Conchas Lake
Vegetation Management Plan
December 2024

F

US Army Corps of Engineers.
Albuquerque District

This page intentionally left blank

Conchas Lake Vegetation Management Plan

1 Introduction 1
2 Goals & Objectives 1
3 Existing Conditions 2
3.1 Natural Resource Inventory 2
3.2 Ecoregion Setting 2
3.3 Soils 4
3.4 Vegetation 7
3.4.1 Vegetation Classification 7
3.4.2 Upland Vegetation 7
3.4.3 Riparian Vegetation 8
3.4.4 Wetlands 12
3.4.5 Invasive Species 14
3.5 Fire Management 14
3.6 Cultural Resources 15
3.6.1 Cultural Resource Laws and Processes 15
3.6.2 Archaeological Background 16
3.6.3 Culture History 16
3.6.4 Built Environment and Historic Properties 16
3.6.5 The Conchas Dam Historic District – Birthplace of the Albuquerque District: 16
3.6.6 The Conchas Lodge 16
3.6.7 Vegetation Treatment Methods and Historic Properties 17
4 Invasive Vegetation Treatment Methodology 17
4.1 National Pollution Discharge Elimination System: 18
4.1.1 General SWPPP Criteria: 18
4.1.2 Construction General Permit 18
4.1.3 Best Management Practices: 20
4.2 Pesticide General Permit 21
4.3 Disposal 22
4.4 Treatment Methodology 23
4.4.1 Manual Removal 23

4.4.2 Low Volume Basal Bark Herbicide Application 24
4.4.3 Cut-Stump Herbicide Application 25
4.4.4 Foliar Application 26
4.4.5 Mechanical Removal 27
4.4.6 Burn Treatment and other Alternative Treatment Methodology 29
5 Management by Habitat Type and Land Use 32
5.1 Shoreline Recreation Areas 35
5.1.1 South Campground Shore: 35
5.1.2 Ranger Station Cove: 36
5.1.3 Boat Launch Peninsula: 38
5.1.4 Juniper Day-use Area Shoreline and Conchas Lodge: 40
5.1.5 Cannon Cove: 41
5.2 Project Operations and Maintenance Areas covered under SPA Pesticide Use Plan 42
5.3 Project Operations and Maintenance Areas 44
5.3.1 Administrative Areas 44
5.3.2 Below Dam: 44
5.3.3 South Skirt Dam: 46
5.3.4 Irrigation Headworks: 47
5.4 Upland Recreation Areas and Wildlife Management Areas 48
5.4.1 Big Mesa/Highway 104: 48
5.5 Environmentally Sensitive Areas 50
5.6 Out-granted Areas 50
6 Restoration Practices 51
6.1 Planting Dormant Pole and Whip Cuttings 51
6.2 Container Plantings 52
6.3 Seeding 52
7 Vegetation Survey and Monitoring 54
7.1 Baseline Survey – Existing Conditions 54
7.2 Treatment & Monitoring Objectives 58
7.3 Restoration & Monitoring Objectives 62
8 References 66
9 Appendices 68

List of Figures

Figure 1: Project location within the Ecoregions of the southwestern USA. 3
Figure 2: Major Soil Types at the Conchas Dam and Lake Project 6
Figure 3: Vegetation subclasses within the Project boundary with permanent sampling plot locations. .. 9
Figure 4: Wetland classifications within the Project boundary 13
Figure 5: Treatment areas throughout Conchas Lake in relation to land use/classification. 33
Figure 6: Detailed view of Invasive Species Management Areas at Conchas Lake 34
Figure 7: South Campground Shore 35
Figure 8: Ranger Station Cove 37
Figure 9: Boat Launch Peninsula 39
Figure 10: Juniper Day Use Area and Lodge 40
Figure 11: Cannon Cove 41
Figure 12: Areas within Project boundary that are covered under a separate plan (Routine Vegetation Management Plan for Dam Safety) 43
Figure 13: Below Dam. 45
Figure 14: South Skirt Dam. 46
Figure 15: Irrigation Headworks. 47
Figure 16: Big Mesa/Highway 104. 49
Figure 17: Permanent Monitoring Plot locations overlayed on Land Use Classifications within Conchas Dam Fee Boundary 57

