems.
- June 2013 – Conservation District Staff assisted two high school teachers and one college professor for curriculum assistance

Salinity Outreach Activities (continued):

- July 2013 - IWM Specialist assisted manager of the Escalante State Wildlife area with irrigation management on a large area of irrigated fields.
- August 2013 – Emailed and forwarded Soil Health meeting notices, minutes, and Soil Health articles to 133 producers for both July and August meetings to support soil health, crop and soil management, and irrigation water management providing additional salinity control and overall resource improvement.
- August 2013 – IWM Specialist assisted two producers in researching and implementing fertigation techniques to comply with state chemigation requirements for licensing. Both systems were center pivot irrigation systems and assistance included injector pump sizing, injector pump calibration, system layout and calculations to determine ml per min injection rates for each of the seven fields to be fertilized with organic fish emulsion.
- September 2013 - Represented the Conservation District and Salinity Control at two meetings of the Food and Farm Forum with 6 other committee members to organize the 2014 conference featuring water management.

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

The 2013 year saw additional improvements in the Irrigation Water Management (IWM) program for the Delta and Montrose field offices. The 2013 IWM program was initiated in early spring through contacts with producers having IWM scheduled in their 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 2013, 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 2013 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 2013 IWM activities

The Delta Irrigation Water Management (IWM) Specialist made **163 visits** to assist contract recipients with the principles of Irrigation water management. This resulted in the certification of IWM practices in **35 contracts**. These 35 contracts represented **1,382 acres**, of which 710 acres were hay, 467 acres were pasture, 137 acres were row crops, and 68 acres were specialty crops. Producers with contracts were also provided with USB flash drives containing drought and soil health information. Throughout the 2013 season, the Delta IWM Specialist installed **5** Hanson Water Loggers/sensors, and also assisted planning staff with collection of soil samples and tissue samples from many of the contract properties. IWM plans were developed for **22 new contracts** in the 2013 fiscal year.

In addition the Delta IWM Specialist made **30 Conservation Technical Assistance (CTA)** visits to non-salinity contract irrigators to provide technical help for an additional 1,060 acres. 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 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. The Delta IWM specialist also provided assistance to **4 multi-user canal companies** with flow measurement and operation options as well as assisting **8 producers** with proper flow measurement and calibration of existing flow measurement devices.

During the 2013 season the Delta IWM Specialist participated in a number of educational projects including; working with CSU Extension on the soil moisture and water management data for the CSU Experimental Test Plot at the Hotchkiss Fair Grounds, and organizing and presenting an irrigation class for Delta County Future Farmers of America students that included on farm system tours and local reservoir and ditch company tours. The IWM Specialist also made presentations to various local groups about water, irrigation, drought, soil health and irrigation efficiency. An example of this would be his presentation at the 2013 Western Colorado Food and Farm Forum where he spoke about irrigation in drought years with an emphasis on pre-drought planning and small farm drought mitigation planning.

The Delta IWM Specialist attended training sessions throughout the year with the Area Engineer and Area Irrigation Specialist to improve skills in various irrigation water management topics to improve technical knowledge necessary to continue to provide quality irrigation assistance in the future.

Lower Gunnison Unit - Montrose Field Office – FY 2013 IWM activities

The Montrose Irrigation Water Management (IWM) Specialist made **151 visits** to assist contract recipients with the principles of Irrigation water management. This resulted in the certification of IWM practices in **47 contracts**. These 47 contracts represented **1,549 acres**, of which 965 acres were hay, 100 acres were pasture, 270 acres were row crops, and 214 acres were specialty crops. Producers with contracts were also provided with **45 USB flash drives** containing drought and soil health information. Throughout the 2013 season, the Montrose IWM Specialist installed **6** Hanson Water Loggers/sensors, and also assisted planning staff with collection of **21 soil samples** and performed nitrate leaf samples with **5 growers**. IWM plans were developed for **18 new contracts** in the 2013 fiscal year. **Six contracts** selected medium and high intensity irrigation water management specifying an ETc Water Balance for irrigation scheduling as part of their payment incentive Irrigation Water Management Practice. The Irrigation Checkbook Method was used to help schedule their irrigation and Hanson Data Loggers or Irrometers were used to record soil moistures levels and estimated ETc amounts, and to help fine-tune the irrigation scheduling.

In addition the Montrose IWM Specialist made **21 Conservation Technical Assistance (CTA)** visits to non-salinity contract irrigators to provide technical help for an additional **1,053 acres**. 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 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 2013 the Montrose IWM Specialist chaired or served as Secretary for **9** Soil Health meetings, coordinated the 2013 Cover Crop Fall Tour and coordinated the Producer Panel for the 2013 Soil Health Conference at which over **250 people** participated, and served on the Steering Committee in planning the 2014 Soil Health Conference. IWM Specialist maintains email list for area Soil Health Team and sends out all correspondence and new ideas relating to Soil Health practices.

The IWM Specialist made or coordinated **17 presentations** to various groups or classes involving over 400 people on topics ranging from Conservation Practices to Irrigation Water Management and Cover Crops, and served on the Steering Committee of the Montrose Valley Food Partnership in planning the 2014 Food and Farm Forum making many speaker contacts for this Agricultural Forum. The IWM Specialist researched and documented the Shavano Conservation District Irrigated Crop Summary for 2013 for the Board of Supervisors to set a base-line of crop acreage and future cover crop acreage increases, documenting the total acreage and species composition of Delta-Montrose area growers who are raising cover crops in the Uncompahgre Valley. Staff wrote and provided pictures for 3 newspaper articles detailing these studies

The Montrose IWM Specialist attended training sessions throughout the year with the Area Engineer and Area Irrigation Specialist to improve skills in various irrigation water management topics to improve technical knowledge necessary to continue to provide quality irrigation assistance in the future.

Lower Gunnison Unit – Delta and Montrose Field Offices - FY 2013 Irrigation Water Management 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 ~~i~~ for irrigation system operation and maintenance and proper water management. The IWM Specialists, through workshops, field days, tours, news articles and coordination with CSU Extension, irrigation equipment suppliers, Conservation District Boards, and irrigation water districts, can continue to bridge the gap between producers and the latest advancement of irrigation technology.

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.

The guidance document developed in 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 a valuable tool in providing effective follow-up and monitoring for acquiring data in order to make effective recommendations for improvements in management. Additional training is needed for the newly employed IWM specialists to fully utilize the tools in the Lab, such as the salinity mapping and analysis tools, and infiltrometers.

