Final Report December 2009 Stewart Meadows Wetlands Waterfowl Habitat Improvement Partnership Project Assistance Agreement No. CD-976389-01-0 (FY2003)



Stewart Meadows

Project Description and Location

The Stewart Meadows Wetlands Waterfowl Habitat Improvement Partnership Project was developed with the goal of creating and improving wetland habitat for migratory waterfowl. It is located on the Rio San Antonio near Los Pinos, Rio Arriba County (Section 8, Township 30 North, Range 8 East) in the Rio de los Pinos/Rio San Antonio Watershed (HUC 13010005) (see attached map). The Rio San Antonio, a tributary to the Rio de los Pinos is within the Upper Rio Grande Unified Watershed Assessment Category One Watershed. Designated uses and water quality standards for the Rio San Antonio are listed in the State of New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4.123 NMAC). The Rio San Antonio was sampled for water quality in 2000 by the New Mexico Environment Department, Surface Water Quality Bureau (SWQB). Sampling results indicated full support for stream bottom deposits, but impacts have been observed. Thermographs were deployed in the Rio San Antonio in 2002 and 2003. The Rio San Antonio (Montoya Canyon to headwaters segment) was listed for temperature on New Mexico's 2004-2006 CWA Section 303(d) list of impaired stream reaches. A TMDL has subsequently been developed for the Rio San Antonio for temperature.

exceedences have been attributed to riparian grazing, flow regulation/modification, removal of riparian vegetation, and streambank modification and destabilization.

Stewart Meadows was acquired by the CNF with Land and Water Conservation Funds in 1973. Associated with the land acquisition are approximately 190 acre-feet of water rights. All property immediately adjoining the project area is National Forest System lands. The project is located within the historic floodplain of the Rio San Antonio. The previous owners drained and leveled the land for irrigated agriculture to grow hay for their ranching operation. The nearly flat terrain and irrigation ditches presented an ideal opportunity for the development of shallow water wetlands for waterfowl migration, feeding and breeding habitat.



Project Location

Project Goals and Objectives

The goal of this project is to develop, improve and protect waterfowl habitat at Stewart Meadows which is within the Southern Mountain Bird Conservation Region. The original goal of this project was to construct an impoundment dike to create a 25-acre pond for waterfowl. However after review of the project area with waterfowl habitat specialists like (the Late) John Taylor (USFWS) Bosque del Apache Wildlife Refuge Manager and Dr. Leigh Frederickson (Univ. of Missouri, Wetlands Ecologist, Gaylord Laboratory Director), the goals of this project were reformulated to develop moist soil habitat within 300 available acres of the 350 total acres of the project site. The idea was that a critical need of migrating waterfowl is resting habitat during migration and a source of protein in their diet. Moist soil supports the macroinvertebrate and plant community that provides the correct protein for waterfowl dietary needs.



Stewart Meadows – Waterfowl using wetland habitat, September 2009

The Stewart Meadows Wetlands Waterfowl Habitat Improvement Partnership Project is part of a larger effort in the Southern Mountain Bird Conservation Region to develop, improve, and protect a system of wetland habitats on the Tres Piedras Ranger District of the Carson National Forest. These wetlands include Lucero Lakes and Ursula Lake (ephemeral wet meadows and marshes), Laguna Larga and associated wetlands (lakes and ephemeral wetlands). Stewart Meadows lies less than forty miles from the Monte Vista National Wildlife Refuge that was created to enhance the survival and productivity of waterfowl within the Rio Grande valley. Although the National Refuge provides protection for an important series of wetland habitats, there are potential disease hazards associated with relatively large concentrations of waterfowl. The development of a widely distributed system of wetland habitats effectively disperses waterfowl over a larger area, resulting in healthier waterfowl, shorebird and passerine populations, as well as decreased predation and improved nesting success.



Potentilla and Water Smartweed (Persicaria amphibian) Stewart Meadows

This project was also expected to add to the diversity of the floodplain by restoring historic wetlands and creating feeding and nesting habitat within areas that were formerly irrigated pasture. Implementing this wetland restoration effort allows ample wetland plant growth and most importantly good growth of aquatic insects improving waterfowl foraging habitat and overall diversity. Within the project area five acres of Southwestern Willow Flycatcher Habitat is present and this project was expected to enhance the efficacy of this habitat as well.

Other project goals included outreach to local schools. Stewart Meadows is located in a very sparsely populated part of the state surrounded by public land. The objective was to have students from local communities learn about wetland ecology and help with restoration measures so that they can become more connected with the region and the landscape that they call their home. SWQB and CNF staff helped coordinate adult and student volunteers recruited from environmental and conservation groups and surrounding communities to help with project activities. SWQB also targeted local high schools in Taos, Taos Pueblo, Ojo Caliente, Tres Piedras, Questa and other New Mexico communities to participate as an educational activity and community service.