List of Tables

Table 1: Summary of the Project Vegetation Plan objectives. 1
Table 2: Major Soil Types and other characteristics within the Project. 5
Table 3: Vegetation classification of Project lands from Level 1 Inventory at the 1997 NVCS sub-class level. 8
Table 4: Land Use and Vegetation Classifications (Group, Alliance and Association descriptions from NatureServe 2024) 10
Table 5: Wetland Resources at Project 12
Table 6: Invasive Species Found at Project 14
Table 7: USACE Approved Herbicides 30
Table 8: Grass and forb species for seeding at Conchas Lake 53
Table 9: Field Maps App geospatial data collection (mapping) should be set up following this table to create drop down menus as described. 55
Table 10: Invasive Species Plan Treatment & Monitoring Objectives 59
Table 11: Plant Community Characteristics for Baseline Reference Sites 61
Table 12: Vegetation Restoration & Monitoring Objectives 63

This page intentionally left blank

1 Introduction

The Conchas Dam and Lake Project (Project) is a multipurpose water resources project constructed and operated by the U.S. Army Corps of Engineers (USACE), Albuquerque District. The lake and associated federal lands are in San Miguel County, New Mexico (NM). Conchas Dam is situated on the Canadian River in San Miguel County. The dam, its associated infrastructure, and lands acquired for the Project, are federally owned, and administered by the USACE.

The Project encompasses approximately 6,000 acres of water surface during a normal year, and approximately 3,413 acres of fee-owned land. The Conchas Dam project area is centered among a vast expanse of natural semiarid grassland and shrubland, primarily used as rangelands for cattle operations. Currently, much of the natural habitat at Project appears to be relatively intact. However, in recent years, the Project has become increasingly infested with invasive saltcedar (Tamarisk; *Tamarix* spp.), a class C noxious weed species in the state of New Mexico, as well as Siberian elm (*Ulmus pumila*) and Russian olive (*Elaeagnus angustifolia*). Management of vegetation is needed throughout the Project's footprint to control the spread of invasive species and to preserve and protect native habitat and historical landscapes.

An interdisciplinary team with USACE developed the Project Vegetation Management Plan (Plan) to guide the implementation of various management strategies aimed at meeting project objectives while conserving environmentally sensitive areas. The plan outlines recommendations for maintaining, utilizing, and restoring degraded habitats, which are crucial to achieving USACE's long-term vision for the site.

2 Goals & Objectives

The Plan is designed to identify and implement effective strategies that promote the health of upland, wetland, and riparian ecosystems of the USACE-owned land at the Project. The objectives of the Plan are summarized in Table 1 (objectives table).

Table 1: Summary of the Project Vegetation Plan objectives.

CN VEGETATION PLAN OBJECTIVES	DESCRIPTION
OBJECTIVE – 1	Preserve the native habitat mosaic that supports the diversity and abundance of native flora and fauna.
OBJECTIVE – 2	Identify and restore disturbed and degraded areas.
OBJECTIVE – 3	Manage the establishment and spread of invasive species and abate noxious weeds and other undesirable flora.
OBJECTIVE – 4	Establish management strategies that reduce the amount of standing dead woody vegetation and provide for firebreaks to help prevent and control the spread of catastrophic wildfires.
OBJECTIVE – 5	Preserve the aesthetic and historic character of the landscaping and viewsheds of the Project Office and Adobe Bell.

3 Existing Conditions

3.1 Natural Resource Inventory

In 2018, USACE completed a Level 1 Natural Resources inventory of Project lands. Per USACE requirements, the Level I Inventory consists of four components: soils, vegetation, wetlands, and special status species, including federally threatened, endangered, and candidate species, as well as species with state conservation status. This Plan will utilize and build upon the results of the Level 1 Inventory. Specifically, vegetation, which was categorized at a coarse level in the original Inventory, will be described in more detail in this plan.

