


To: USFWS /Angel Montoya

FROM: TNC / Martha Cooper

RE: Final Project report for FBMS Agreement #: **F12 AC 00493** / Habitat restoration project for Chihuahua chub and Chiricahua leopard frog on TNC's Mimbres Preserve in Grant Count, NM.

DATE: Sept. 28, 2015

Background

The goal of this project was to benefit the recovery of Chihuahua chub and Chiricahua leopard frog, both federally listed as threatened species and restore and enhance wetland, riparian and upland habitat on The Nature Conservancy's Upper Mimbres River Preserve by removing sediments from the springs and invasive plants from the uplands.

Since 1994 Moreno and Dead Otter Springs have experienced an increase in riparian vegetation and a reduction in open water could lead to a decline of the chub and frog populations. Moreno Spring is slowly filling-in with organic debris and fewer chubs inhabit it than were found during inventories as recently as 10 years ago (NMDGF, 1996). Essentially no open-water habitat pools occurred on the Conservancy's portion of Moreno Springs.

Project administration

Our agreement with the Partners program was finalized September, 2012. The Nature Conservancy received a second extension to this project, moving the end date from December, 2013 to September 17, 2015. This enabled completion of the work outlined in the agreement as well as site-rehabilitation after the heavy-equipment work was done.

Project Planning

In 2013 Jerry Monzingo, Angel Montoya, and I met at Moreno Springs to discuss restoration opportunities. We had the general idea that we'd hire someone with a backhoe to come and dig out some areas and create more open water habitat.

In May, 2014, Dan Taylor with Bat Conservation International (BCI) coordinated a site visit by Tom Biebighauser, the lead wildlife biologist and wetland ecologist with the Center for Wetlands and Stream Restoration. Tom has extensive experience restoring wetlands and streams across the country, including the Southwest. Others present at the field included Angel Montoya, John Moeny (NM Environment Department) and Denise Smith (restoration consultant).

In consultation with Angel, TNC decided to extend the project to enable Tom to design and oversee the restoration work in April, 2015. Given the importance of the site for Chihuahua chub and Chiricahua leopard frogs, involving a professional with significant experience made sense.

In January, 2015 I attended the Chiricahua leopard frog annual meeting (coordinated by FWS) at the Ladder Ranch to enlist help from partners with the project.

BCI also contracted with Tom for restoration work in the Mimbres Valley, so his travel costs were not covered by TNC. In addition, Tom secured $3000 in funding from the Amphibian Reptile Conservancy, with the agreement that we would convene a workshop during the restoration of Moreno Spring.

Restoration work at Moreno and Dead Otter Springs (on TNC land) required Endangered Species Act Section 7 consultation. An Intra-service Section 7 Biological Evaluation and Opinion was finalized in March, 2015 prior to initiation of work at the spring (Consultation Number 02ENNM00-2014-0160) and is an excellent source of more detailed information about the project site and affected species.

Moreno Springs Restoration

The Conservancy and partners (see below) designed and implemented habitat improvements at Moreno Spring that benefited frog and chub habitat. The first step prior to initiating the restoration work was to implement conservation measures outlined in the BO. Teams of frog and fish biologists combed Moreno Springs day and night to remove and safely hold frogs and fish during implementation. Equipment was washed and sprayed. All conservation measures were followed throughout the project.

Over the course of a week, Tom Biebighauser, Mike Norris (the operator) and partners collaboratively designed the location, size, and shape by flagging the perimeter of pools. The pools were designed to have lots of inlets and uneven edges, rather than a uniform oval shape. After flagging, the trackhoe excavator then removed silt and debris from Moreno Springs, creating 14 open-water pools (3 large, 9 medium, 2 small). Some of these pools were connected to channels of water in the Moreno Springs complex, others were isolated. Approximate pool dimensions are noted in Appendix A. A map of numbered pools is presented in Appendix B. It is

not useful to translate these dimensions into linear feet, as described in the BO. The track-hoe deepened pools to a depth of 3-5 feet, consistent with the target depth described in the BO. After a pool was complete, woody debris was added to the pool (sometimes on the edge, sometimes in the middle). Clumps of sedges and grasses were also relocated back to the edge of the pool.

Tom Biebighauser and partners agreed that it was acceptable to selectively remove a small amount of mature willows during the creation of the pools. In general though, pools were placed in open areas and the majority of willows (95% approximately) remained after excavation, leaving large areas of the spring intact.