Delbert Trujillo (SWQB) oversees planting by students from Alta Vista School (Questa, NM)

Educational and demonstration days and a Summer Academy were organized for local school children and conducted at the schools and at the Stewart Meadows site. All these outreach measures were expected to expand the public's knowledge and respect for wetlands and wildlife habitat, and also to help participants form lifelong bonds with places such as these that will guarantee future protection of wetlands resources.



Students learning about macroinvertebrates at Stewart Meadows Stewart Meadows Final Report December 2009



Wetlands Presentation by Sarah Holcomb at Mesa Vista High School, April 2005.

A value added feature of this project (but not one of the original goals) was the development of the Conejos Watershed Wetlands Action Plan. The Wetlands Action Plan is a planning document that addresses wetlands, riparian areas and buffer as an additional component of a Watershed Restoration Action Strategy. A Wetlands Action Plan assesses local wetlands/riparian resources within the boundaries of a specific watershed to help watershed groups to develop individual implementable plans and projects for wetland protection, restoration, enhancement and mitigation. The Rio San Antonio and Rio de los Pinos Watersheds (Conejos) Wetlands Action Plan includes chapters on Geographical Location, Soil Features and Geology, Ecological and Biological Diversity, Wetlands Inventory, Land Use, Land Cover, Threats and Impairments, Rational for Restoration and Potential Projects. A number of meetings and field reviews were held with stakeholders to develop and obtain buy-in for the Conejos Wetlands Action Plan.



Stewart Meadows Final Report December 2009

Original Timeframe

A timeline was created for the Stewart Meadows Project that began in early 2004 and was to be completed by December of 2006.

Cooperators involved

The Carson National Forest was the principal partner in this project and the Taos Field Office and Tres Piedras Ranger District were involved with SWQB Wetlands Program in every aspect of project completion.

Other project partners included:

Albuquerque Wildlife Federation – volunteer help with wetland restoration

Alta Vista Middle School, Questa, NM – school field days and riparian planting at Stewart Meadows

Dr. Leigh Fredrickson, Univ. Missouri - pro-bono consultant for the Stewart Meadows Master Plan Los Lunas Plant Materials Center- match donation and contract supplier of riparian plants

Jim McGrath, Botanist – contract botanist and voluntary outreach to school children, Native Plant Society and volunteers about the botany of Stewart Meadows

Meridian Institute – lead contractor on the development of the Conejos Watershed Wetlands Action Plan

- Mesa Vista High School, Ojo Caliente, NM school field days and riparian planting at Stewart Meadows
- Rangeland Hands, Inc contractor for design and construction of Stewart Meadows restoration and volunteer coordinator for volunteer restoration weekend.

(The Late) John Taylor USFWS – pro-bono consultant for the Stewart Meadows Master Plan

Tio Grande Grazing Association – participant in the Conejos Wetlands Action Plan development

- Stream Dynamics, Inc. sub-contractor for design and construction of Stewart Meadows restoration
- WERC volunteer lead for the Summer Academy and provided match from Teachers and Student participation
- Zeedyk Consulting, Inc sub-contractor for design and construction of Stewart Meadows restoration and volunteer designer and implementation guidance for wetland restoration volunteer weekend
- A number of other participants helped with the development of the Conejos Wetlands Action Plan including representatives of Hawks Aloft, BLM, NMDGF, Wild Turkey Federation, Hydra, Inc. and local residents.

Funding

The original Federal amount was \$100, 000 under the Contractual category which was spent and \$33,750 match. The **final match amount** was **\$94,054.09 (\$60,304.09 overmatched).** See quarterly and semi-annual reports for details.



Summer Academy 2006

Major Project Highlights

- A Joint Powers Agreement between NMED and Carson National Forest was completed on April 4, 2004.
- The Conejos Watershed Group was formed in May 2005.
- The Stewart Meadows Master Plan was completed in December 2005.
 - Highlights of the plan include:
 - Improve ditch system so that water can be diverted to the whole area, not just the impoundment.
 - Create shallow connected potholes to help water move around and wet the whole area. Potholes would also improve forage areas for waterfowl and allow standing water further into the summer season.
 - Raising culvert inlets along FS 87 to prevent sediment from flowing into the wetlands.
 - Construct structures in arroyos to the south of the wetlands in order to trap runoff and allow sediment to settle.
 - Restore existing nesting islands.
 - Develop a parking area and trail system for recreational and educational purposes.
 - Build a bird blind on the trail system.
 - Restore riparian areas, for instance by planting willows, cottonwoods, etc. to improve wildlife habitat and fisheries.