3.2 Ecoregion Setting

Ecoregions are major land areas that share similar ecosystem characteristics, defined by geographically distinct flora and fauna species, natural communities, and environmental conditions including geology, landforms, soils, and climate. The Project is within the Southwestern Tablelands flank of the High Plains, a semiarid region of the southwestern USA characterized by broad, rolling plains, tablelands, and piedmonts.

The Southwestern Tablelands ecoregion (U.S Environmental Protection Agency, 2024) extends from east-central Colorado, east-central New Mexico, and small portions of northwest Texas, including the Oklahoma panhandle and south-central Kansas (Wiken, Jimenez Nava, &Griffith, 2011) (see Figure 1: project ecoregion). The ecoregion features a dry mid-latitude climate, marked by hot summers and cool winters. It is characterized by red-hued canyons, mesas, badlands, and dissected river breaks. Unlike most adjacent Great Plains ecological regions, the Southwestern Tablelands have minimal cropland, with much of the region's landcover consisting of semiarid rangeland. The eastern boundary represents a transition from the more extensive cropland within the High Plains to the generally more rugged and less arable land within the Southwestern Tablelands ecoregion.

The ecoregion supports a wide variety of vegetation types, with a mix of prairie, savanna, and open woodland, dominated by shrubs, grasses, forbs, and small trees. Depending on the soil type, the vegetation mosaic varies from shortgrass to midgrass prairie patches with a juniper-scrub, oak-scrub and mesquite-savanna component. However, the predominant vegetation of the region, particularly in the vicinity of Conchas Lake Project, is characterized by shortgrass and midgrass prairie, with grasses such as blue grama (*Bouteloua gracilis*), black grama (*B. eriopoda*), sideoats grama (*B. curtipendula*), buffalograss (*B. dactyloides*), sand dropseed (*Sporobolus cryptandrus*), alkali sacaton (*S. airoides*), threeawns (*Aristida* species), little bluestem (*Schizachyrium scoparium*), western wheatgrass (*Pascopyrum smithii*), ring muhly (*Mulhenbergia torreyi*), and galleta (*Pleuraphis jamesii*). Common shrubs in the ecoregion include sand sagebrush (*Artemisia filifolia*), broom snakeweed (*Gutierrezia sarothrae*), and fourwing saltbush (*Atriplex canescens*). Shrubby succulents such as yucca (*Yucca* species) and cacti (Cactaceae) including cholla (*Cylindropuntia imbricata*) also occur. Within the ecoregion there are also areas of pinyon pine (*Pinus edulis*), juniper species (*Juniperus*), scrub oaks (*Quercus*), and some escarpments with juniper, skunkbush sumac (*Rhus trilobata*), and mountain mahogany (*Cercocarpus* species). (Note, not all of these species are present at the Project, and numerous additional species were identified during vegetation sampling for this management plan.)

Prairie fires were likely an important component in maintaining the region's grasslands and suppressing encroachment of trees, shrubs, and other woody species.

Riparian woodlands in this ecoregion are characterized by cottonwood (*Populus* species, specifically *Populus deltoides* in the Conchas Lake area), willow (*Salix* species), elm (*Ulmus*), and hackberry (*Celtis*). The major watersheds of the region include the Pecos, Conchas and a small portion of the Canadian rivers. Aside from these major rivers, most of the region's streams are intermittent or ephemeral. The region's topography consists of mostly broad, rolling plains, piedmonts, and elevated tablelands dissected by canyons, mesas, badlands, and river breaks (Wiken, Nava and Griffith, 2011). Soils of the ecoregion include loess, windblown sand, alluvium, or colluvium, formed in material primarily from Quaternary, Triassic and Permian sediments.

