# Chico Basin Riparian Restoration
# 2012 Final Report

**Implemented by**

Wildlands Restoration Volunteers

November, 2011 - April, 2012

Note: This report covers year two of Riparian Restoration work at Chico Basin Ranch. The continuation of a larger restoration effort affecting many miles of stream and the larger watershed is being planned by project partners another two years assuming sufficient funding can be obtained.

**PROJECT SUMMARY**

The Chico Basin Ranch Riparian Restoration Project was among many projects approved for implementation by a committee of 35 WRV volunteers in 2011. Committee members were asked to evaluate projects on many levels, including ecological importance, fit with WRV's mission, logistical requirements, available supporting and lead partnerships, leadership needs, financial resources needed and available, number of obstacles to project completion, number of volunteer-days necessary to complete the project, the ability of the project to satisfy volunteers, and how the project would complement others in the WRV project season.

The Chico Basin project ranked high in our selection process due to the existence of a dedicated and knowledgeable partnership, including the Colorado Parks and Wildlife, Chico Basin Ranch, The Rocky Mountain Bird Observatory, Natural Resources Conservation Service, and many others, and the fact that conservation is a central driving theme for the ranch.

Project team coordination, logistical planning, and technical design were carried out in the winter of 2011/12, followed by two volunteer projects in the early spring of 2012 (willow harvest and plant installation). In total, over 50 volunteers contributed over 2040 hours of planning and implementation time towards this project, installing over 1,200 native shrubs and trees. The project team employed to plan and implement these projects included:

Raghavendra Paturi: Project Lead
Jennifer Kovecses: Assistant Project Lead
Gregg Campbell: Alan Carpenter and John Giordanengo, Technical Advisors
Raymond Bridge: Tool Manager
Sally Lincoln: Project Support Cook (PSC)
Agency Partners: Laura Quattrini (RMBO), Michael Moon (Chico Basin Ranch), Ed Schmal (CPW), and Nathan Schmitz (NRCS).
WRV Staff Liaison: John Giordanengo

**Planning and Implementation Timeline**

Project Planning and Project Team Coordinating --------- October, 2011 – March, 2012
Volunteer Leader Training ---------- March-April, 2012
Volunteer Recruitment ---------- December, 2011 – March, 2012
Technical Design ---------- February – March, 2012
Materials Acquisition ---------- March, 2012
Project Implementation ---------- March, 2012
Project debriefs/evaluation ---------- March, 2012
Monitoring---------- August, 2012

## Project Summary

Chico Basin Ranch is located Approximately 40 miles SE of Colorado Springs in the Chico Creek watershed. Lat-Long: 38.5317$^{o}$N, -104.4494$^{o}$W (see location map below). The primary goal of this long-term project is to control Russian olive and tamarisk on heavily infected riparian area, reduce grazing pressure in key riparian area conservation hotspots on the ranch, and restore a diverse native tree-shrub community along treated and protected areas. In the Vega drainage, which feeds into

Chico Creek, over 20 acres of Russian olive has already been treated, and five exclosures have been erected in treated areas by project partners. This project focused on installing site-appropriate native woody shrubs and trees in treated and fenced areas.

## Project Planning

WRV's staff and volunteer project team coordinated closely with all partners to ensure project goals and objectives were clearly understood, and addressed with appropriate technical and logistical plans. Team members attended several site visits, undertaking planning work that resulted in the establishment of five separate restoration sites (A-E; see maps below) along Vega Creek. Russian olive trees on these sites have been treated and fencing has been installed to exclude cattle, deer, and both types of grazers depending on the fence type. Restoration treatments were prescribed for 100-foot work sections in each site based on soil type, hydrology, and competing vegetation. Detailed technical specifications were prepared for land management agency partners and project crew leaders. These technical notes reflected data collected and knowledge gained by WRV and partner staff who evaluated similar work implemented on Chico Basin ranch by project partners in 2011.

The 2012 site was flagged and staked at 100-foot intervals in coordination with technical section notes to facilitate coordination between notes, on-the-ground conditions, and staged materials. All five sites were prepared ahead of time (fencing, augering of holes for cottonwood poles, and staging of fill soil) by ranch staff, to create conditions that allowed for the most efficient use of volunteer labor possible. Baseline photo points (below, page 4-5) were taken prior to project completion, and will be repeated this summer along with survivorship counts.