The MIL resource was utilized more efficiently in 2013 through:

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

McElmo Creek and Mancos Valley Units - Cortez Field Office - 2013 Outreach and Irrigation Water Management Highlights

Since the salinity program's inception in the McElmo Creek Unit in 1989 and the Mancos Valley Unit in 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 Basin Salinity Control Program (CRBSCP). Funding for the CRBSCP 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

- December 2012 – Provided information on the salinity program and other NRCS activities at the Dolores Conservation District Annual meeting
- January 2013 – Provided a Water 101 presentation to 70 participants on the fundamentals of irrigation water management
- March 2013 – Presentation to beginning farmers and irrigation and salinity control
- March 2013 – Presentation on salinity control at the Ag Expo
- March 2013 – Staffed a booth at the Ag Expo highlighting salinity control, irrigation systems improvement, and the programs and assistance available through the Conservation District and NRCS partnership.
- April 6 2013 – Ag water assessment / IWM meeting

McElmo Creek and Mancos Valley Units - Cortez Field Office - FY 2013 Irrigation Water Management (IWM) Activities

A large emphasis was placed on Irrigation Water Management (IWM) in FY2013. Staff conducted an “In-the-Field Irrigation Water Management Class” that included participants from both the McElmo and Mancos project areas. An Irrigation Water Management booklet was provided to each participant. In April an Agricultural water assessment meeting was held to help producers evaluate existing systems and improve IWM, **15 producers attended**. **Twenty-eight producers** signed up to do formal assessments on existing systems.

Conservation District and Field Office staff conducted **11 sideroll sprinkler evaluations** on **244 acres** in the McElmo Project area. The **11 assessments** were completed using bucket tests and flow meters to verify flow and uniformity of water application. Dolores Conservation District provided cost share for **re-nozzling 3** of these systems after the assessments indicated the need. Staff developed **19 IWM Plans** on **500 acres** in McElmo, and developed **4 IWM Plans** on **14 acres** in Mancos.

The IWM follow-up resulted in certification of the Irrigation Water Management (IWM) practice on **744 acres** on salinity contracts within the McElmo Creek Unit, and **94 acres** on salinity contracts within the Mancos Valley Unit. In addition, under regular Conservation Technical Assistance (CTA) an additional **110 acres of IWM** was certified within the McElmo Creek Unit and **2,439 acres of IWM** were certified on Ute Mountain Ute Tribal lands. Although the CTA IWM acres do not have a quantified salinity reduction measurement, they do provide some level of additional deep percolation reduction and contribute to the overall water conservation and salinity control efforts.

Planners made a concerted effort to perform a field visit with all producers receiving an irrigation water management payment in 2013. During this field visit the planners review the IWM principles and assist the producer to perform various management techniques, predominantly the “hand feel” soil moisture test prior to certification of the producers IWM records for all contracts.

Staffing changes were made to help improve irrigation water management training to producers. The retirement of the irrigation water management specialist left a void in staff with advanced irrigation water management leadership to provide technical support for IWM and training. In an effort to fill this void a Basin Salinity Technician is in the process of being retrained to increase their technical skills and will be re-directed to provide approximately 50% of their time to work with landowners on IWM instruction and IWM implementation. During this time the individual assigned IWM responsibilities is working with experienced IWM staff in the Montrose and Delta salinity offices to receive training and support to improve their technical expertise.

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 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 Program.
3. The goal of IWM program is to provide the necessary assistance and information to help the Salinity 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 be conducting two additional Irrigation Water Management 101 courses for program participants during the 2014 irrigation season.
6. Twenty side-roll sprinkler systems will be evaluated for system performance and to assist the irrigator with water management options during the 2014 irrigation season.

Silt Unit – Glenwood Springs Field Office – FY 2013 Outreach and Irrigation Water Management Highlights

Since the salinity program's inception in the Silt Unit in 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 Basin Salinity Control Program (CRBSCP). Funding for the CRBSCP 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

The Bookcliff Conservation District and NRCS scheduled and advertised a salinity meeting for interested landowners in the Silt Unit and only had **2 RSVP**. The initial meeting was canceled due to the low interest. Some type of additional outreach and analysis may be needed to gauge landowner interest in the salinity control program in the Silt Unit.

Silt Unit – Glenwood Springs Field Office - 2013 Irrigation Water Management Highlights

In FY 2013 NRCS and the Bookcliff Conservation District had **3 new** Salinity contracts covering **138 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 2013 NRCS and the Bookcliff Conservation District worked with **13 existing** contracts covering **164 acres** on their IWM follow-up and practice certification. During the 2013 irrigation season **2 can tests** were conducted on center pivot irrigation systems to verify uniformity of nozzle application rates.

Silt Unit – Glenwood Springs Field Office - FY 2013 Irrigation Water Management (IWM) Activities

The staff completed irrigation water management assessment and certification on a total of **30 landowners** covering **756 acres** from irrigation information collected and irrigation assistance provided to landowners during the 2013 irrigation season.

Glenwood Springs IWM Specialists Report

- The Glenwood Springs NRCS office has **34 EQIP contracts** with Irrigation Water Management scheduled for 2013 covering **772 acres**. Nine (9) are in Eagle County with 130 acres, 22 are in Garfield County with 368 acres, and 3 in Pitkin County with 274 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.
- As of December 13, 2013 the IWM Specialist contacted and provided assistance to all **34 landowners** in all the counties covered by Glenwood Springs
- 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.

Glenwood Springs NRCS Planners/Engineers Report

- NRCS Planners and Engineers continue to help contract holders outside the salinity area with IWM. The IWM Specialist is assigned specifically to support water management within the Silt Salinity Control Unit.

Silt Unit Irrigation Water Management (IWM) Summary and Outlook

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 amounts they applied for the season, with recommendations on how to improve their irrigation management in 2014 season. Soil moisture probes were provided to each irrigator with instruction on their use, to provide management tools and information to the irrigators/operators on soil moisture monitoring and irrigation scheduling.

