

# **Monitoring and Evaluation Report Silt Unit**

**Colorado River Salinity Control Project  
2012**

**USDA-NRCS  
Glenwood Springs, Colorado**



## **IWM MONITORING & EVALUATION REPORT**

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## **WILDLIFE MONITORING & EVALUATION**

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## EXECUTIVE SUMMARY

### SILT UNIT

### 2012

#### Hydro-Salinity -

- ◆ The project plan is to treat approximately **2,800 acres** with improved irrigation systems.
- ◆ To date **1,501 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 2012, salt loading has been reduced an additional **32 tons/year** as a result of installed salinity reduction practices.
- ◆ The cumulative salt load reduction is **2,139 tons/year**, or 54 percent of the project goal.

#### Cost Effectiveness -

- ◆ The planned cost per ton of salt saved with FY 2012 contracts (one year) is **\$261.19 /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 2012 = 0.0668

TA = technical assistance cost: (FA x 0.67)

#### 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 39% of the original cumulative wildlife habitat 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.
- ◆ Estimated of losses to date are: Wetlands – 0 acres; Riparian/Ditches – 15.7 acres
- ◆ Replacement efforts to date have yielded one habitat replacement contract

## Key Considerations and Conclusions –

- ◆ In 2012 participation in the Silt Salinity Unit increased from 2011, however contracted acres are still fairly low. Given the relatively low level of acres in 2012, additional follow-up should be conducted to assess whether the 2,800 acre treatment goal is still needed or achievable.
- ◆ 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.
- ◆ The Bookcliff Conservation District and NRCS are holding a meeting in 2013 to evaluate participant interest and treatment needs within the Silt Salinity Unit. Land owner interest in developing wildlife habitat contracts will also be evaluated at this meeting.
- ◆ 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 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.

# **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.

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 marine shale

formations, 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. 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.

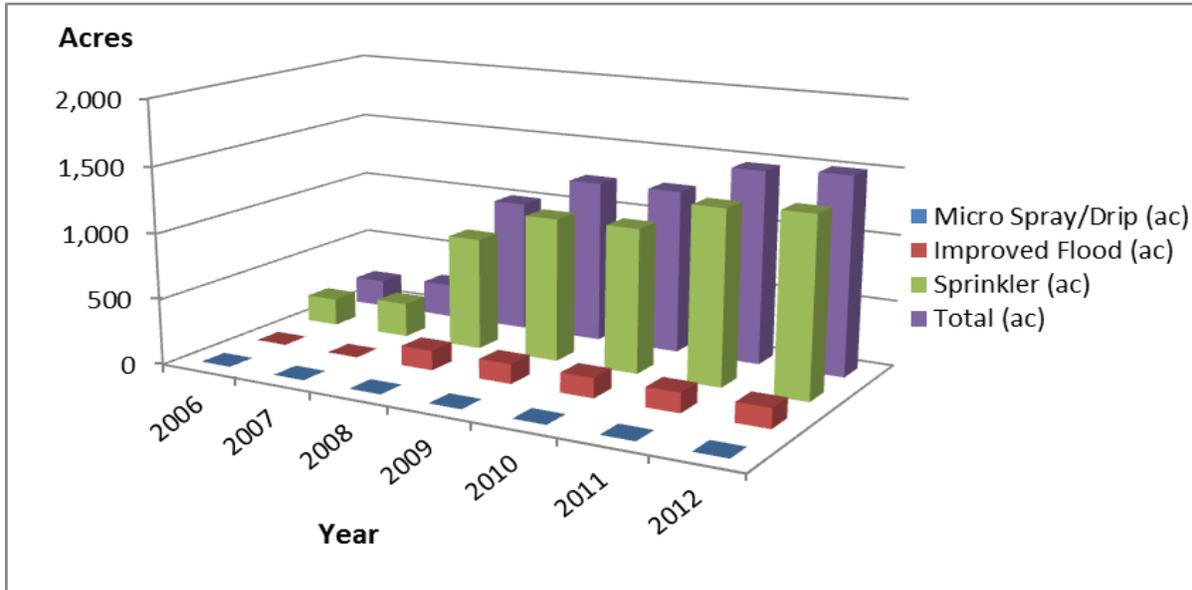
Areas with a greater conversion to sprinkler or micro spray will be at the 15 inch reduction and areas with predominantly flood irrigation will be at the 10 inch reduction. Areas that are converting from unimproved flood systems will have deep percolation plus seepage reductions in the 25 to 30 inch 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.