During his initial site visit Tom Biebighauser had expressed concern about head-cuts at the upper end (north) of Moreno Springs. Building rock grade control structures was evaluated in the BO. However, once partners spent more time at the site the headcuts were determined to be historic. No active erosion was observed and it was determined that rock or slash grade control was unnecessary. Tom suggested we keep an eye on the lower end of the spring at the confluence of the outlet of Moreno Spring and the Mimbres River. If down-cutting occurs here it could cause erosion to move upstream through the pools we created.

In terms of outcomes, this project clearly increased Chiricahua leopard frog habitat at Moreno Springs. Numerous egg masses were noted during subsequent visits to Moreno Springs. In August, a rough census in each pond was taken, simply by counting frogs that were seen or heard jumping in the water. This method certainly under estimated the population. Nonetheless, the conservative estimate of number of frogs (107) in August exceeded the numbers of frogs (104) captured prior to project implementation.

It is less clear to what extent this project benefited Chihuahua chub. Few chub were caught prior to excavation, suggesting that chub numbers are low or are using the downstream pool on private Moreno property. Two large and deep pools (in some areas) were constructed explicitly for chub habitat and are connected to channels of water. NMDGF has offered to help sample these pools in October, 2015.

Dead Otter Spring

For the five years prior to this project, Dead Otter Spring typically only created one small (2 foot) diameter pool near the outlet of the spring and then moist soils downstream of the outlet. At this site, one large (20 foot diameter) lined pool was established at Dead Otter Spring and two small (3 foot diameter) pools were also excavated. The pools were surrounded by slash to protect them from elk wallowing, which causes the excavated pools to quickly fill in with sediment.

Since construction one of the small pools has dried up, but open water persists at the other small pool and the lined pool**.** Overall, it appears that more water is present than previously, although the cause is unknown. In addition, elk are wallowing in a shallow muddy area just downstream of the pools near the old site of the pool (what appears to be an old tank at the edge of the field) where water collects. This is great, because elk will probably maintain this as open water habitat, albeit small.

There are a few mature willows in the vicinity of Dead Otter Spring. It is possible that these will spread to areas that are protected from browsing by elk. Partners determined that it would be best to not plant more willows at this site, which has plenty of cover for frogs and is already fairly shaded from adjacent trees (box elder and walnut)

No one had observed frogs at this site for 8 years. However, during construction one lonely frog was caught (and was unharmed). It is unknown whether more frogs are using Dead Otter Spring; frogs have not been observed there yet although thorough day and night surveys have not occurred. However, open water habitat has increased because of the excavation that occurred. Juniper removal (see below) may have helped as well.

Workshop

A hands-on restoration workshop taught by Tom Biebighauser taught participants (16) how to use practical, low cost techniques to restore wetlands for rare species of wildlife. Attendees learned how to select locations for building wetlands, test for ground water and soil texture, choose appropriate construction techniques, work with heavy equipment operators, and establish native plants. People were inspired by the project, excited to see frogs and chubs, and appreciated the peer-learning opportunity as well. Two participants stayed to help with the Dead Otter Spring project on Friday.

Juniper Removal

Junipers in the vicinity of Moreno and Dead Otter Springs and in the adjacent fields were removed with a track-hoe, effectively uprooting them and decreasing the likelihood of alligator juniper sprouting. The purpose for removing junipers was to 1) reduce competition for water around the springs and 2) maintain riparian habitat. Contractors were hired to deal with the slash created from this project.

Excavation was an effective and efficient way to remove juniper. The fields are now completely free of juniper and the density of junipers along the edge of the field and around the springs has decreased.

Site rehabilitation

During excavation silt and debris material was spread in fields adjacent to the spring. To diminish the probability of erosion bare soil adjacent to the pools was seeded and mulched with hay prior to monsoon season. By August, the bare soil was covered with grass and annuals, reducing concern about significant erosion. In addition, 100 grass plugs from the Plant Material Center were planted on the steepest slopes and immediately adjacent to pools to slow sediment movement and increase grass diversity. Because of the moist soil at the site, early watering with buckets and a decent monsoon season it appears that all of these grass plugs survived and grew substantially. The site is now well vegetated (Appendix A).