## Goals and Results

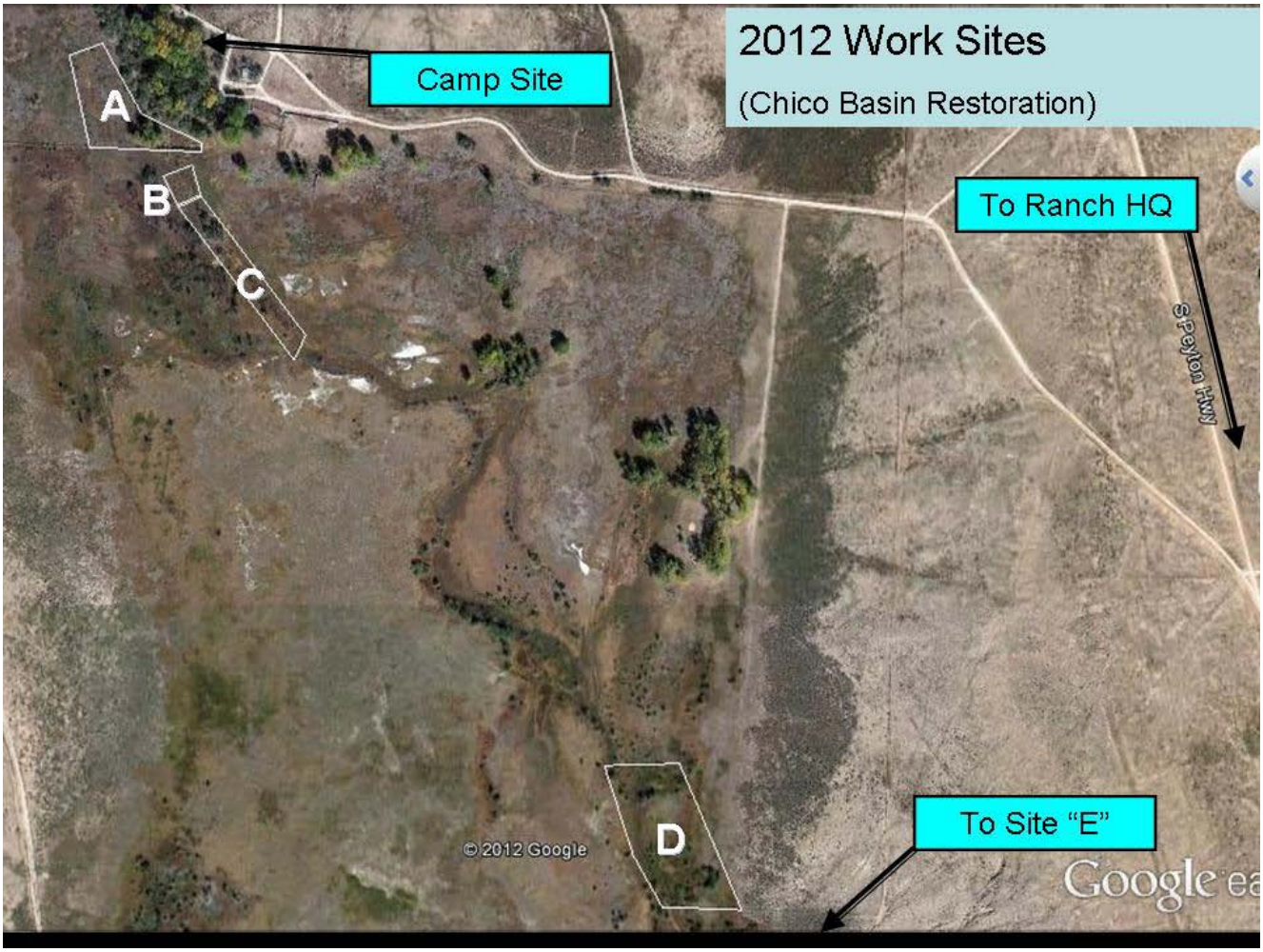
The goal of this project was to install a variety of native riparian shrubs and trees to: (a) replace the specific vertical structure lost by the cleared Russian olive forests in the short term, and (b) create a structurally diverse woody riparian community in the long term. In total, over 1,230 native shrubs and trees were installed in approximately 7.4 acres of grazing-excluded riparian areas along Vega creek. Additional technical details can be found in the methodologies section below. Time will tell if the project goals were met, as survivorship must be tracked over time to determine the recovery trajectory of this restored riparian plant community.