**Graph 1 – Silt Unit Cumulative Irrigation Systems Installed**



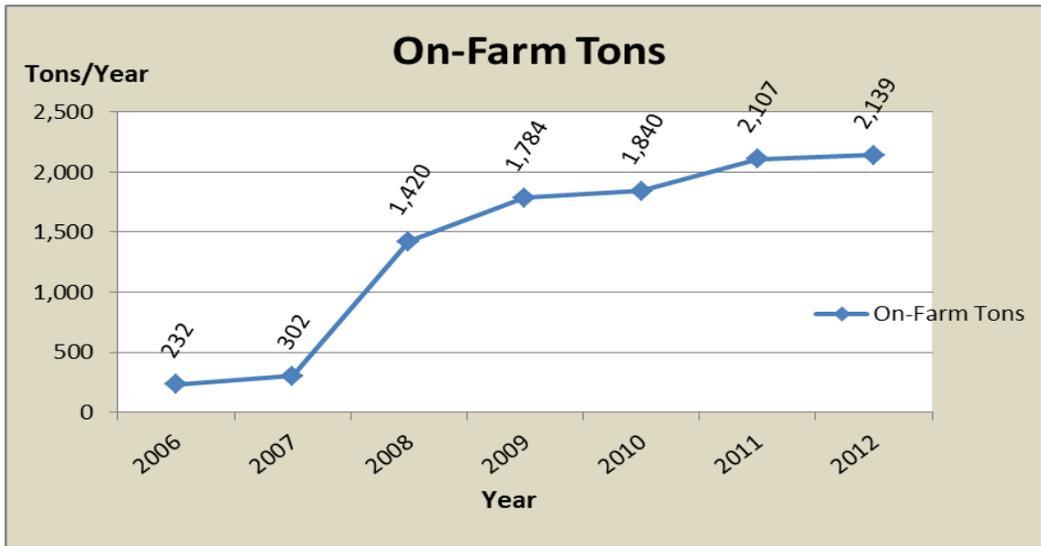
IRRIGATION SYSTEMS APPLIED (acres)	FY2012	CUMULATIVE
Sprinkler	34	1,351
Improved Surface System	0	150
Micro-Spray/ Drip System	0	0
<b>TOTAL</b>	<b>34</b>	<b>1,501</b>

Graph 1 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.

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 – Silt Unit Cumulative On-Farm Salinity Load Reduced**



**Table 2 - USGS Trend Analysis and Agency Reported Salinity Reduction**

Unit	Trend Years	NRCS Project Start Year	NRCS Reported Reduction (tons/year) <sup>/1</sup>	BOR Reported Reduction (tons/year) <sup>/1</sup>	Total Predicted Reduction (tons/year) <sup>/1</sup>	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 <sup>/2</sup>	38,438

<sup>/1</sup> The ton/year number is the cumulative salt load reduction reported for the final trend analysis year for each study, either 2003 or 2006

<sup>/2</sup> 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.