Grand Valley Unit Completed Project Grand Junction Field Office – FY 2013 Outreach and Irrigation Water Management Highlights

Since the salinity program's inception in 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 (CRBSCP). Funding for the CRBSCP 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 – November 2012 – Completed seven events to promote irrigation water management, crop management, soil health, and crop water requirements
- December 2012 – Article on the Tamarisk Coalition to NRCS State Newsletter
- March 2013 – Water trailer presentation on hydrology and salinity control for 40 students and adults at the Redlands Methodist Preschool
- May 2013 – Water Trailer presentation on hydrology and salinity control 2,600 students and adults at Palisade Outdoor Heritage Days
- May 2013 - Salinity Closeout Event-125 attendees. Included tour, dinner and closeout ceremony.
- May 2013 – Chanel 11 News interview and report on Salinity Program and Closeout
- May 2013 – Children's Water Festival, 1,070 Students and Teachers educated about water, soil and salinity issues
- May 2013 – Salinity Closeout Summary in the NRCS Colorado Connections Newsletter
- May 2013 - Water trailer presentation on hydrology and salinity control for 36 Teachers for T.E.N Project
- May 2013 – Colorado River Foundation Tour – Presentations about irrigation in the Grand Valley and Salinity Control for 40 people on tour in multiple presentations.
- June 2013 – Mountain Valley News – Salinity/Project Funding Article in the Mountain Valley News (Front Page)
- June 2013 - Water trailer presentation on hydrology and salinity control for 90 Students and about 10 Teachers at VBS Science Classes at FUMC-Grand Junction.
- July 2013 – Article about irrigation in the Grand Junction Daily Sentinel.
- August 2013 – Presentation at Irrigation Tour about irrigation and salinity control in the Grand Valley, in conjunction with CSU Extension.

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

Beginning in 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 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 2013 IWM Activities

Visits were made to provide water management assistance, and to check and certify Irrigation Water Management (IWM) on **101 farms** during FY 2013. The FY 2013 irrigation water management activities include: completing **73 IWM reviews** on **616 acres** for the contracts with planned IWM, provided **26 irrigators** with in-field technical assistance for irrigation water management, soil health, irrigation system and crop management options. IWM plans were developed for **28 new contracts** funded in FY 2103 on **413 acres**. Hanson Data Loggers and

soil moisture sensors were installed on **12 sites** covering most of the contracted acres to assist the irrigators with soil moisture monitoring and irrigation scheduling**.**

The Conservation District IWM Specialist is initiating a program with local students 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 2013 Irrigation Water Management 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, can continue to bridge the gap between producers and the latest advancement of irrigation technology.

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.

Grand Valley Unit Completed Project - Conservation District and CSU Extension Projects

Mesa Conservation District is working with CSU Extension to conduct a deficit irrigation project on peach orchards. Withholding water and deliberately stressing peaches can actually reduce the amount of water applied and may not hurt crop production or crop quality. In agriculture, the actual reduction in crop water use or a defined water savings are typically not possible, because the crop is going to consume the same amount of water regardless of the irrigation system application efficiency. However the stress study indicated with some crops a reduction in consumed water may be possible. On one peach orchard site, 9.6 inches of water was saved with a $10 per acre saved in pumping costs, and a predicted reduction of 668 lbs of salt per acre into the river, and result in no net change in the crop production. On the second site there was a 21 inch reduction in the amount of water consumed with a $22 per acre saving in pumping costs, and a predicted reduction of 1,467 lbs salt per acre into the river. However at this level of water deficit, there was a noted reduction in peach size. The deficit study project will be continued in 2014.

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 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 2013 include:

- 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, and the Water Quality Incentive Initiative. 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 importance of maintaining financial incentives at levels that encourage program participation cannot be overemphasized. It is anticipated there may be emerging issues as applicants adjust to the financial uncertainties with a somewhat soft economy and the new national level payment schedules. It is unclear at this time what level of net compensation a participant will receive relative to their actual cost of financing and adapting to the improved irrigation systems. During periods of transition and change the rates of participation are often a little lower as the local community waits to see how the current payment rates works for their neighbors.

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 USFWS 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.

It is currently assumed the estimated 115,000 acres as adjusted due to changing land-use, is still an achievable number, but it is somewhat unclear how many years may be needed to reach the final goal. In addition, there are irrigation improvement being made without Federal participation and the acres on the ground that are actually treated may be a desirable inventory to complete. 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 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.

It is anticipated there may be emerging issues as applicants adjust to the financial uncertainties with a somewhat soft economy and the new national level payment schedules. It is unclear at this time what level of net compensation a participant will receive relative to their actual cost of financing and adapting to the improved irrigation systems. During periods of transition and change the rates of participation are often a little lower as the local community waits to see how it works for their neighbors.

The implementation of the NRCS IWM tool for 2013 contracts and the 2 year commitment for follow-up will provide additional salinity control for the program, and help the producer improve crop quality. Two years of follow-up assistance is being included in the current conservation plans. NRCS planners will continue using the IWM Tool to assist in developing the conservation plans for all salinity control and water quality improvement contracts.

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 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.

In the Mancos Valley Unit the Weber Ditch submitted a project proposal for US Bureau of Reclamation funds to pipe their delivery ditch. If approved, it is assumed piping the irrigation delivery system will encourage producers to participate in the NRCS or BSP on-farm program, and the delivery of piped irrigation water will likely encourage more irrigators to adopt the higher efficiency sprinkler or micro-spray system.

Silt Unit – Glenwood Springs Field Office - Future Outlook

Applications for FY 2014 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 IWM 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 to determine if the original estimated 2,800 acre irrigation treatment goal is still needed and achievable. If the treatment acres need to be adjusted, additional analysis by a qualified Biologist may be needed to determine the amount and types of 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 will be hosting additional meetings within the Silt Salinity Unit to get feedback on the program activities and to gauge future participant interest.

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

Recommendations for Future Monitoring and Action

- For 2014, 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 "checkbook" 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 parcels are being subdivided into 10 to 40 acre parcels 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 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 has led to additional complaints and operation problems. The EQIP requirements for being a qualified agricultural producer and each participant having an individual contract are not well suited to provide cost share for improving these mixed agriculture and sub-urban systems. The Basin States Program (BSP) and the Agricultural Water Enhancement Program (AWEP) are probably more flexible with the mix of agricultural and non-agricultural water users, and will be the programs 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 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. There is still interest for some irrigation improvements and systems 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 system. 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
- 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.

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, 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.

The Out-of-Project area irrigation improvements funded in FY 2013 averaged **$93.22** amortized cost per ton while the established salinity control units ranged from **$82.32** to **$200.64** amortized cost per ton. The out-of-project area amortized costs were lower than all of the established salinity control units in Colorado except for the McElmo Creek Unit.

