

# **Farmers Mutual Ditch Environmental Mitigation Project for the Army Corps of Engineers**

USDA NRCS Los Lunas Plant Materials Center

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The LLPMC planted 940 cottonwood (*Populus deltoides*) pole cuttings, 400 black willow (*Salix nigra*) pole cuttings, and 9,000 coyote willow (*Salix exigua*) whip cuttings on a 35-acre site on the north bank of the San Juan River. This planting was a direct result of a cooperative, riparian restoration project between the Los Lunas Plant Materials Center (LLPMC), the Army Corps of Engineers (ACE), and the Bureau of Land Management (BLM). The site is located approximately 10 miles west of Waterflow, New Mexico (T29NR16W Sec9 NW 1/4) on an old, abandoned irrigated farm field now managed by the BLM.

This project is intended to mitigate for environmental losses of riparian native plants due to the concrete lining of a major irrigation canal in the Kirtland/Waterflow area. This is the first large demonstration riparian planting done by the LLPMC in the northwest corner of New Mexico. The site will be used for local tours by these cooperative agencies.. There is no intent to irrigate this field. However, BLM plans to establish two large ponds on this site.

## **Methods**

During the first phase of the project in the winter of 2003, site preparations began when the BLM cleared a 1,000-foot stand of Russian olive (*Elaeagnus angustifolia*) on the north bank of the San Juan River. The debris from the trees was piled on the bank of the river to protect the bank during high river flows (Figure 1).



Figure 1: Russian olive debris piled on the river bank for erosion protection.

In December 2003, the second phase of the project involved harvesting 9,000 vigorous coyote willow whip cuttings from the Bureau of Reclamation's (BOR) low flow canal on the west side of the Rio Grande, about five miles south of Socorro, New Mexico. The willows were harvested daily for a two week period. At the end of each day, the willow cuttings were transported to the LLPMC and placed in water baths to keep them hydrated. The final phase of the project involved restoring this farm field back to a riparian plant community. Using a 10-amp electric rotary hammer drill, the willows were planted on the riverbank in sandy soil to a 30-inch

depth and placed on 1–2-foot centers. This planting intends to stabilize the bank and provide wildlife habitat (Figures 2 and 3).



Figure 2: Planting coyote willows on the north bank of the San Juan River with electric rotary hammer drills near Waterflow, NM.

The Rio Grande cottonwood pole cuttings were originally collected from the Bosque del Apache Wildlife Refuge and were established in a pole production plantation at the LLPMC. The cottonwood pole cuttings (12–15-ft. in length) were planted on 15–20 foot centers using an 8-foot auger, 10 inches in diameter and mounted on a front-end loader of a 65-hp farm tractor (Figure 4).



Figure 3: Planting cottonwood pole cuttings with a 65-hp farm tractor with a front-end loader mounted

The cottonwood pole cuttings were planted at locations where the auger could drill 8-ft. deep; easily reaching the 4–6-ft .water table that existed during the planting period (February 2004). Each cottonwood pole cutting was protected from beaver predation with a 5' high by 30" in diameter poultry wire tree-guard. There were large open areas of the planting site located near the river where the auger could not penetrate a gravel layer below the surface (approximately 3 ft. down). Because the intended planting holes were dry at this shallow depth, the pole cuttings were not placed in these holes.



Figure 4: The site before planting willow on the San Juan River near Waterflow, NM in February 2004.

## Results

The planting was evaluated for rate of survival in June of 2004 by Ernie Janke (ACE), Patty Phillips (ACE) and Greg Fenchel (LLPMC). We estimated an 80 percent (or greater) survival rate for the coyote willow whip cuttings (Figure 5). There were areas of the planting where patches of willows had dead tops, but they were readily re-sprouting at the base of the whips. These areas were located on sites higher than 5 feet above the river (Figure 6).



Figure 5: Same site after planting coyote willow in June of 2004



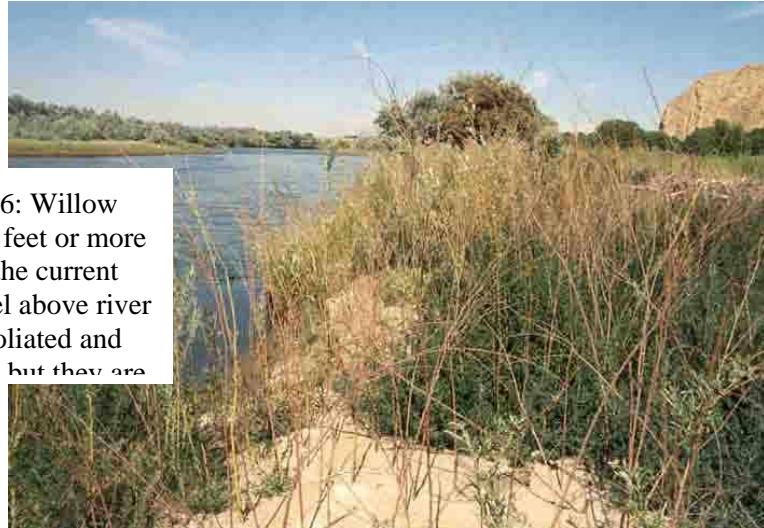


Figure 6: Willow planted 5 feet or more above the current water level above river are defoliated and dried out but they are

The Rio Grande cottonwood pole cuttings displayed a 95 percent survival rate (Figure 7). There were 43 dead pole cuttings, appearing randomly throughout the planting.



Figure 7: Cottonwood pole cuttings in June of 2004, three months after planting.

The black willow pole cuttings displayed a 64 percent survival rate. The willows had leafed out, but the leaves of the main stems and branches had dried up and died. Some of these willows may re-sprout at the base. The black willows may have performed better if they had been planted closer to the river where the soil has a higher amount of moisture. However, at the time, the debris from the removal of the Russian olives occupied this planting area.