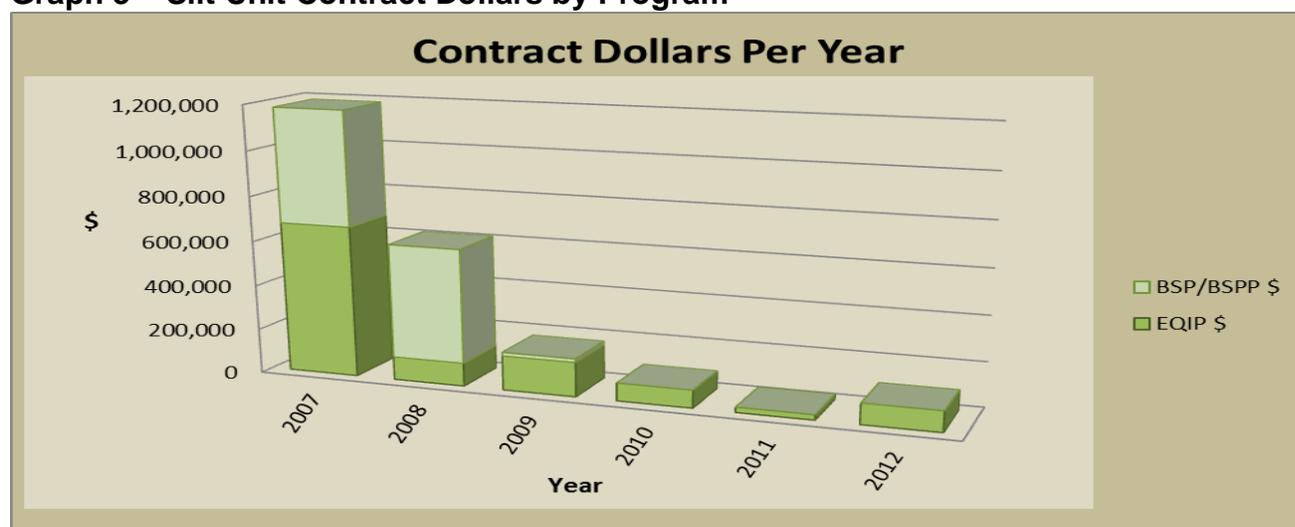
**Table 2 References**

“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.

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

**Graph 3 – 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 3 displays the Environmental Quality Incentive Program (EQIP) and Basin States Program (BSP/BSPP) contract dollars per year from 1999 through 2012. 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 was 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. were paid by the landowner and were 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. 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 estimated number of contracts was down by about two thirds during this period as a result of the recession. 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 is assumed the amount of both EQIP and BSP contracts will continue to increase<sup>1</sup> as the local economy improves.

<sup>1</sup> 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 how the changes to payment schedule might affect the rate of sign-up and participation for the 2013 FY.

**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

The trend in the Silt Unit 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 through the economic turnover in the area from the public cost-share funds, the improved crop qualities, agricultural sustainability, etc.

## **2012 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 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 year former Basin States Parallel Program (BSPP) is transitioning to the new 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.

In FY 2012 NRCS and the Bookcliff Conservation District had 6 new contracts covering 39 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 2012 NRCS and the Bookcliff Conservation District worked with 13 existing contracts covering 164 acres on their IWM follow-up and practice certification. During the 2012 irrigation season 2 can tests were conducted on pivot irrigation systems to verify nozzle application rates.

### **FY 2012 Salinity Outreach activities include:**

- January 2012 – “Ag Day” all producers invited from the Book Cliff/Mt Sopris/Southside Conservation Districts at the Silt Fire Station. Outreach and education provided to all producers about the resource concerns, how do deal with them and potential funding, including BSP and EQIP (General Program and Silt Salinity Control Program), 106 participants.

### **Future Irrigation Water Management (IWM) Goals & Recommendations & Tasks**

Completed irrigation schedule 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 2013 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.

### **Project Area Future Outlook**

Applications for 2013 within the Silt Salinity Unit are low again with only 4 new applications. However, the acres covered by these contracts are greater than the 2012 contracts, due to a larger size fields and greater treatment acres per contract, assuming final funding is approved. 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 Bookcliff Conservation District and NRCS will be hosting meetings within the Silt Salinity Unit to get feedback on the program activities and to gauge future participant interest.