The original plan would create a 25 acre pond. The new Stewart Meadows Master Plan will restore 300 acres of moist soil habitat. This increases the total wetland area restored by 275 more acres than originally planned.

- Outreach to students was conducted in 2004, 2005 and 2006.
- The bird and botanical surveys were completed in 2006.
- The Summer Academy was held during the summer of 2006.
- The Conejos Wetlands Action Plan was completed in February 2007.
- Internal fences were removed and the high water fence was completed in 2007.
- The final Design for the construction was completed in May 2008
- The construction of Stewart Meadows restoration was completed in May 2009 by Rangeland Hands, Inc.
- A three-day work weekend was conducted to complete Arroyo #4 restoration in September 2009.
- This Final Report was submitted on December 10, 2009.

TEAM UP FOR WILDLIFE PROJECT



Project Chronology

- Signatures on the Cooperative Agreement between NMED and EPA were completed on September 26, 2003 which commenced Stewart Meadows work.
- Four high schools in the region selected for participation in wetlands restoration activities and fieldtrips were contacted by March 2004.
- A Joint Powers Agreement between NMED and Carson National Forest was completed on April 4, 2004.
- A Stewart Meadows site visit with John Taylor of Bosque del Apache National Wildlife Refuge and Dr. Leigh Fredrickson of Gaylord Laboratory conducted on June 21, 2004 to begin work on a Stewart Meadows Master Plan. At this meeting, the Phase 2 large 25-acre pond idea was abandoned and the replaced with the development of shallow marsh habitat over 300 acres.
- A Town Hall meeting was conducted on December 6, 2004 at the Tres Piedras Ranger District to receive input for the Stewart Meadows Master Plan from additional local wetland experts and biologists and other interested stakeholders. In addition, discussion about the development of a watershed group and a Conejos Watershed Wetlands Action Plan was initiated. Meridian Institute facilitated the meeting.

- The idea of including a Summer Academy as part of the outreach to schools was discussed at the Town Hall.
- Sarah Holcomb, SWQB Intern, coordinated educational demonstration days with local schools. Three school presentations were conducted in May, 2005 by Sarah and Maryann McGraw, Wetlands Program Coordinator.
- Three education day field trips for students were also conducted in May 2005 where students spent the day participating in wetlands activities. Over 150 students participated in the three outdoor events.
- The first draft of the Stewart Meadows Master Plan was completed by CNF Engineer, Gerardo Chavarrio.
- The Conejos Watershed Group was formed in May 2005.
- Maryann McGraw presents the progress of the Stewart Meadows project at the Western Wetlands Conference in Denver on October 25, 2005.
- A watershed group meeting was held December 13, 2005 to present the Stewart Meadows Master Plan. Participants included wetlands professionals, permittees, private landowners, state and federal agency representatives, teachers from local schools and representatives of WERC to talk about the upcoming Summer Academy.
- Maryann McGraw (Wetlands Program Coordinator) and Chirre Keckler (FS Biologist) develop a FS Project Work Plan to hire subcontractors to complete work at Stewart Meadows except for the trail work and bird blind which will be completed with other funding sources.
- An amended JPA and Project Workplan was completed in March 2006 to include the new Master Plan and Summer Acadamy and to extend the project until June 2007.
- A bird survey and botanical survey were completed in 2006.
- A student volunteer workday was conducted in April 2006. Mesa Vista Students planted donated wetland shrubs in the Stewart Meadow project area.
- A Statement of Work for Design and Construction was developed by Maryann McGraw (WPC).
- The Summer Academy that focused on wetlands for New Mexico High School Students and their teachers was held July 16-21, 2006. The Students spent part of their time at Stewart Meadows. Additional plantings of wetland shrubs was completed by the Summer Academy.
- Adleaido Romero (CNF) removes internal fences at Stewart Meadows during summer 2006..
- A draft Conejos Wetlands Action Plan is completed by Maria Milanes-Murcia (SWQB Intern) with input from Stakeholders and the Conejos Watershed Group. The draft is presented to the Watershed Group in February 2007. This is a value added feature of this project.
- An amendment to the Stewart Meadows grant to extend the grant until December 2008 was approved in April 2007.
- A Statement of Work for the Design and Construction was completed by CNF personnel in August 2007.
- Maria Milanes- Murcia presents the Conejos Wetlands Action Plan at the Colorado/New Mexico Border Wetlands meeting in Alamos Colorado in October 2007.
- The removal of internal fences and the construction of the high water fence are completed in 2007.
- Maryann McGraw presents an update of Stewart Meadows activities at the USFS/NMED Annual Meeting.
- A design contract is awarded to Rangeland Hands, Inc to complete the final design for Stewart Meadows Construction. The design was completed in May 2008.
- A Request for Proposals for Construction was let August 2008. Three bids were received.
- A botanical presentation to the Native Plant Society and follow up nature walk at Stewart Meadows were conducted in September 2008.