In addition, slash from the juniper removal project was used around the springs to stabilize steep slopes during the initial treatment. During the summer, juniper slash was piled in an arc above

the spring to create a berm that could intercept sheet-flows of water across the field. After the Silver Fire a flood in the Mimbres crept across the fields and through Moreno Springs. The berm will slow this water and cause sediment to more likely settle on the field instead of in the pools.

Maintenance

Cattails have appeared along the edges of some of the isolated pools. These will be removed in October, 2015, since cattails can completely take over open water habitat.

The historic headcuts and the downstream confluence of Moreno Spring and the Mimbres River will be monitored to see if erosion is occurring. I have communicated with the neighbors how important it is for them to exclude grazing at this confluence site because it greatly helps stabilize the soil.

Photos

Please see document with photos and relevant information. This document provides baseline documentation on which future monitoring will be based.

In addition, FWS staff set up wildlife monitoring cameras. We will be reviewing photos from these cameras and likely leaving some up for a longer period of time. Cameras were set up prior to the work so some should provide great before and after sequences.

Conclusion

The BO summarized the propose action:

1. Deepen Moreno Spring and restore natural spring function by the removal of silt and debris;
2. Restore naturally appearing and functioning emergent wetlands in the valley at Moreno Spring;
3. Deepen Dead Otter Spring to create a small pool for frog breeding habitat by excavating to a maximum depth of 3 ft.;
4. Removal invasive *Juniperus spp.* (juniper) along the spring and floodplain, specifically in the adjacent fallow fields.
5. Re-vegetate at Dead Otter Spring with native plant species to improve the riparian habitat; and
6. Provide a successful example for other landowners along the Mimbres River.

All of these project objectives were met, with the exception of #5, which is explained above in the "Dead Otter Spring" section. In August, 2015, 107 frogs were counted, a very conservative estimate. Open water habitat increased from approximately 100 ft^2 (where pool 14 was created) to 10,582ft^2 (based on baseline measurements of pools, see Appendix A).

Partners

An amazing group of agency, academic and non-profit partners made this project possible. Celebratory t-shirts were made to remember the great work we accomplished together. For all of us who spend too much time behind a computer and on a phone, it was exciting to be implementing a project together and see such great results. Partners and entities that coordinated and assisted with this project are listed below in approximate order of their contributions:

Angel Montoya, U.S. Fish and Wildlife Service Partners Program
Tom Biebighauser, Wetlands Restoration and Training LLC
The Amphibian and Reptile Conservancy
Dan Taylor, Bat Conservation International
Michelle Christman, U.S. Fish and Wildlife Service, NM Ecological Services Field Office
Melissa Mata, U.S. Fish and Wildlife Service, NM Ecological Services Field Office
Andrew Monie, NM Department of Game and Fish
Randy Jennings, Western NM University
Bruce Christman, Herpetologist
Cassidi Cobos, Turner Endangered Species Fund, Ladder Ranch
Vivian Porter, Turner Endangered Species Fund, Ladder Ranch
Dustin Myers, U.S. Fish and Wildlife Service, NM Ecological Services Field Office
Chris Kitcheyan, U.S. Fish and Wildlife Service, NM Ecological Services Field Office
Maceo Martinet, U.S. Fish and Wildlife Service Partners Program
Tom Cooper, Gila Native Seed
Jack Barnitz, Bureaul of Land Management (BLM)
Danny Burton, Gila National Forest, Wilderness Ranger District
John Moehny, NM Environment Dept., Silver City Office
Susan Ossam, NM Environment Dept., Silver City Office

Volunteer and Workshop Participants

Jeremy Martin, Restoration Practitioner
Van Clothier, Stream Dynamics
Steve Torrez, BLM
Corey Durr, BLM
Ciara Cusack, BLM
Cynthia Wolf, Restoration Practitioner
Delbert Utz, NM Environment Dept., Retired
Dave Menzie, NM Environment Dept., Retired
A.T. Cole, Pitchfork Ranch
Linda Delay, NM Energy, Minerals and Natural Resources Dept. Mining & Minerals Division
Cullen Hallmark, Quivira Coalition
Cody Robertson, Natural Resource Conservation Service
Justine Reid, Natural Resource Conservation Service
Daniel Guevara, NM Environment Dept., Surface Water Quality Division
Jennifer Douglas, Rio Milagro
Tom Myers, NM-TNC Board Member

Appendix A: Photos and Baseline Monitoring Data

Appendix B: Map of pools