# Wildlife Monitoring and Evaluation

## History

Salinity control work by the Natural Resources Conservation Service (NRCS) in the Silt Unit is through the Environmental Quality Incentives Program (EQIP) which includes matching funds from the Bureau of Reclamation delivered through the Basin States Program (BSP/BSPP).

The wildlife habitat replacement activities during the initial salinity program implementation in the original project areas were based on a process that specified the **“replacement of wildlife values foregone” and impacts to wildlife will be accounted for 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 represents cottonwood-willow and other woody habitat associated with irrigation ditches and tail water. Mallard breeding habitat represents shallow wetlands and nesting habitat surrounding these wetlands. Mallard –winter habitat represents winter roosting areas (large water bodies and ice free water) and management of crop residues. Meadow vole represents sedge- rush wet meadows often associated with leaky ditches and inefficient irrigation. Marsh wren represents cattail- bulrush (robust emergent) wetlands and the screech owl is associated with groups of large deciduous trees. The models are custom models that underwent peer review and were developed explicitly for this project with the assistance of USFWS. Changes in wetland values are supposed to be tracked using the Avian Richness Evaluation Method (AREM) developed by Paul Adamus under contract with the Environmental Protection Agency (EPA). Refer to the 1994 Monitoring and Evaluation Plan for the Lower Gunnison Unit for details on monitoring methods used under the Colorado River Salinity Control Program.

## Adjustments

It was determined the 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 the irrigation improvements for salinity control. However, continuing the use of 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 looked to accomplish all of the replacement goals within the project areas and attempted to get cooperation with the replacement projects from each participating landowner. This approach created a scattering of small and disconnected projects and often poorly managed projects that were not really supplying either the quality or quantity of habitat necessary to meet program goals.

The NRCS and USFWS entered into discussions and developed 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 the existing water tables to assure the wetland project 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 project was within a reasonable proximity of a salinity project area, and the type of habitats supplied met similar habitat types to the ones affected by the salinity control irrigation improvements.

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

The change to the 2 acre per 100 acre rate 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<sup>1/</sup>, the US Fish and Wildlife Service reviewed the biological evaluation and concurred with the established replacement goals. It is unknown what the replacement needs will be if the project treats more or less than the estimated irrigation treatment acres.

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 sort of meeting the concurrent wildlife habitat goal and is potentially 31 acres<sup>2/</sup> short of meeting the full project habitat replacement goals.

A key issue with the U.S. Fish and Wildlife Service is that credited replacement acres must be on the ground and functioning as effective habitat when the salinity project is complete. Some loss of wildlife habitat will take place as operation and maintenance agreements expire and land uses change in the Silt Unit. To account for the loss, it is likely NRCS will need to apply more habitat replacement acres than the goaled amount. NRCS biologists will visit all habitat replacement projects every 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.

<sup>1/</sup> Silt Salinity Control Project Plan and Environmental Assessment, USDA-NRCS, December 2005

<sup>2/</sup> 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.

**Table 4 – Wildlife Habitat Replacement Table – Silt Unit**

<b>Habitat Replacement</b>	<b>Acres</b>
Salinity Program Irrigated Acres Treated to Date	1,501
Habitat Replacement Goal <sup>/1</sup>	50
Habitat Replacement Acres Applied and Maintained through FY 2011	19
Habitat Replacement Acres Applied During FY 2012	0
Total Habitat Replacement Acres Through FY 2012	19
Remaining Acres to Meet Concurrent Habitat Replacement Goal <sup>/2</sup>	8
Remaining Acres Needed to Meet Full Project Replacement Goal	31

Note the rose boxes indicate negative or deficit acres

<sup>1/</sup> 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”.

<sup>2/</sup> 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.