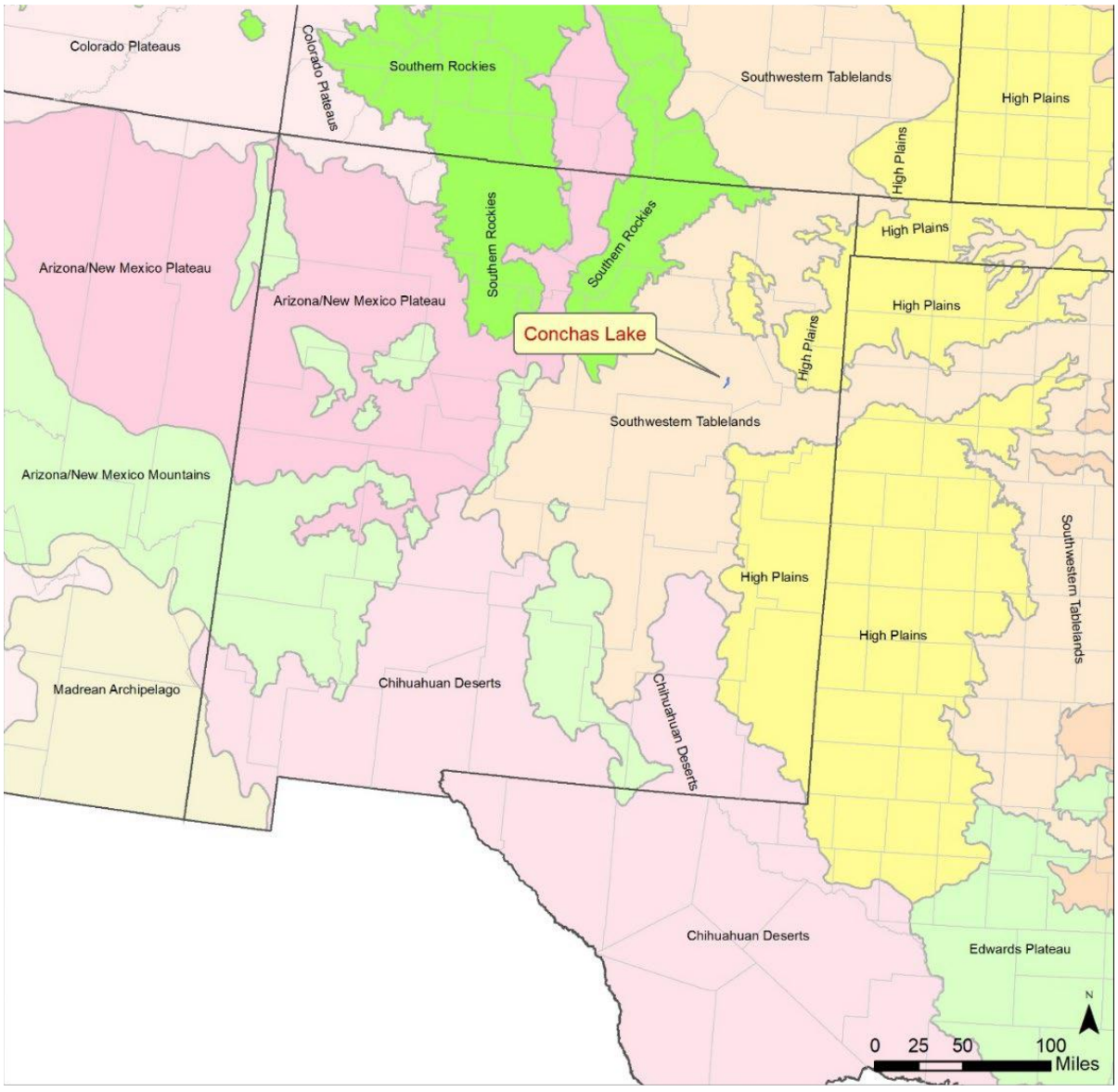


Figure 1: Project location within the Ecoregions of the southwestern USA.

3.3 Soils

There are five major soil types occurring within Project, excluding areas inundated by water and the dam footprint. Soils formed in material primarily from Quaternary, Triassic, and Permian sediments. The most abundant soil types in the Project easement are Conchas-Latom association and Latom-Newkirk-Rock outcrop association. These two soil types combined encompass 2,191.84 acres (72%) of Project fee-owned lands. A description of the major soil types is summarized in Table 2 (major soil type description) and Figure 2 (maps of major soil types) represents the spatial extent of the different soil types within the Project footprint.