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 four years this option has been available the annual funding not used in the established project areas varied from $111K to $1.3M.

The NRCS currently uses the EQIP site specific environmental analysis process to determine the environmental effects from each individual OPA project. Additional analysis and tracking may be needed to assure the site specific environmental analysis is adequately quantifying the impacts to irrigation enhanced wildlife habitats.

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 1979 through 1983, then the Colorado River Salinity Control program (CRSCP) from 1984-1995. The next program was the Interim Environmental Quality Incentives Program (I-EQIP) for fiscal year 1996. The current program, from 1997 through 2013 is the EQIP Program which includes matching funds from the Bureau of Reclamation delivered through the Basin States Program (BSP/BSPP).

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 “**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. Pheasant was chosen to represent habitat diversity, edge effect and edge habitat. Yellow warbler to represent cottonwood-willow and other woody habitat associated with irrigation ditches and tail water, Mallard breeding habitat to represent shallow wetlands and nesting habitat surrounding these wetlands. Mallard –winter habitat to represent winter roosting areas (large water bodies and ice free water) and management of crop residues. Meadow vole to represent sedge- rush wet meadows often associated with leaky ditches and inefficient irrigation, Marsh wren to represent cattail- bulrush (robust emergent) wetlands, and Screech owl 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 evaluation and accounting using the HEP process was an effective tool to measure the impacts and to determine the 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 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 small and disconnected 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 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 or 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 change also included the Mancos Valley Unit.

The Grand Valley Unit had a separate negotiated 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 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[1/], the US Fish and Wildlife Service reviewed the biological evaluation and concurred with the established replacement goal. It is unknown what the replacement needs with 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 habitat replacement goal, the goal for each project area is to be concurrent, meaning the 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 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. 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 must be on the ground and functioning as effective habitat when the salinity project is considered complete. Some loss of wildlife habitat will continue to take place as operation and maintenance agreements expire and land uses change in each salinity control unit. To account for the loss, it is likely NRCS will need to apply more habit replacement acres than the goal amount. NRCS Biologists will visit all habitat replacement projects every three (3) years and adjust credited acres to what is actually on the ground and functioning. Acres lost for whatever reason will be removed from the credited replacement acres.

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 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 **55%** of the acreage treatment goal and approximately **69%** of the projected salinity reduction goals in the Lower Gunnison Unit. The goal for each project area is to be concurrent, meaning the habitat replacement should be adequate to meet the replacement values for the applied irrigation system improvements in place. With **63,675 acres** with irrigation treatment to date, at 2 acres of habitat per 100 acres of irrigation system treatment, the concurrent habitat replacement goal is **1,270 acres**, see Table 4, page 68. With **1,191 acres** of replacement wildlife habitat applied and in place to date, the Lower Gunnison Unit needs an additional **79 acres** of habitat replacement to be concurrent [/1]. ***See "FY 2012 Wildlife Activities" on the following page for progress and actions.***

[/1]Depending on how many irrigated acres are ultimately treated for salinity control, it is estimated that the final 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 Basin Salinity Control Program (CRBSCP).

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 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 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 2013 Wildlife Activities

At the time the change was made to go to the 2% replacement amount in 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 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 2007 to 2013, 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 2007 and 2013, which is helping gain the acres needed to be concurrent.

In 2007, when the NRCS and USFWS agreed to the 2 acre per 100 acres habitat replacement goal, the Lower Gunnison Unit was at 60 percent of the 2% concurrent acreage replacement goal. Over the past 5 years additional emphasis has been placed on increasing the number and size of habitat replacement projects. The wildlife habitat replacement totals in 2009, 2010, 2011 2012, and 2013 in the Lower Gunnison Unit increased each year respectively to **60%**, **66%, 72%, 81% and 93%** of the **concurrent goaled acres**. This trend is expected to continue into the future, so it is projected the Lower Gunnison Unit will be fully concurrent by FY 2019 or possibly even sooner if the increased FY 2013 trend continues.

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.

For 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	63,516
Habitat Replacement Goal @ 2 acres per 100 acres Irrigation Treatment	1,270
Habitat Replacement Acres Applied and Maintained through FY 2012	1,008
Habitat Replacement Acres Applied During FY 2013	183
Total Habitat Replacement Acres Through FY 2013	1,191
Remaining Acres to Meet Concurrent Habitat Replacement Goal	79
Remaining Acres Needed to Meet Full Project Replacement Goal [1/]	1,109

Note the rose colored boxes are negative or a deficit

[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 habitat replacement needed.

As displayed in Table 4, the Lower Gunnison Unit is currently **79 acres** below the concurrent replacement needed, however this is a significant improved of the previous years, indicates significant gains are being made each year. Continued 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.

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

	Office	Combined Delta and Montrose Field Offices									
Program	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	2007-2012	23.2	23.2	14.4	14.4	2/	295.1	295.1	244.7	244.7	2/
	2013 /3	16.1	**39.3**	0.0	**14.4**	2/	194.3	**489.4**	0.0	**244.7**	2/
BSP/BSPP	1997-2012	65.5	65.5	55.1	55.1	**84%**	184.7	184.7	178.8	178.8	**97%**
BSP/BSPP	2013 /3	0.0	**65.5**	0.0	**55.1**	2/	0.0	**184.7**	0.0	**178.8**	2/
	Total		**471.7**		**293.8**			**1,552.4**		**897.1**	
Total Habitat Replacement Acres Applied											1,190.9

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

[2/] The majority of the 2007 though 2013 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.

[3/] The Delta and Montrose Field Offices report the applied habitat acres on the row for the year each project was planned. The 7.8 acres of wetland habitat and the 175.4 acres of habitat replacement reported as applied in FY 2013, are included as part of the applied number for the 2007 - 2012 years the projects were planned.

