



AMISTAD

Inventory of Vascular Plants Amistad National Recreation Area

Source: J. Poole, Texas Parks and Wildlife Department.

PROJECT SUMMARY



Lake Amistad.

Introduction and Background

In 2002, the Chihuahuan Desert Network supported a two-year inventory of the vascular plants in Amistad National Recreation Area by the Wildlife Diversity Program of the Texas Parks and Wildlife Department. Three Texas ecoregions converge within Amistad: mixed Tamaulipan shrublands, oak-juniper woodlands of Edwards Plateau, and Sotol-lechuguilla Chihuahuan desert scrub. Plant communities are influenced by climate, geology, soils, topography, and hydrology. Amistad is primarily an arid environment, which has springs, rivers, and a reservoir, which contributes to the presence of more mesic (moderately moist) vegetation than is typically found in this region.

Amistad vegetation is impacted by previous and current land use in and around the area. Fire suppression may have led to an increase in woody vegetation and ranching was common throughout the area. “Improvements” to the range and disturbances associated with development, such as removing woody, native vegetation and seeding nonnative grasses for forage and associated impacts also shaped the land. Some areas along the low-lying land beside the Rio Grande may have been used for irrigated row crops, but are now inundated by Amistad Reservoir. Areas along the changing edge of the reservoir are disturbed.

A 2002 list of plant communities and vegetative structure proposed by park staff presents several vegetation alliances present in Amistad: three woodland, three shrubland, two herbaceous, and two sparse (rock outcrop or butte and open cliff sparse alliances). Prior to 2002, only one inventory of plants was conducted in Amistad and it was limited to the recreation area reserved by Laughlin Air Force Base; no comprehensive inventory of vascular plants had been completed at Amistad.

Methods

The researcher determined sampling locations with former park staff based on previous experience in Amistad and with the flora, topography, and hydrology. In total, 106 sampling sites were identified and 69 were selected as highly diverse botanical areas and/or were large areas of vegetation that were

not inundated by the reservoir. Ten of the remaining sites (primarily small canyons along the Rio Grande and Devil’s River) were randomly selected for investigation.

Prior to sampling, the researcher compiled lists of plant species potentially occurring in Amistad from existing surveys in nearby state-managed areas, literature searches, and herbarium searches at University of Texas at Austin, Texas A&M University, and Sul Ross State University. The researcher also examined park specimen collections created in the 1970s and in 2001.

When species were encountered in the sampling locations, the researcher recorded the site in which they were found and frequency of the species, based on a visual estimate. Voucher specimens were collected for species that had not been previously vouchered and when positive identification could not be made in the field. When possible, two vouchers were collected for inclusion in the University of Texas at Austin and Sul Ross State University herbariums. Vouchers were compared to the herbarium collections to check accuracy and range.

Results

A total of 61 sites were visited, including 57 of the original planned sites. Some sites were visited more than once, nine sites were not visited because of difficult access, two randomly chosen sites were skipped as it was felt that they would add no new plant records, a different canyon than planned was sampled by accident, and three additional sites were visited.

The researcher observed 582 vascular plant taxa during the survey. Of these, 40 had not been previously observed in Amistad. The researcher also located 124 additional vascular

lar plant taxa through the literature and herbarium searches of specimens previously collected in Amistad, though these taxa were not observed during this inventory. The researcher concluded that an additional 123 species are highly likely to occur in Amistad, including five nonnative species, but were not observed in this survey. Forty-two nonnative species were observed during this survey, and an additional seven nonnative species were documented in Amistad prior to this survey. Based on this researcher's survey, 116 species listed on the 2002 potential species list either do not occur or are highly unlikely to occur in Amistad, generally because of misidentifications or taxonomic changes or discrepancies in range.

A total of 76 plant communities were identified in Amistad, 48 of which fall within the broad plant alliances proposed by park staff in 2002. Many of the 28 communities that did not fit within the plant alliances were disturbance and/or wetland, aquatic, or intermittently flooded communities.

Most of the plants observed in Amistad are encountered *rarely* (63%; found at less than 10 sites) or *infrequently* (17%; found at 10–25 sites). A total of 16% of species were considered *common* (found at 26–40 sites) and 2% were considered *frequent* (found at 41–50 sites) or *abundant* (found at more than 50 sites).

Discussion

Amistad's high vascular diversity may be related to the large geographic range the site covers. Nonnative species account for 7% of the vascular plant species in Amistad. Most (63%) species observed in Amistad were observed rarely (fewer than 10 individuals or patches at a site, and present at less than 10 survey sites). The 10 most common species were native woody plants. Nonnative grasses, such as King Ranch blue-stem (*Bothriochloa ischaemum*) and Bermuda grass (*Cynodon dactylon*), are in the top 20 most common species in Amistad and are highly prevalent in the inundation zone.

Many of the plant communities identified in Amistad are directly related to human-caused disturbances and are associated with the level of the reservoir. The blackbrush acacia (*Acacia rigidula*)-cenizo (*Leucophyllum frutescens*)-Guajillo (*Acacia berlandieri*) shrubland plant alliance was the largest and most widely spread plant community observed in Amistad; the researcher observed 26 plant communities in this alliance.

The researcher did not find any examples of the suggested curly mesquite (*Hilaria belangeri*)-sideoats grama (*Bouteloua curtipendula*) herbaceous vegetation alliance. However, eight other grassland communities were identified during this survey. Nearly all of these communities consisted of nonnative species or native species of poor forage quality, indicating the areas were severely over used.

Plant communities more common to the Chihuahuan Desert were observed on the western side of Amistad, though they were represented by a few small and poorly formed examples. The Graves oak (*Quercus gravesii*)-Texas pistachio (*Pistacia mexicana*) woodland, documented at a few sites in Amistad, is very rare in the United States, but more common in Mexico.

Conclusion

The vascular plant community of Amistad is highly diverse, though many areas are altered by the reservoir. The remaining plants are highly threatened by nonnative plant and animal species, e.g., free-ranging livestock and exotic wildlife. Nonnative plants thrive on the disturbance areas where the reservoir level rises and recedes. Several areas visited in Amistad during this survey are of interest. The Devil's River area upstream of Indian Cliffs Canyon and the wetland and upland canyon areas of Satan Canyon are unique to the area and uncommon globally. The plateau liveoak grove areas in Satan Canyon, Lowry Springs, Live Oak Creek, Seminole Canyon, and Oak Motte in Hunt Area 4 represent communities at the edge of their range and should be monitored. Oak mottes require fencing to exclude livestock, and removal of nonnative plants to ensure preservation.

Restoration through removal of nonnative species is warranted in areas such as the Graves oak-Texas pistachio woodland community in Pink Cave Cove, the upper portion of the Pecos River above the lake influence, and Amistad wetlands below the dam.

The resulting plant community list for Amistad is based on, generally, single site visits. A more intensive inventory effort involving multiple site visits will reveal greater confidence in a plant community list, and allow for greater knowledge and protection of the natural health of the park. Staff should become familiar with rare species that may be found within Amistad. Rare species documented in this study, such as cliff bedstraw (*Galium correllii*) and cliff thistle (*Cirsium turneri*), should be monitored annually.

Literature Cited

Poole, J.M. 2004. An inventory of the vascular plants at Amistad National Recreation Area. Wildlife Diversity Program, Texas Parks and Wildlife Department: Austin, Texas.

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