Table 2: Major Soil Types and other characteristics within the Project.

Soil Type Code	Soil Type	% of Project Area	Landscape Location	Description	Potential Plant Community
CK	Conchas-Latom association	39.21 %	Uplands, Benches	• This soil type occurs on uplands, is vegetated mainly with grasses, and has slope ranging from 1 to 9 percent. • Conchas soil is moderately deep and well drained, permeability is moderately slow, and available water capacity is moderate. The hazard of soil blowing is moderate. • Latom soil is very shallow and well drained. Permeability is moderate, available water capacity is very low, and effective rooting depth is 8 to 20 inches. Runoff is medium, and the hazard of soil blowing is high. Latom soil is used for livestock grazing and wildlife habitat.	• The potential plant community on the Conchas soil is mainly blue grama, black grama, galleta, and sideoats grama. • The potential plant community on the Latom soil is mainly sideoats grama, blue grama, black grama, and little bluestem.
LN	Latom-Newkirk-Rock association	33.49 %	Ridges	This soil type occurs on gently undulating to moderatly rolling, well-drained soils that formed from material weathered from sandstone and shale on uplands.	• The potential plant community is mainly sideoats grama, black grama, blue grama, and little bluestem
MF	Montoya-Tucumcari association	12.33 %	Flood-plains & Depressions	The Montoya soil occurs on floodplains, while the Tucumcari soils are found on alluvial fans. Slope is 0-3% and the vegetation is mainly grasses. The Montoya soil is deep and well drained, permeability is very low and available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is high. The hazard of soil blowing is high.	• The potential plant community on the Montoya soil is mainly alkali sacaton, tobosa, blue grama, and vine-mesquite.
RE	Redona-Quay association	11.43 %	Fans	Occurs on fans and uplands. Slope is 0-5 percent. The vegetation is mainly grass. The Redona soil is on fans, and the Quay soil is on fans and low ridges. Redona soil is deep and well drained with moderate permeability. Available water capacity is very high. Effective rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.	• The potential plant community on the Redona soil consists mainly of blue grama, yucca, galleta, and vine-mesquite.
BA	Badland	3.53 %		Steep or very steep, non-stony barren lands dissected by mainly intermittent drainage channels. Runoff potential is very high, and geologic erosion is active. Slope is 0 to 65%. Included in this unit are small areas of Lacita soils on fans, Latom soils on benches, and Montoya soils on erosional remnants. The unit is used for wildlife habitat.	The potential vegetation is mainly sparse grasses.