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

CRSCP/EQIP/ I-EQIP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1988 to 2012	$57,834,313
Funds Obligated to Salinity 2013	$3,171,777
Funds Obligated to Wildlife Projects 1988 to 2012	$1,631,435
Funds Obligated to Wildlife Projects 2013	$193,842
Funds Spent on Wildlife Projects 1988 to 2012	$855,056
Funds Spent on Wildlife Projects 2013	$103,741
Percent of Total Salinity Funds Obligated to Wildlife Projects 1988 to 2013	3.0%
Percent of Total Salinity Funds Spent on Wildlife Projects 1988 to 2013	1.6%

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

BSP/BSPP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1997 to 2012	$4,684,926
Funds Obligated to Salinity 2013	$812,529
Funds Obligated to Wildlife Projects 1997 to 2012	$397,616
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1997 to 2012	$300,054
Funds Spent on Wildlife Projects 2013	$5,985
Percent of Total Salinity Funds Obligated to Wildlife Projects 1997 to 2013	7.2%
Percent of Total Salinity Funds Spent on Wildlife Projects 1997 to 2013	5.6%

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

All Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1979 to 2012	$62,519,239
Funds Obligated to Salinity 2013	$3,984,306
Funds Obligated to Wildlife Projects 1979 to 2012	$2,029,051
Funds Obligated to Wildlife Projects 2013	$193,842
Funds Spent on Wildlife Projects 1979 to 2012	$1,155,110
Funds Spent on Wildlife Projects 2013	$109,726
Percent of Total Salinity Funds Obligated to Wildlife Projects 1979 to 2013	3.3%
Percent of Total Salinity Funds Spent on Wildlife Projects 1979 to 2013	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 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 habitat replacement goal is 2% of the acres treated for salinity. To date **63,675 acres** have been treated with salinity practices. To be concurrent with project application, **1,270 acres** of habitat replacement should currently be on the ground and functioning. To date **1,191 acres** of habitat replacement are applied on the ground and functioning. The project is currently at approximately **93%** of the concurrent 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 habitat replacement acres applied periodically. So while wildlife replacement acres are continually being installed, some acres are being lost. Urban development, changes in management changes in land ownership, and contracts that are past their effective lifespan are major reasons that some acres no longer met habitat replacement criteria and have been removed from the annual accounting system

NRCS is currently **79 acres** below concurrent habitat replacement goals. To be concurrent with salinity project implementation, NRCS will continue to place a high priority on habitat replacement.

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, BSP, 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, although the Lower Gunnison Unit is behind in meeting their concurrent acreage replacement goals, 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 come closer to being concurrent each year. 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 **69%** of the acreage treatment goal at **14,873 acres** and approximately **57%** of the projected salinity reduction treatment goals for the McElmo Creek Unit. The goal for each project area is to be concurrent, meaning the 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 habitat replacement goal is **297 acres**, see Table 9, page 72. The McElmo Creek Unit **exceeds** the concurrent wildlife habitat replacement goal by **154 acres** of wetland habitat.

Pending the results of the habitat inventory and evaluation the project area may have sufficient habitat replacement in place to exceed 100% of the RCS goal at the time of project completion. Depending on how many irrigated acres are ultimately treated it is estimated the final habitat replacement goal will be approximately **431 acres** based on the predicted treatment levels.

Table 9 – McElmo Creek Unit Wildlife Habitat Replacement Table

Habitat Replacement	Acres
Salinity Program Irrigated Acres Treated to Date	14,873
Habitat Replacement Goal @ 2 acres per 100 acres Irrigation Treatment	297
Habitat Replacement Acres Applied and Maintained through FY 2012	451
Habitat Replacement Acres Applied During FY 2013	0
Total Habitat Replacement Acres Through FY 2013	451
Remaining Acres to Meet Concurrent Habitat Replacement Goal [1/]	154
Remaining Acres Needed to Meet Full Project Replacement Goal [2/]	20

Note the green boxes indicate extra or plus acres

[1/] Within the McElmo Creek project area there are 451 acres of wetland habitat reported through FY2013 and 809 acres of upland habitat reported. It is initially assumed all of the wetland acres should provide suitable replacement habitat, however it is unknown whether any of the upland habitat will meet suitable replacement requirements, so the upland acres are not included in the initial total. A preliminary field inventory and assessment was started during FY 2013. However, additional assessment will be needed to determine the actual habitat replacement acres still in place and suitable to meet salinity replacement habitat requirements. Additional work is currently being done to update the habitat inventory so the final field assessments can be conducted. The final inventory is scheduled to be completed during the spring and summer of FY 2014, and final adjustments to the habitat replacement numbers will be updated in the FY 2014 reports.

[2/] Assume a full project implementation at 21,550 acres of irrigation treatment at 2 acres per 100 acres irrigation improvement, for a total 431 acres of habitat replacement needed, or the current habitat acres are sufficient to meet 105% of the full project replacement goal.

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

Program	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	1990-1996	297.3	**297.3**	294.7	**297.3**	**100%**	277.8	**277.8**	152.9	**152.9**	**55%**
IEQIP/EQIP	1996 - 2006	93.3	**93.3**	35.6	**35.6**	**38%**	494.1	**494.1**	450.4	**450.4**	**91%**
EQIP	2007-2012	133.6	133.6	118.7	118.7	3/	206.5	206.5	206.5	206.5	3/
	2013	5.0	**138.6**	0.0	**118.7**	3/	0.0	**206.5**	0.0	**206.5**	3/
BSP/BSPP	1997-2012	0.0	0.0	0.0	0.0	na	0.0	0.0	0.0	0.0	na
BSP/BSPP	2013	0.0	**0.0**	0.0	**0.0**	3/	0.0	**0.0**	0.0	**0.0**	3/
	Total		**529.2**		**451.6**	**32%**		**978.4**		**809.8**	**83%**
Total Habitat Replacement Acres Applied											**1,261**

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

[3/] The majority of the 2007 though 2013 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 11 – McElmo Creek Unit Salinity Wildlife Funding NRCS On-Farm Programs

CRSCP/EQIP/ I-EQIP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1979 to 2012	$13,758,979
Funds Obligated to Salinity 2013	$416,663
Funds Obligated to Wildlife Projects 1979 to 2012	$180,451
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1979 to 2012	$148,305
Funds Spent on Wildlife Projects 2013	$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 1979 to 2013	1.3%
Percent of Total Salinity Funds Spent on Wildlife Projects 1979 to 2013	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 1997 to 2012	$3,385,883
Funds Obligated to Salinity 2013	$0
Funds Obligated to Wildlife Projects 1997 to 2012	$0
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1997 to 2012	$0
Funds Spent on Wildlife Projects 2013	$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 1997 to 2013	0.0%
Percent of Total Salinity Funds Spent on Wildlife Projects 1997 to 2013	0.0%

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

All Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1979 to 2012	$17,144,862
Funds Obligated to Salinity 2013	$416,663
Funds Obligated to Wildlife Projects 1979 to 2012	$180,451
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1979 to 2012	$148,305
Funds Spent on Wildlife Projects 2013	$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 1979 to 2013	1.0%
Percent of Total Salinity Funds Spent on Wildlife Projects 1979 to 2013	0.8%

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 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 habitat replacement projects in other salinity control units in western Colorado.