Overall the project was very well executed, no volunteers or staff were injured in the process, and the level of quality of work was high. Four well-received educational talks were provided to volunteers throughout the two volunteer weekends, providing volunteers with a conservation perspective on ranching (Michael Moon, Chico Basin Ranch), the role of The State Land Board in Conservation (John Valentine), as well as the importance of healthy plains riparian areas for wildlife and water quality (Laura Quattrini, RMBO), and a bird hike (Bill Maynard).

Partners were very happy with the results and highly support working with WRV on similar projects in the future. As a result, WRV is working with project partners to fund and plan similar projects in 2013 and 2014.


Vega Revegetation Project
on Chico Basin Ranch
Teller
El Paso
Fremont
Pueblo
N

C


2012 Work Sites
(Chico Basin Restoration)
Camp Site
A
B
C
To Ranch HQ
S Peyton Hwy
D
© 2012 Google
To Site "E"
Google


2012 Work Sites
(Chico Basin Restoration)
E

# Chico Basin Riparian Restoration Project

2012 Sites (Vega and Holmes Springs)

Refer to Map for area locations, and section notes for GPS coordinates

Area A – Chico Basin 2012 (from 0+00)

Area B – Chico Basin 2012 (from barn)

Area C – Chico Basin 2012 (from Area B)

Area D – Chico Basin 2012 (from 0+00)

Area E – Chico Basin 2012 (from gate)

Area E – Chico Basin 2012 (from spring)

Area E – Chico Basin 2012
(from confluence of spring and creek)

## Methodology

Fencing: Five grazing exclosures were installed, all of which were designed to keep cattle from entering the restoration sites. Sites A and E were designed to also keep deer from entering the restoration sites there, in order to provide a comparison to shrub establishment under all ungulate grazing exclusion, and from exclusion of cattle only.

Russian olive removal: Cut stump removal, and hydro-axing followed by herbicide application of resprouts, were the treatments employed by Chico Basin Ranch to eliminate the Russion olive trees on site. The ranch will continue to treat the resprouts as necessary, in a manner that does not impact installed native shrubs and trees.

Plant species selection: The specific listed below were narrowed down from a broader list of potential plains native trees and shrubs appropriate for riparian areas. Shorter stature shrubs such as western snowberry and Wood's rose were intentionally removed from the list in favor of shrubs that would provide a higher canopy elevation. The higher elevation shrubs and trees were selected by the partnership team in an attempt to meet an important site-specific goal, which was to provide the tallest average shrub cover, in order to mimic the habitat provided by Russian olive trees that migratory birds have been using at this site for decades. Also, the long-standing bird-banding station had been set up in Russian olive trees, now gone from the site, which are much taller than many native riparian shrubs.

Golden currant was on the list of plants to install, and was ordered, but did not wind up being planted due to a communication error with the nursery. To compensate for this, we planted a higher number of chokecherry and peachleaf willow than originally planned.

Planting methods and lesson's learned: WRV's analysis of previous riparian restoration efforts on the Vega property indicated that, while many of the plants appeared to be installed in hydrologically-appropriate zones, several challenges caused high plant mortality over the course of the first growing season. While it is certainly not our intent to highlight the results of the previous project, we would like to take the opportunity to shed light on some of the restoration treatments we implemented in the 2012 project with the hopes of improving the chances for success.

