

Aerial Treatment of Salt Cedar Within Threatened and Endangered Species Habitat—A Success Story

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Abstract—The Lower Rio Grande Salt Cedar Control Project treated 7,648 acres of monotypic *Tamarisk* (Salt cedar) in riparian areas along the Rio Grande in Socorro, Sierra, and Dona Ana Counties in New Mexico. We contracted North Star Helicopters, Inc. to do aerial treatment of these Salt cedar stands. The biggest issue in doing this treatment was the presence of the Southwestern Willow Flycatcher, an endangered bird species that is now nesting in Salt cedar. For this project to be undertaken, we had to ensure the USFWS that no treatment would occur within the ¼-mile buffer radius of the Southwestern Willow Flycatcher's nesting sites. We had ESRI (Environmental Systems Research Institute, Inc.) shape files of the nesting sites with the ¼-mile buffer. These files were uploaded into the on-board Trimble GPS units on the helicopters and marked as exclusion zones. The spray pump could not be activated when the helicopter was within this zone. The on-board GPS units also had real-time differential correction. ESRI shape files of the areas to be treated were loaded into the GPS units. When the helicopter was within the boundaries of these files, the spray pump could be activated. When outside of these boundaries, the spray pump could not be activated. This project was very successful. It was done with several constraints such as the exclusion zones, and the time period allotted for treatment. Current technology allows us to do accurate and safe treatment.

Introduction

In the spring of 2002, the New Mexico State Legislature appropriated \$5 million for Phreatophyte control along the Rio Grande and Pecos Rivers in New Mexico. Again, in the spring of 2003, the New Mexico State Legislature appropriated another \$1.2 million for this project. These funds were directed to the Soil & Water Conservation Districts along the Rio Grande and Pecos Rivers with the following provisions: development of management and native vegetation restoration plans, conducting hearings within the local conservation districts to receive public input, carrying out aerial spraying only by helicopter or ground application with prior public notice, monitoring and evaluating the effects of control on wildlife, water quality, vegetation, and soil health, and if control affects threatened or endangered species, the projects proponents will take action to ensure compliance with applicable federal law and conformance to any duly enacted recovery plan. The Lower Rio Grande Salt Cedar Control Project encompasses the Rio Grande River from the Northern Socorro/Valencia County line to the US/Mexico border.

There are four Soil & Water Conservation Districts involved in the Lower Rio Grande Salt Cedar Control Project-Socorro, Sierra, Caballo, and La Union.

Within the project boundaries, there are tens of thousands of acres of monotypic Salt cedar and thousands of acres of Salt cedar understory beneath cottonwood/willow stands. The proponents of this project chose these large monotypic stands of Salt cedar as the treatment priority. These areas for treatment were chosen for the following reasons: the fire danger that large monotypic stands pose and the cost of treatment of these large stands. The areas that we treated ranged from 2,000 to 7,000 stems of Salt cedar per acre.

The primary concern and largest obstacle to overcome with this project was the presence of the endangered bird species the Southwestern Willow Flycatcher. This bird is now nesting in Salt cedar. We had to ensure that these nesting sites and habitat of the Southwestern Willow Flycatcher would not be destroyed or degraded. We worked with Ecological Services of the U.S. Fish & Wildlife Service to determine a suitable buffer zone for the Southwestern Willow Flycatcher.

Salt Cedar Control—The First Step

Our first step in restoring the riparian native vegetation along the lower Rio Grande River was the treatment of the large monotypic stands of Salt cedar. This was done by aerial application of the herbicide Arsenal (BASF) from a helicopter. Arsenal is an amino acid synthesis inhibitor of the Imidazolinone family. The chemical in Arsenal is Imazapyr which inhibits the production of the enzyme AHAS (Acetohydroxy acid synthase). AHAS is found only in plants and it converts three key amino acids that are only found in plants (Zaliene, Leucine, and Isoleucine) into protein so that the plant can grow. When this enzyme is inhibited, the plant is then unable to grow and eventually uses up all of its carbohydrates. Imazapyr does not harm vertebrate or invertebrate animal life. Imazapyr also dissipates quickly in the environment, particularly in water. The Socorro Soil & Water Conservation District contracted with North Star Helicopters, Inc. for this aerial application. The contract was awarded to North Star Helicopters, Inc. because they had the capability of taking ESRI (Environmental Systems Research Institute) shape files and uploading them into the on-board GPS (Global Positioning System) units on the helicopters. ESRI shape files of the known nesting sites of the Southwestern Willow Flycatcher with the ¼-mile buffer zone were loaded into these GPS units and marked as exclusion zones.