McElmo Creek Unit Wildlife Habitat Replacement Summary and Conclusions

The habitat replacement goal is 2% of the acres treated for salinity. To date **14,608 acres** have been treated with salinity control practices. To be concurrent with project application, **290 acres** of habitat replacement should currently be on the ground and functioning. To date **451 acres** of habitat replacement are reported as applied on the ground. The on-going field inventory and evaluation will assess the status of each reported habitat replacement project to assure the project is still being maintained and providing acceptable replacement habitat.

Pending the final determinations from the field inventory, the project is currently at approximately **155%** of the concurrent habitat replacement goals and potentially is at 105% for full project replacement goals. Urban development, changes in management and changes in land ownership are major reasons that some acres no longer met habitat replacement criteria and may need to be removed from the accounting system. In 2013, **5 new acres** of habitat replacement were planned and no new acres of wetland habitat were reported as applied.

NRCS is concurrent with McElmo Creek habitat replacement goals. To assure the current project status and to stay concurrent with salinity project implementation, NRCS will need to conduct 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 to assess the habitat project status, management, and operation and maintenance.

Mancos Valley Unit – Cortez Field Office - Wildlife Habitat Replacement

Based on project reporting the NRCS has reached approximately **50%** of the acreage treatment goal and approximately **36%** of the projected salinity reduction treatment goals. The goal for each project area is to be concurrent, meaning the habitat replacement should be adequate to meet the replacement values for the applied irrigation system improvements in place. The Mancos Valley Unit **exceeds** the concurrent wildlife habitat replacement goal by **83 acres** of wetland habitat.

Pending the results of the habitat inventory and evaluation the project area may have sufficient habitat replacement in place to exceed 100% of NRCS 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 habitat replacement goal will be approximately 140 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	2,695
Habitat Replacement Goal @ 2 acres per 100 acres Irrigation Treatment	54
Habitat Replacement Acres Applied and Maintained through FY 2012	137
Habitat Replacement Acres Applied During FY 2013	0
Total Habitat Replacement Acres Through FY 2013	137
Remaining Acres to Meet Concurrent Habitat Replacement Goal [2/]	83
Remaining Acres Needed to Meet Full Project Replacement Goal [3/]	29

Note the green boxes indicate extra or plus acres

[2/] Within the Mancos Valley project area there are 137 acres of wetland habitat reported through FY2013 and 582 acres of upland habitat reported. It is initially assumed all of the wetland acres should provide suitable replacement habitat, however it is unknown whether any of the upland habitat will meet suitable replacement requirements, so the upland acres are not included in the initial total. A preliminary field inventory and assessment was started during FY 2013. However, additional assessment will be needed to determine the actual habitat replacement acres still in place and suitable to meet salinity replacement habitat requirements. Additional work is currently being done to update the habitat inventory so the final field assessments can be conducted. The final inventory is scheduled to be completed during the spring and summer of FY 2014, and final adjustments to the habitat replacement numbers will be updated in the FY 2014 reports.

[3/] 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 habitat replacement needed, or the current habitat acres are sufficient to meet 127% of the full project replacement goal.

Pending the results of the wildlife habitat field assessments, the Mancos Valley Unit is **concurrent** with habitat replacement acres needed.

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

Program	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**	16.9	**16.9**	**87%**	467.6	**467.6**	396.1	**396.1**	**85%**
EQIP	2007-2012	235.5	235.5	120.0	120.0	1/	152.0	152.0	186.3	186.3	1/
	2013	0.0	**235.5**	0.0	**120.0**	1/	0.0	**152.0**	0.0	**186.3**	1/
BSP/BSPP	1997-2012	0.0	**0.0**	0.0	**0.0**	na	0.0	**0.0**	0.0	**0.0**	na
BSP/BSPP	2013	0.0	**0.0**	0.0	**0.0**	1/	0.0	**0.0**	0.0	**0.0**	1/
	Total		**255.0**		**136.9**	**54%**		**619.6**		**582.4**	**94%**
Total Habitat Replacement Acres Applied											**719.3**

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

1/ The majority of the 2007 though 2013 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 16 – Mancos Valley Unit Salinity Wildlife Funding NRCS On-Farm Programs

CRSCP/EQIP/ I-EQIP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1979 to 2012	$4,977,367
Funds Obligated to Salinity 2013	$105,047
Funds Obligated to Wildlife Projects 1979 to 2012	$287,629
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1979 to 2012	$179,569
Funds Spent on Wildlife Projects 2013	$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 1979 to 2013	5.7%
Percent of Total Salinity Funds Spent on Wildlife Projects 1979 to 2013	3.5%

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

BSP/BSPP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1997 to 2012	$472,575
Funds Obligated to Salinity 2013	$0
Funds Obligated to Wildlife Projects 1997 to 2012	$0
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1997 to 2012	$0
Funds Spent on Wildlife Projects 2013	$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 1997 to 2013	0.0%
Percent of Total Salinity Funds Spent on Wildlife Projects 1997 to 2013	0.0%

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

All Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1979 to 2012	$5,449,942
Funds Obligated to Salinity 2013	$105,047
Funds Obligated to Wildlife Projects 1979 to 2012	$287,629
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1979 to 2012	$179,569
Funds Spent on Wildlife Projects 2013	$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 1979 to 2013	5.2%
Percent of Total Salinity Funds Spent on Wildlife Projects 1979 to 2013	3.2%

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 habitat replacement projects in other salinity control units in western Colorado.

Mancos Valley Unit Wildlife Habitat Replacement Summary and Conclusions

The habitat replacement goal is 2% of the acres treated for salinity. To date **2,695 acres** have been treated with salinity control practices. To be concurrent with project application**, 54 acres** of habitat replacement should currently be on the ground and functioning. To date **137 acres** of wetland habitat replacement are reported as applied on the ground. The on-going field inventory and evaluation will assess the status of each reported habitat replacement project to assure the project is still being maintained and providing acceptable replacement habitat.