- Cottonwood Poles: Cottonwood poles were harvested from a young (2" and less diameter) stand near the project site, and hauled directly to Chico Basin Ranch, where they were stored in a stock pond for seven days before installation. The bottoms of the poles were cut fresh at a diagonal prior to installation into augered holes, so that the final height of the pole stood no more than 6' above the ground. The space around the poles was backfilled with a dirt-water slurry in order to ensure solid soil/stem contact throughout the length of the cottonwood pole in the augered hold.
    - Previously-installed cottonwood poles stood between 10 and 16 feet above the ground, making them much more vulnerable to high winds, and requiring a much greater distance for sap to travel from root to leaf. In addition, it appears that, without a slurry, backfilling with dried clay soil made it near impossible to create solid soil-stem contact in the aguered holes.
- Peachleaf and coyote/sandbar willow cuttings: these cuttings were treated in a similar fashion to the cottonwood poles, with the most vigorous material being no greater than 3/4 inch in diameter. Cuttings were installed in 1 inch diameter by 3-foot long pilot holes and native soil was wedged back against the installed cuttings. The tops of installed cuttings

- were trimmed about 18" above the ground, accounting for the height of competing herbaceous vegetation. All cottonwoods and willows were installed on the fringe of the wetland green-line, high enough to avoid anoxic soil conditions, yet not so high that the bottom of the cutting could not be installed with at least 4 inches into the water table.
- Bare root shrubs were installed, upon research findings, without any artificial fertilizers or hydration pellets. However, they were installed in the upland fringes just above the greenline areas, so that their roots had a good chance of being irrigated naturally via the capillary fringe above the water table. In addition, a circle of sod extending beyond the dripline of each installed shrub was removed before plant installation. After plant installation, the sod was used to anchor a dense weed fabric over the top of the planting hole. One to two staples were used in addition to the anchoring sod in order to keep the weed fabric firmly anchored to the ground. All installed plants were watered thoroughly (both in the planting hole, and above the installed plant).
    - Previously-installed shrubs appeared to be located in appropriate locations, but weed fabric appeared to be inadequate to suppress weeds. Beyond this, we are not certain what variables may have contributed to the mortality rate, estimated at 50% survival in the first growing season.

Other Lessons Learned: by examining the texture and mottling of soils brought to the surface by augering holes for cottonwood poles, the following lessons were learned, which may impact survivorship and the future planning of restoration projects along the Vega and Chico creeks:

(a) from upland holes that were augered beginning at the same elevation (i.e., above the greenline) above the existing surface water of the creek, subsurface soils varied dramatically over a short spatial scale. For example, soils varied from dense mottled clay to pure sand, with most soils containing a texture and wetland indicators somewhere between these two extremes.
(b) Depth to groundwater varied dramatically, and did not appear to be readily determined by elevation above the creek of augered holes. However, holes were only observed for no more than eight hours, to see if water did percolate into the dense clay soils after augering. Field adjustments were made to create deeper holes (as much as 10 feet below the soil surface in sandy areas high above the greenline, or areas where no water percolation was observed in augered holes over a reasonable time frame).
(c) Monitoring results in the future will determine other lessons learned.

**Expectations for survivorship:** It is our hope that, by evaluating the previous work on this site, and utilizing the practices listed above, that the installed shrubs will have a higher chance of success. However, given the challenges of this site (i.e., marginal water table in the middle of the growing season, competition from tall grasses and other weeds, and dramatically shifting soil types over a narrow spatial scale), achieving a survivorship rate greater than 70% (for bare root shrubs), 80% (for coyote and peachleaf willow), and 60% (for cottonwood poles) may be challenging without supplemental surface irrigation.

Refer to the tables below for numbers of each species planted, by section. A breakdown of total species planted in 2012 is as follows:

## Total Plants, by species:

| Species Name | Common | Form | Size of Container | All Sites |
|---|---|---|---|---|
| *Paddus virginiana var melanocephala* | choke cherry | shrub | bare root | 461 |
| *Populus deltoides* | plains cottonwood | tree | poles | 113 |
| *Ribes aureum* | golden currant | shrub | n/a | 0 |
| *Salix amygdaoides* | peachleaf willow | tree | bare root | 50 |
| *Salix amygdaoides* | peachleaf willow | tree | cuttings | 58 |
| *Salix exigua* | coyote willow | shrub | cuttings | 591 |
| | | | **Total:** | 1273 |

## Total Plants, by section and species:

### Area A

NOTE: Augered holes between stream and banding station contained significant sand, and showed adequate water at 4-6' down.