### **Silt Unit FY 2012 Wildlife Habitat Replacement Status**

In 2012 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 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 5 – Wildlife Habitat Planned and Applied with Funded Contracts – Silt Unit**

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 (%)
EQIP	2005 - 2006	0.0	<b>0.0</b>	0.0	<b>0.0</b>	na	0.0	<b>0.0</b>	0.0	<b>0.0</b>	na
EQIP	2007	0.0	0.0	0.0	0.0	1/	0.0	0.0	0.0	0.0	1/
	2008	0.0	0.0	0.0	0.0	1/	19.4	19.4	2.5	2.5	1/
	2009	0.0	0.0	0.0	0.0	1/	0.0	19.4	3.4	5.9	1/
	2010	0.0	0.0	0.0	0.0	1/	0.0	19.4	0.0	5.9	1/
	2011	0.0	0.0	0.0	0.0	1/	0.0	19.4	13.5	19.4	1/
	2012 <sup>2/</sup>	0.0	<b>0.0</b>	0.0	<b>0.0</b>	1/	0.0	<b>19.4</b>	0.0	<b>19.4</b>	1/
BSP/BSPP	2005-2011	0.0	<b>0.0</b>	0.0	<b>0.0</b>	na	0.0	<b>0.0</b>	0.0	<b>0.0</b>	na
BSP/BSPP	2012 <sup>2/</sup>	0.0	0.0	0.0	0.0	1/	0.0	0.0	0.0	0.0	1/
<b>Total</b>			<b>0.0</b>		<b>0.0</b>			<b>19.4</b>		<b>19.4</b>	<b>100%</b>
<b>Total Habitat Replacement Acres Applied</b>											<b>19.4</b>

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

<sup>1/</sup> The majority of the 2007 through 2012 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.

<sup>2/</sup> The Glenwood Springs Field Office reports the applied habitat acres on the row for the year it was certified as fully implemented and not for the year each project was planned.

**Table 6 – Salinity Wildlife Funding NRCS On-Farm Programs – Silt Unit**

EQIP Salinity Wildlife Funding	Amount
Funds Obligated to Salinity 2007 to 2011	\$1,035,766
Funds Obligated to Salinity 2012	\$99,784
Funds Obligated to Wildlife Projects 2007 to 2011	\$39,959
Funds Obligated to Wildlife Projects 2012	\$0
Funds Spent on Wildlife Projects 2007 to 2011	\$33,659
Funds Spent on Wildlife Projects 2012	\$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 2007 to 2012	3.5%
Percent of Total Salinity Funds Spent on Wildlife Projects 2007 to 2012	3.0%

**Table 7 – Salinity Wildlife Funding BSP/BSPP On-Farm Programs – Silt Unit**

<b>BSP/BSPP Salinity Wildlife Funding</b>	<b>Amount</b>
Funds Obligated to Salinity 2007 to 2011	\$1,030,699
Funds Obligated to Salinity 2012	\$0
Funds Obligated to Wildlife Projects 2007 to 2011	\$0
Funds Obligated to Wildlife Projects 2012	\$0
Funds Spent on Wildlife Projects 2007 to 2011	\$0
Funds Spent on Wildlife Projects 2012	\$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 2007 to 2012	0.0%
Percent of Total Salinity Funds Spent on Wildlife Projects 2007 to 2012	0.0%

**Table 8 – Salinity Wildlife Funding All On-Farm Programs – Silt Unit**

<b>All Salinity Wildlife Funding</b>	<b>Amount</b>
Funds Obligated to Salinity 2007 to 2011	\$2,066,465
Funds Obligated to Salinity 2012	\$99,784
Funds Obligated to Wildlife Projects 2007 to 2011	\$39,959
Funds Obligated to Wildlife Projects 2012	\$0
Funds Spent on Wildlife Projects 2007 to 2011	\$33,659
Funds Spent on Wildlife Projects 2012	\$0
Percent of Total Salinity Funds Obligated to Wildlife Projects 2007 to 2012	1.8%
Percent of Total Salinity Funds Spent on Wildlife Projects 2007 to 2012	1.6%

## 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.

## **Wildlife Habitat Replacement Discussion and Conclusion**

The habitat replacement goal for Silt Unit is 10 acres of wetland habitat and 40 acres of riparian/upland habitat. To date 1,501 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 2012, 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 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.