- A final contractor was selected in October, however it snowed in October and the contractor did not want to work until the spring for fear that his equipment would be stuck for the rest of the winter. The construction was post-poned until May 2009.
- The JPA and Grant were extended until September 2009 to complete the construction, volunteer days and the final reimbursement and reports.
- An application for a joint CWA Section 404/401 permit for the restoration construction at Stewart Meadows was approved on April 19, 2009 (404) and April 23, 2009 (401).
- The Construction at Stewart Meadows was completed in May 2009.
- A three -day work weekend was conducted in September, 2009.
- Plaques commending the USFS participation were awarded at the 2009 USFS/NMED annual meeting. Maryann McGraw also made a presentation about the project at that meeting.
- The final report was forwarded to EPA on December 10, 2009.



Stewart Meadows Master Plan Engineering Design

List of Major Deliverables:

Stewart Meadows Master Plan Conejos Wetlands Action Plan Bird Survey Botanical Survey Statement of Work for Design and Construction Final Design Final construction report and photos Stewart Meadows Operation Plan Power point presentations Semi-Annual and Final Reports, Match reporting Permits and Clearances



Plant Community Map of Stewart Meadows (227 plant species identified)

Lessons Learned

What made the project successful?

This project is exceptionally successful for producing outcomes above and beyond the original expectations when the project was first conceived.

- 1) The original plan was to construct a 25 acre pond for waterfowl. The final design which includes approximately 300 acres of diverse moist soil foraging habitat complements the already existing pond at the Stewart Meadows site creating a diversity of habitat for waterfowl and other wildlife species to utilize. The final construction included the removal of internal fences that created barriers and for wildlife; the installation of a high water fence to keep cattle out of the project area; creation of 30 small wetland depressions that improved macro-topographic complexity and microhabitats; improvement of the delivery system of water to the Rio San Antonio floodplain which will also improves infiltration along the floodplain; plantings along the Rio San Antonio banks which will help bank stability and Southwestern Willow Flycatcher Habitat; restoration of 2 culvert outlets to more successfully rewet the Stewart Meadows (Rio San Antonio floodplain) and reduce down-cutting and erosion within the floodplain; creation of a system of flow splitters to more successfully control water flow across the Stewart Meadows project area.
- 2) The original project plan was to provide demonstration days and field days for students and the public. This project was successful for its outreach to local schools where opportunities for extra curricular activities related to the sciences are not a common occurrence. In addition to presentations in the schools, field demonstration days, field hands-on workdays with students, and a weeklong Summer Academy for students and their teachers were conducted. Also, in honor of the 100th anniversary of Aldo Leopold, a volunteer work weekend was conducted at Stewart Meadows. Over 40 volunteers helped with the completion of the installation of 25 structures to improve the drainage from culvert #4 which was down-cutting and dewatering the Stewart Meadows area. The weekend's activities also included a tour of Aldo Leopold's house when he worked for the Carson National Forest, an evening of stories from the Sand County Almanac, and a botanical walk. The Albuquerque Wildlife Federation arranged for the volunteer weekend

and have plans to come back next year to conduct more restoration work at Stewart Meadows, including the continued fixing of fences that allow cattle to trespass and more culvert outlet and arroyo work. The Albuquerque Wildlife Federation and their volunteers have adopted Stewart Meadows as one of their priority projects for future volunteer field seasons.

- 3) The original project plan was to develop a conceptual plan for the Stewart Meadows project area. As an additional bonus, a planning document for the Conejos Watershed which includes the Rio de los Pinos and the Rio San Antonio was created with stakeholder input. This planning document lays the foundation for future wetlands restoration project in the area. The Conejos Wetland Action Plan was presented at the Colorado/New Mexico Border Wetlands Meeting to extend the restoration and protection of wetlands past the New Mexico portion of the Conejos Watershed and to form new partnerships with Conejos watershed partners in Colorado.
- 4) A number of key partnerships have been created with stakeholders in the project area. The Conejos Watershed Group was formed and has since obtained other grant funds to implement restoration in the watershed. The Albuquerque Wildlife Federation has formed a partnership with the Carson National Forest and will continue to help with volunteer activities in the future.
- 5) Important ecological inventory was conducted at Stewart Meadows. The bird survey indicated that endangered southwestern willow flycatchers are utilizing the area and future surveys will tell if waterfowl are using the area in increasing numbers and diversity. The botanical inventory identified more than 200 species of wetland plants with the greatest wetland diversity occurring in the wetland pond that was previously excavated but never planted. That may indicate that the plant diversity was a natural occurrence of native seed in the soils and/or seed brought in by other sources including waterfowl, beaver or flow from the Rio San Antonio. It is a good demonstration that if you create the appropriate hydrology and the habitat, the plant and animal diversity will follow and flourish.