Pending the final determinations from the field inventory, the project is concurrent with habitat replacement goals and potentially is at 129% for full project replacement goals. Urban development, changes in management and changes in land ownership are major reasons that some acres no longer met habitat replacement criteria and may need to be removed from the accounting system. In 2013, no new acres of habitat replacement were planned and no new acres of habitat were reported as applied.

To assure the current project status and to stay concurrent with salinity project implementation, NRCS will need to conduct 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 assess the habitat project status, management, and operation and maintenance.

Silt Unit Wildlife Habitat Replacement

Based on project reporting the NRCS has reached approximately **54%** of the acreage treatment goal and approximately **54%** of the projected salinity reduction treatment goals. The goal for each project area is to be concurrent, meaning the habitat replacement should be adequate to meet the replacement values for the applied irrigation system improvements in place, or approximately **27 acres** of habitat replacement is needed to be concurrent. The Silt Unit currently reports **19.4** acres of replacement habitat applied or the Unit is about **8 acres short** of meeting the concurrent wildlife habitat goal and is potentially **31 acres** [2/] short of meeting the full project habitat replacement goals (see Table 19, page 79).

[/1] **Silt Salinity Control Project Plan and Environmental Assessment, USDA-NRCS, December 2005**

[/2] **Depending on how many irrigated acres are ultimately treated for salinity control, it is estimated that the final habitat replacement goal will be 10 acres of wetland and 40 acres of riparian/upland developed and or significantly enhanced.**

Silt Unit FY 2013 Wildlife Habitat Replacement Activities

In 2013 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 potentially provide suitable salinity 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 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 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	1,510
Habitat Replacement Goal /1	50
Habitat Replacement Acres Applied and Maintained through FY 2012	19
Habitat Replacement Acres Applied During FY 2013	0
Total Habitat Replacement Acres Through FY 2013	19
Remaining Acres to Meet Concurrent Habitat Replacement Goal 3/	8
Remaining Acres Needed to Meet Full Project Replacement Goal 4/	31

Note the rose boxes indicate negative or deficit acres

3/ The Silt 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".

4/ Assume a full project implementation at 2,800 acres of irrigation treatment, concurrent habitat replacement at (1,501 ac. /2,800 ac.) X 50 ac = 27 acres.

To date the Silt Unit is **8 acres below** the concurrent replacement 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 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	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	2007-2012	0.0	0.0	0.0	0.0	1/	19.4	19.4	19.4	19.4	1/
	2013	0.0	**0.0**	0.0	**0.0**	1/	0.0	**19.4**	0.0	**19.4**	1/
BSP/BSPP	2005-2012	0.0	0.0	0.0	0.0	na	0.0	0.0	0.0	0.0	na
BSP/BSPP	2013	0.0	**0.0**	0.0	**0.0**	1/	0.0	**0.0**	0.0	**0.0**	1/
	Total		**0.0**		**0.0**	#DIV/0!		**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 2007 though 2013 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 1979 to 2012	$1,135,550
Funds Obligated to Salinity 2013	$206,940
Funds Obligated to Wildlife Projects 1979 to 2012	$39,959
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1979 to 2012	$33,659
Funds Spent on Wildlife Projects 2013	$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 1979 to 2013	3.0%
Percent of Total Salinity Funds Spent on Wildlife Projects 1979 to 2013	2.5%

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

BSP/BSPP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1997 to 2012	$1,030,699
Funds Obligated to Salinity 2013	$0
Funds Obligated to Wildlife Projects 1997 to 2012	$0
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1997 to 2012	$0
Funds Spent on Wildlife Projects 2013	$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 1997 to 2013	0.0%
Percent of Total Salinity Funds Spent on Wildlife Projects 1997 to 2013	0.0%

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

All Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1979 to 2012	$2,166,249
Funds Obligated to Salinity 2013	$206,940
Funds Obligated to Wildlife Projects 1979 to 2012	$39,959
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1979 to 2012	$33,659
Funds Spent on Wildlife Projects 2013	$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 1979 to 2013	1.7%
Percent of Total Salinity Funds Spent on Wildlife Projects 1979 to 2013	1.4%

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 habitat replacement projects in other salinity control units in western Colorado.

Silt Unit Wildlife Habitat Replacement Summary and Conclusions

The habitat replacement goal for Silt Unit is **10 acres** of wetland habitat and **40 acres** of riparian/upland habitat. To date **1,639 acres** have been treated with salinity control practices. To be concurrent with project application, **27 acres** of habitat replacement should currently be on the ground and functioning. To date **19.4 acres** of riparian/upland habitat replacement are reported as applied on the ground.

Pending the final determinations from the field inventory, the project is currently below the concurrent 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 habitat replacement that may ultimately need to be removed from the accounting system. In 2013, no new acres of habitat replacement were planned and no new acres of habitat were reported as applied.

The NRCS will need to conduct 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 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 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 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.

Over the last 32 years 5 salinity programs have been utilized to replace wildlife acreage (Table 3, page 37). 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 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 2004, all wildlife contracts under EQIP are separate contracts and cancellation rates have decreased significantly.

During 2013, 3.8 acres of wildlife habitat replacement were applied (Table 25, page 85). Including FY 2013 the NRCS replacement effort has resulted in a net 390 acres of wildlife habitat applied and existing. The applied and existing acres account for about 25% of all planned 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 projects, 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 habitat replacement obligation. This 355 acre offset combined with NRCS funded projects has resulted in a total of 752 acres of wildlife habitat developed or significantly enhanced in the Grand Valley Unit.

Since 1991, a total of 48 acres of wetlands have been improved through salinity programs in the Grand Valley Unit with a net Avian Richness Evaluation Method (AREM)[1/] change of +26.49; however, these values do not reflect any additional wetlands lost due to irrigation impacts. In 2010, 1 wetland was created with 0 net AREM change. Wetlands created in 2009 and 2010 will be evaluated for AREM after 3 years to allow for vegetation to establish and wetland functions to develop.

Current expected habitat losses for the DeBeque Unit are a cumulative 3 acres and a change in AREM values of -0.17, and current expected habitat losses for the Whitewater Unit are cumulative 3 acres with no change in AREM values. There are 6 acres of habitat replacement included in the Grand Valley Unit total to offset these predicted losses.

[1/] Avian Richness Evaluation Method (AREM) developed by Paul Adamus under contract with the Environmental Protection Agency (EPA).