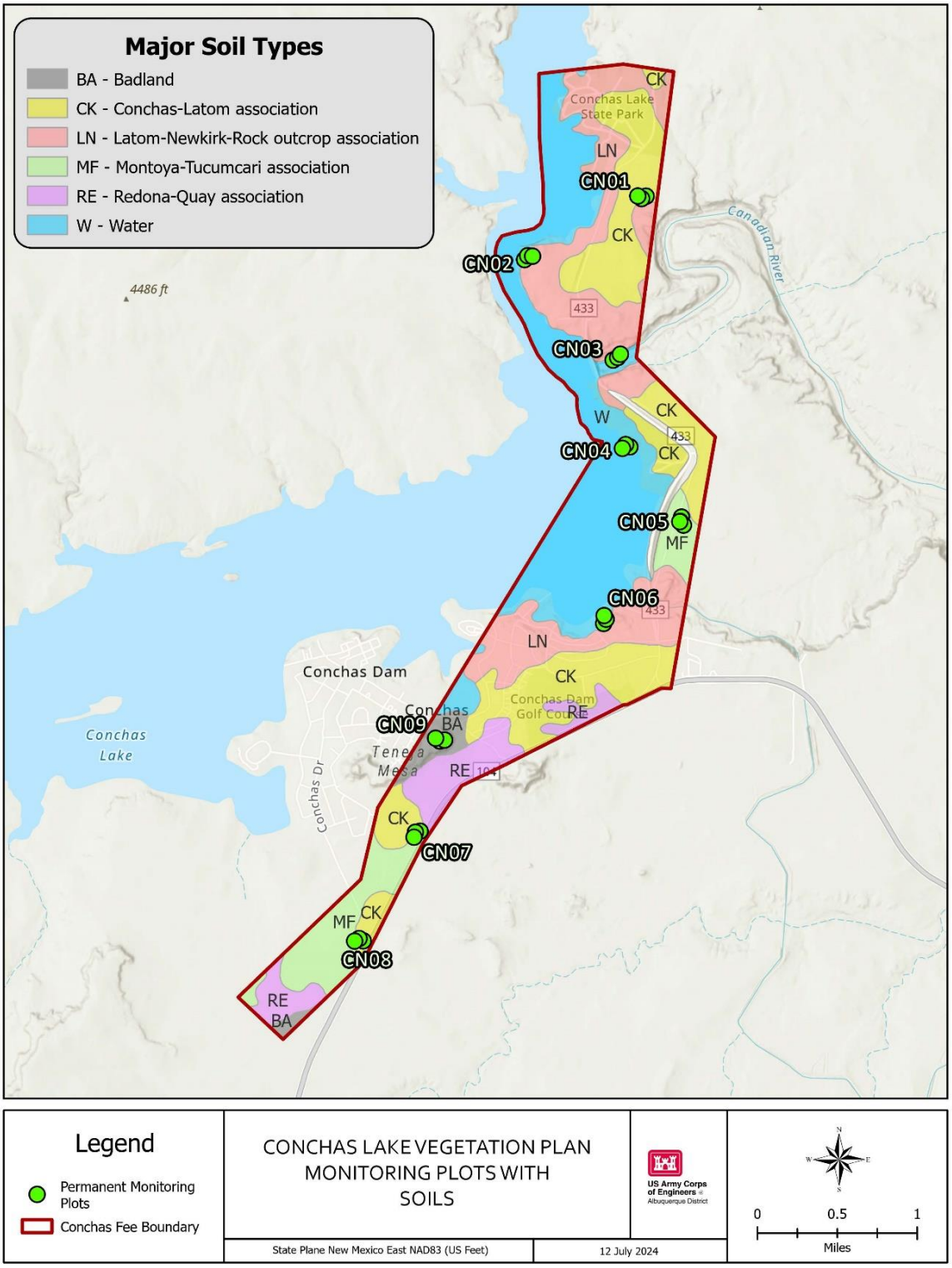


Figure 2: Major Soil Types at the Conchas Dam and Lake Project

3.4 Vegetation

3.4.1 Vegetation Classification

The U.S National Vegetation Classification (USNVC) is a comprehensive classification system for all vegetation types in the United States, providing a framework for the effective management and conservation of plant communities. The USNVC offers a hierarchy of classification levels from coarse to fine, with the upper (coarse) levels based on growth forms and global ecological drivers, and the lower (fine) levels based on regional species, growth forms, and floristics (local species composition).

The vegetation classification used by USACE for Level 1 Inventory purposes was based on the original 1997 National Vegetation Classification System (NVCS), and only a coarse level ("vegetation subclass") was used to categorize plant communities. Thus, the Level I inventory is not very effective for vegetation management because only growth forms, not species, were used to describe plant communities. In 2008, the current, dynamic USNVC standard was approved, and a second version of the USNVC was released in 2016 ("History", U.S. National Vegetation Classification 2024). The 1997 NVCS had seven levels whereas the current USNVC uses eight levels ("Natural Vegetation Classification", USNVC 2024). Therefore, the vegetation types used for the USACE Level I Inventory, which were only categorized at a course "vegetation subclass" level (based on general climate and plant types), do not correspond well to plant communities we describe here based on 2023 vegetation sampling, which emphasizes floristics (plant species). The classification of vegetation at subclass level is summarized in Table 3 and illustrated in Figure 3. Plant community descriptions in the current USNVC were obtained from NatureServe (2024).

3.4.2 Upland Vegetation

The shortgrass prairie is a plant community dominated by blue grama, buffalograss, and black grama and lesser amounts of forbs and shrubs unevenly distributed across the landscape.