The areas to be treated were also GPSed using a hand held Trimble III GPS unit. These shape files were differentially corrected and loaded into the helicopter's GPS units. The helicopters had real-time correction. When the helicopter flew into the area that was designated to spray, the GPS unit would allow the helicopter's spray pump to be turned on and thus allowing the pilot control only within the designated boundaries. This was accomplished by creating a prescription file for the onboard GPS for the area to be treated that only allowed the spray to be turned on when within this boundary file. The two helicopters detailed to this project were wired to have automatic shutoff of the spray system when the ¼-mile buffer zone around these sites was reached. This helped assure that the application would not be turned on over the Southwestern Willow Flycatcher areas. This was the first practical application using this technique by North Star Helicopters, Inc; all previous applications were only for the use of testing the system. Not all GPS units have this ability, although they could have similar features, but the pilot could override the feature without even realizing that he was doing so. To ensure that the pilot could not override this feature by accident, North Star Helicopters,

Inc. placed the override switch in a hard to reach area of the control panel. This extra feature provided by North Star Helicopters, Inc. allowed for an extremely successful treatment program in the Lower Rio Grande Salt Cedar Control Project area. A total of 436 acres of Salt cedar were effectively treated on the Sevilleta National Wildlife Refuge around the nesting sites and territories of the Southwestern Willow Flycatcher. Another 800 acres of private land were treated next to the Southwestern Willow Flycatcher nesting sites.

The aerial application began on September 5, 2003 on the Rio Salado, a major tributary to the Rio Grande. Aerial application concluded on September 23, 2003 near Rincon in Dona Ana County. North Star Helicopters, Inc treated a total of 7,648 acres of Salt cedar aerially with the use of two helicopters. Nine hundred forty-one acres of Salt cedar on the Rio Salado were treated in partnership with the Bureau of Land Management-Socorro Field Office. They funded this in the amount of \$152,200 and 70 gallons of the herbicide Arsenal. Also in partnership with the Bureau of Land Management-Albuquerque Field Office and the Cuba SWCD, another 262 acres of Salt cedar were treated near Cuba, New Mexico. The Bureau of Land Management-Albuquerque Field Office funded this in the amount of \$50,000. Twelve hundred acres of Salt cedar were treated on the USFWS-Sevilleta National Wildlife Refuge. Sevilleta National Wildlife Refuge funded this project in the amount of \$140,000. Twelve hundred forty-six acres of Salt cedar were treated around Elephant Butte for the Bureau of Reclamation. Sixty acres were treated for the City of Truth or Consequences in Cuchillo Negro Dam. Three thousand nine hundred ninety-eight acres of Salt cedar were treated on private land.

There were no measurements of Arsenal deposition within the ¼-mile buffer zone of the Southwestern Willow Flycatcher nests. The New Mexico Department of Agriculture-Pesticide Division did inspect this job using moisture sensitive placards placed within the treatment zones, next to the treatment zones, and outside of the treatment zones. No herbicide application occurred outside of the treatment zones. The New Mexico Department of Agriculture-Pesticide Division was very pleased with the control measures of this project. The U.S. Fish & Wildlife Service also did not require us to test for Arsenal deposition within the Southwestern Willow Flycatcher buffer zones, as they were satisfied with the control measures of this project.

The project was successful with the use of this technology. We worked in partnership with the U.S. Fish & Wildlife Service-Ecological Services and Regional Office, the Bureau of Land Management, the Bureau of Reclamation, the NM State Land Office and North Star

Helicopters, Inc. By pooling our funds and resources, the project was streamlined and more work was completed on the ground.

Salt Cedar Control—The Next Steps

This is our first step and the easiest step in our Salt cedar control. We are currently writing individual conservation plans with each of the landowners, taking into account their desires for their land. Each of the Federal and State Agencies are treated as an individual landowner. Each of these agencies has rules and regulations to follow. This is incorporated into their plans. The re-vegetation of these areas after the removal of the Salt cedar is our most important step. Removal of the dead Salt cedar will be done two to three years after the aerial treatment. The dead Salt cedar will be burned or bulldozed followed by burning of the brush piles. In some instances, such as the Rio Salado, the dead Salt cedar will be left in place as bank stabilization and habitat for Raptor species. We anticipate that the native seed source is still present in this tributary to the Rio Grande and that the seeds will establish once the competition for water has been eliminated.

We must re-establish native vegetation and integrate re-treatment into the plans. The salinity of the soil will determine the type of re-vegetation. The Socorro Soil & Water Conservation District has a Geonics EM 38 soil salinity meter that measures the salinity both vertically and horizontally. In areas with high salinity, plants such as salt grass will have a better chance of establishing. Some areas will require aerial reseeding. This action may have to be repeated. The treatment areas also have no water rights. Therefore, our reseeding process will coincide with our normal monsoon season. Our office will also do re-treatment of Salt cedar sprouts. It is our goal to re-establish a native riparian ecosystem to our portion of the Rio Grande River thus enhancing habitat not only for the endangered species such as the Southwestern Willow Flycatcher and the Silvery Minnow, but for all wildlife. The large monotypic stands of Salt cedar do not provide good habitat for wildlife.

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