What made the project not so successful?

The project progressed slower than expected. Change from the original implementation of a pond to the development of a more complex wetland restoration design was the principal reason for delay of project completion. Stewart Meadows is located in a remote area with an elevation of approximately 8,000 abs. The growing season is short and once winter sets in, it is not feasible to conduct on-the-ground work there, which caused delays in the construction of the wetland restoration.

What would you do differently in terms of effectiveness?

In addition to targeting schools for outreach, more could have been done with local community members to have more volunteer work done and to show the value of the Stewart Meadows Area. For those who made the long journey to visit the area, they were rewarded with the beauty and ecological diversity of the region. We also could have involved the grazing association in more informational activities. The grazing association was very involved in the Wetlands Action Plan development and the Watershed Group but could have benefited from more information on compatible grazing management and wetlands.



Bill Zeedyk and Van Clothier making measurements for a preliminary design at Stewart Meadows

Technical Transfer

What information can you pass along to other agencies, cooperators or local landowners in other watersheds about this project?

The Wetlands Action Plan portion of the project should have been included as a deliverable of the project activities from the start. The planning process and inclusion of stakeholders in the process was an invaluable part of this project, in terms of stakeholder buy-in, future planning and creating a forum to get information to the public about the activities on public land.

New and more updated information about migrating waterfowl needs is available and restoration efforts should include the input and advice from leaders in the field. For this project, the restoration outcome was greatly improved by the advice of many wetland experts.

EPA Feedback Loop

What would you suggest that EPA do differently to improve the process in regard to this project?

EPA was very supportive in all aspects of this project during the project period, especially allowing grant period extensions to complete high quality work at Stewart Meadows.

This grant was awarded as entirely contractual funding. However the Wetlands Program Coordinator and other SWQB Staff participated in all facets of the project. Staff funding was removed from the original grant request and the award was reduced, thereby relying on other sources to fund the participation of SWQB.

What about other federal partners, if any?

This project relied on the cooperation of the Carson National Forest, whose personnel made special efforts to make this project a success.

Future Activity Recommendations

Some additional restoration work is needed according to the final design and some of it will be completed in future years by volunteers. Culvert replacement will be conducted by the Carson National Forest as soon as funds become available. The Operations Plan must be adhered to and maintained in order for the flow system across Stewart Meadows to continue to work as planned. Future bird and botanical surveys would help document project success. Also the site should be revisited for follow up monitoring, adaptive management and maintenance.

Outreach to schools should be continued and a Adopt a Wetlands Program should be established at local schools.

Efforts should continue to work with the Conejos Watershed Group and the local grazing associations.



Figure 1. Stewart Meadows Upper Meadow ditch cleaning, reshaping and berm reinforcement.



Figure 2. Flow through willow clump openings



Figure 3. Flow through restored meander in Middle Meadow.



Figure 4. Upper Meadow Flow Splitter.



Figure 5. Plug and Pond system being created in old straight ditch.



Figure 6. Pothole wetlands created in lower dry meadow.



Figure 7. Boards indicate where 3 flow splitters distribute flow to fill pothole wetlands. Boards can be inserted to reduce flow in one splitter and send more flow to other open splitters.



Figure 8. New Meandering ditch created in the upper portion of the Lower Dry meadow to rewet that portion of the meadow and send sheet flow to the pond.



Figure 9. Recontoured flow path from Arroyo #1.



Figure 10. Natural recruitment of wetland plants in the pond area. It was determined that no further work would take place here to prevent disturbance of the site.



Figure 11 High Water Fence to keep cattle out of Stewart Meadows



Figure 12 Headcut control structure at Arroyo #4



Figure 13 Rock Rundown constructed by volunteers at Arroyo #4



Figure 14 Zuni Bowl Structure to prevent further headcutting at Arroyo #4.



Figure 15 Construction of exclosures around riparian vegetation to prevent further headcutting, Arroyo #4.



Figure 16 Volunteers camp at Stewart Meadows volunteer weekend, September 2009