The mesquite-grassland community at Conchas is characterized by mesquite growing in clusters or open-canopied stands. Honey mesquite (*Prosopis glandulosa*) is native to eastern NM; however, its density has increased over time due to grazing concentrated on grass plants and fire suppression following settlement. Mesquite exerts a profound influence on neighboring vegetation, soils, subcanopy microclimate, wildlife use, and insect populations. High densities of mesquite suppress grass growth and can reduce understory species diversity. In the vegetation monitoring plots that had a mesquite overstory (CN01, CN05, CN06, CN07, CN08, and CN09), mesquite was present in sparse to open canopied stands and other shrubs were present at low density, including littleleaf sumac (*Rhus microphylla*), *Yucca glauca*, featherplume (*Dalea formosa*), and fourwing saltbush (*Atriplex canescens*). Dominant grasses included black grama, galleta, alkali sacaton, and lesser amounts of blue grama, ring muhly, Plains bristlegrass (*Setaria leucopila*), and slim tridens (*Tridens muticus*).

The juniper community at the Project is found on rocky outcrops and areas of broken rocky land. Junipers were encountered in plots CN02 and CN06. These areas also had higher diversity of grasses, forbs, and shrubs, perhaps because the rock creates a variety of microclimates and shelters plants from competition and grazing/browsing.

Table 3: Vegetation classification of Project lands from Level 1 Inventory at the 1997 NVCS sub-class level.

Land Cover/Vegetation Type	Acreage
Temperate & Boreal Shrubland & Grassland	1,940.5
Warm Semi-Desert Scrub & Grassland	93.8
Temperate Forest	46.3
Cool Semi-Desert Scrub & Grassland	10.6
Semi-Desert Nonvascular & Sparse Vascular Vegetation	0.2

3.4.3 Riparian Vegetation

The NVCS sub-class level that was used for Level I inventory does not provide data for riparian vegetation communities. The riparian communities fell into the Temperate Boreal Shrubland and Grassland using the NVCS sub-class level. However, a New Mexico Riparian Vegetation (NMRIP) classification is available (Muldavin et al. 2021) that categorizes three hierarchical levels of riparian vegetation. Riparian vegetation occurs along the Canadian River from the outflow of the dam and continues along the river to the Project boundary, and also along the shoreline of Project.

Saltcedar (*Tamarix* sp.), a non-native shrub/tree, has become well established throughout the riparian areas of Project and the Canadian River. These areas are classified within the Western Arid Ruderal Lowland Riparian Forest & Scrub ecological system in the NVCS. In NMRIP, they are classified as Saltcedar Introduce Riparian Woodland and Scrub when stands consist almost entirely of saltcedar, with very few native plants intermingled. When stands are a mixture of native and non-native species-often saltcedar with a native understory-they are classified as Lowland Native-Introduced Saltcedar Riparian Scrub. Native stands of Coyote willow (*Salix exigua*) mixed with rushes and grasses occur with saltcedar along the Canadian River as well as along some of the lake's shorelines.