GPS coordinates of northern boundary of Area A: 0546501 - 4265851, UTM, WGS84, Zone 13

| Area | Station Line | | No. cottonwood poles | No. peach leaf (bare root) | No. peach leaf willow stakes | No. coyote willow stakes | No. golden currant bare-root | No. chokce cherry bare-root |
|---|---|---|---|---|---|---|---|---|
| | TOTALS | | 40 | 20 | 0 | 12 | 0 | 113 |

### Area B

NOTE: This section includes significant wetland soils, and shallow distance to water table. Difficult for Cottonwood establishment.

GPS coordinates of southern boundary of Area B: 546558 - 4265535, UTM, WGS84, Zone 13

| Area | Station Line | | No. cottonwood poles | No. peach leaf willow stakes | No. peach leaf willow stakes | No. coyote willow stakes | No. golden currant bare-root plants | No. chokce cherry bare-root plants |
|---|---|---|---|---|---|---|---|---|
| | TOTALS | | 9 | 8 | 0 | 140 | 0 | 36 |

### Area C

NOTE: Area C is immediately down stream of Area B, and includes a long skinny fenced section of creek.

GPS coordinates of southern boundary of Area B: 546558 - 4265535, UTM, WGS84, Zone 13

| Area | Station Line | | No. cottonwood poles | No. peach leaf willow stakes | No. peach leaf willow stakes | No. coyote willow stakes | No. golden currant bare-root plants | No. chokce cherry bare-root plants |
|---|---|---|---|---|---|---|---|---|
| | | Total: | 16 | | | | | |

### Area D

NOTE: This area is immediately upstream of Area E (see area map)

| Area | Station Line | NOTES | No. cottonwood poles | No. peach leaf bare root | No. peach leaf willow stakes | No. coyote willow stakes | No. golden currant bare-root plants | No. chokce cherry bare-root plants |
|---|---|---|---|---|---|---|---|---|
| | | Total: | 20 | | 10 | 50 | | 40 |

### Area E

GPS coordinates of southern boundary of Area E: - , UTM, WGS84, Zone 13

| Area | Station Line | NOTES | No. cottonwood poles | No. peach leaf bare root | No. peach leaf willow stakes | No. coyote willow stakes | No. golden currant bare-root plants | No. chokce cherry bare-root plants |
|---|---|---|---|---|---|---|---|---|
| | | | 28 | 22 | 48 | 389 | 0 | 272 |
| | | GRAND TOTAL: | 113 | 50 | 58 | 591 | 0 | 461 |

## Monitoring

Chico Basin Ranch has been monitoring transects since 2002 to make better management decisions and to analyze grazing management programs and their outcomes. These transects can be viewed on line at: www.landekg.com; User name: duke, Password: ranchdata. Areas on Vega creek have been fenced completely to create control areas to better analyze the effects of prescription management strategies. To further understand the impacts of grazing in riparian areas, and the affects of riparian restoration treatments, as well as the interactions of grazing on these treatments, Chico Basin has and will continue to install a complex of exclosures in the riparian areas along Vega Creek that allow for no grazing of wildlife or livestock. These areas will aid in understanding the impact of management decisions in riparian corridors. The exclosures were designed and built in consultation with CDOW and NRCS personnel, at a variety of distances from pools of water and areas where young woody plants are beginning to respond to the rest and grazing management.

In addition to ranch monitoring efforts, WRV has tracked areas of plant installation, and has established baseline photos of each site that received restoration treatments. Follow-up monitoring will be conducted in 2012 and 2013 to determine survivorship of installed plants and condition of restored sites relative to the baseline condition.

Continued monitoring (5-10 years) is necessary to evaluate long-term success, and determine if the desired shrub cover and architecture is being achieved. Such long-term monitoring will require a collaborative effort by all project partners involved to make sure that project goals were met. If monitoring results indicate that goals were not met, project partners will need to understand why and develop appropriate restoration treatments to address the shortcomings.

**CONTACT INFORMATION**

For additional details, please contact John Giordanengo, Wildlands Restoration Volunteers, at john@wlrv.org or 970-493-2075.