The current 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 **98%** of the acreage treatment goal at **41,989 acres** and approximately **107%** of the projected salinity reduction treatment goals in the Grand Valley Unit. To date **756 acres** of habitat have been applied and are being maintained. The Grand Valley Unit needs **1,206 acres** of habitat replacement to meet the concurrent and final habitat replacement goal, so the project area is still **450 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 assessment will be conducted in the Grand Valley Unit, but it is assumed follow-up assessments will end with the conclusion of the region wide Colorado River Salinity Control Program in western Colorado. The agency Salinity Program Managers should work with the Salinity Control Forum to develop a policy defining a recommended period of assessment and reporting after the conclusion of each Salinity Control Project.

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

Habitat Replacement	Acres
Salinity Program Irrigated Acres Treated to Date	42,581
Habitat Replacement Goal (GV @ 1,200 ac + WW&DB @ 6.0 ac) [1/]	1,206
Habitat Replacement Acres Applied and Maintained through FY 2012 [/2]	752
Habitat Replacement Acres Applied During FY 2013	4
Total Habitat Replacement Acres Through FY 2013	756
Remaining Acres to Meet Concurrent Habitat Replacement Goal [3/]	450
Remaining Acres Needed to Meet Full Project Replacement Goal [4/]	450

Note the rose colored boxes are negative or a deficit

[1/] Includes six (6) habitat replacement acres for the Whitewater(WW) and DeBeque(DB) areas, added to the Grand Valley Unit's 1,200 acre number, based on a site visit to each individual project to calculate the expected habitat losses.

[2/] Includes 355 acres of habitat replacement supplied by the USDI- USBR to cover a portion of the NRCS habitat losses from the on-farm irrigation system improvements per inter-agency agreement.

[3/] Assume a full project implementation at 42,000 acres of irrigation treatment plus WW and DB at 6 acres. FY 2013 Concurrent habitat replacement is at 1,206 ac.

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

As displayed in Table 24, the Grand Valley Unit is currently **450 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 **198 acres** of habitat enhancement under contract, and there is one large project with the planning completed and the funding contract signed November 2013 on an additional **490 acres** of habitat improvement. If all of these funded projects are installed as planned, the Grand Valley Unit will exceed the full 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	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**	30.0	**30.0**	**27%**	892.2	**892.2**	147.3	**147.3**	**17%**
IEQIP/EQIP	1996 - 2006	56.7	**56.7**	18.8	**18.8**	**33%**	253.1	**253.1**	92.3	**92.3**	**36%**
EQIP	2007-2012	0.0	0.0	0.0	0.0	1/	131.6	131.6	20.5	20.5	1/
	2013	0.0	**0.0**	0.0	**0.0**	1/	8.7	**140.3**	3.8	**24.3**	1/
BSP/BSPP	1997-2012	36.3	36.3	15.7	15.7	**43%**	253.8	**253.8**	72.3	72.3	**28%**
BSP/BSPP	2013	0.0	**36.3**	0.0	**15.7**	1/	0.0	**253.8**	0.0	**72.3**	1/
	Total		**204.4**		**64.4**	**32%**		**1,539.4**		**336.2**	**22%**
Total Habitat Replacement Acres Applied											**400.7**

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

1/ The majority of the 2007 though 2013 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 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 1979 to 2012	$36,189,686
Funds Obligated to Salinity 2013	$637,337
Funds Obligated to Wildlife Projects 1979 to 2012	$2,697,003
Funds Obligated to Wildlife Projects 2013	$38,277
Funds Spent on Wildlife Projects 1979 to 2012	$855,056
Funds Spent on Wildlife Projects 2013	$52,946
Percent of Total Salinity Funds Obligated to Wildlife Projects 1979 to 2013	7.4%
Percent of Total Salinity Funds Spent on Wildlife Projects 1979 to 2013	2.5%

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 1997 to 2012	$2,659,788
Funds Obligated to Salinity 2013	$407,592
Funds Obligated to Wildlife Projects 1997 to 2012	$638,395
Funds Obligated to Wildlife Projects 2013	$0
Funds Spent on Wildlife Projects 1997 to 2012	$178,040
Funds Spent on Wildlife Projects 2013	$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 1997 to 2013	20.8%
Percent of Total Salinity Funds Spent on Wildlife Projects 1997 to 2013	5.8%

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

All Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 1979 to 2012	$38,849,474
Funds Obligated to Salinity 2013	$1,044,929
Funds Obligated to Wildlife Projects 1979 to 2012	$3,335,398
Funds Obligated to Wildlife Projects 2013	$38,277
Funds Spent on Wildlife Projects 1979 to 2012	$1,033,096
Funds Spent on Wildlife Projects 2013	$52,946
Percent of Total Salinity Funds Obligated to Wildlife Projects 1979 to 2013	8.5%
Percent of Total Salinity Funds Spent on Wildlife Projects 1979 to 2013	2.7%

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 unfortunate trend was part of what necessitated the changes in how projects approached the habitat replacement agreements under salinity control. The rates of obligated versus expended funds for wildlife have been improving significantly with this new 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 $38,277 was obligated to wildlife projects in FY 2013.

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 once a funding agreement is finalized. Through FY 2013 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.

Guaranteed 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 2007 the NRCS Biologist field checked all acres that had been reported as habitat replacement. The inventory resulted in a reduction of acres considered habitat replacement from **776 acres in 2006**, to **684 acres in 2007**. All projects are monitored every three years to ensure they continue to meet the habitat replacement goals. Prior to 2013 all projects were monitored the same year. Beginning in 2013, 1/3 of the total projects will be monitored every 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 and 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 habitat replacement criteria and were removed from the accounting system.

As previously stated, the combined habitat replacement goal for the Grand Valley Unit is **1,206 acres**. To date **41,989 acres** have been treated with irrigation improvement practices, or **98%** of the total adjusted acreage treatment goal, and **107%** of the salinity reduction goal has been met. To be concurrent with project application, **1,206 acres** of habitat replacement should currently be on the ground and functioning. To date **746 acres** of habitat replacement are applied on the ground and provide replacement habitat. The project is currently at **62%** of the concurrent habitat replacement goals, however additional habitat replacement acres are currently in active contracts and if installed as planned they will provides enough additional acres to exceed the full project replacement goals.

To be concurrent with salinity project implementation and to replace additional habitat replacement acres lost during the life of the program, the NRCS will need to continue to place high priority on habitat replacement.