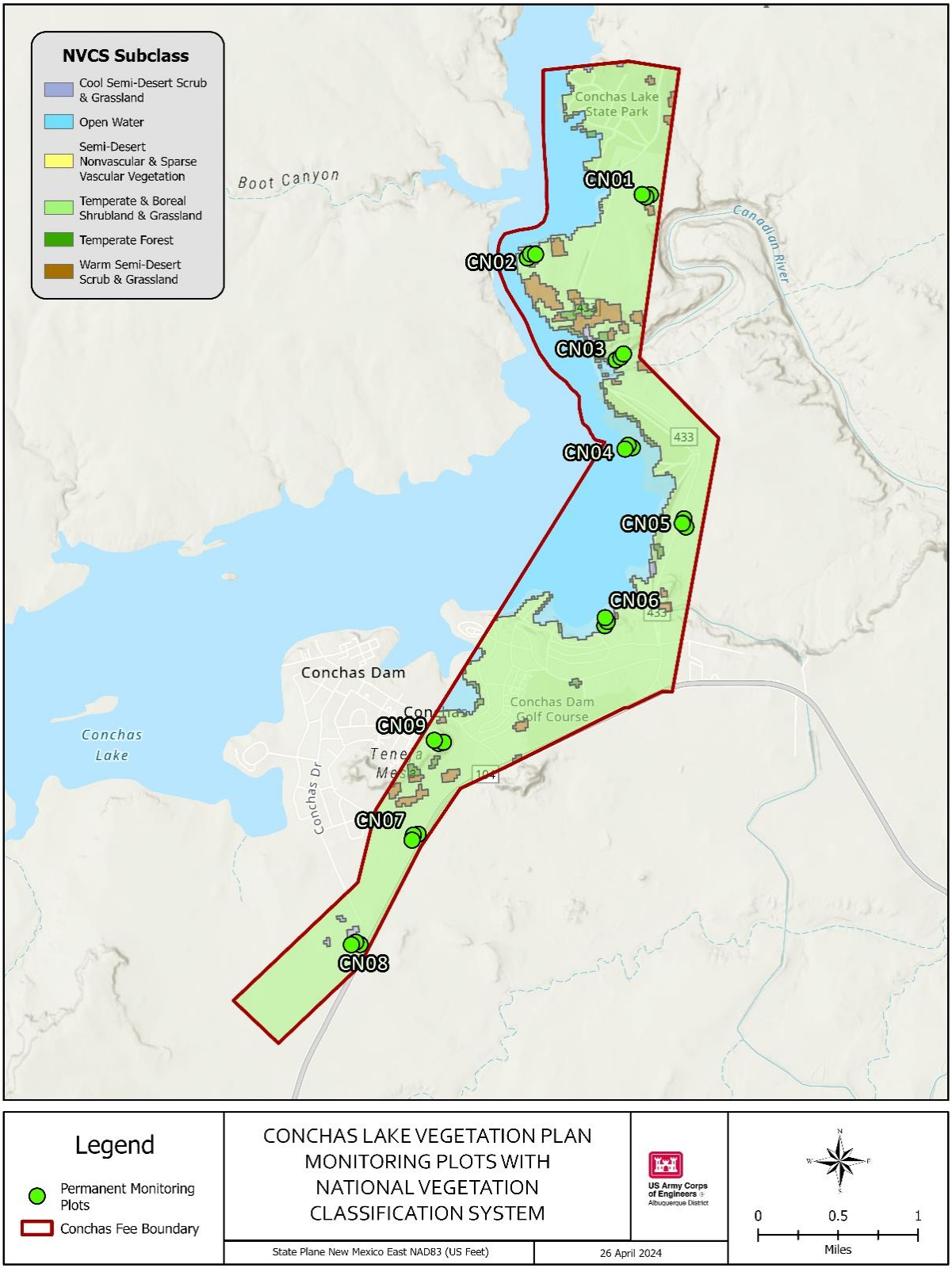


Figure 3: Vegetation subclasses within the Project boundary with permanent sampling plot locations.

Table 4: Land Use and Vegetation Classifications (Group, Alliance and Association descriptions from NatureServe 2024)

LAND USE	NR LEVEL 1 - VEG CLASS (old: Sub-class; current- Formation)	**Updated* VEG CLASS Group, Alliance or Association	Observed Habitat	NUMBER OF PLOTS	General Location	Plot Name
High Density Recreation	Temperate & Boreal Shrubland & Grassland	Southern Rocky Mountain Juniper Open Woodland	Rocky Outcrop Juniper Stands		NMSP North/Bell Point, rocky bluffs above lake shore	
	Temperate & Boreal Shrubland & Grassland	Western Great Plains Mesquite Scrub Woodland and Shrubland	Mesquite savanna/ shrubland		NMSP North/Bell Point, uplands inland from the lake	
	Temperate Forest/Wet salt Meadow	Open Channel Riverwash/Water/Unvegetated Bars (NMRIP). (No described NVCS class.)	Shoreline fluctuations	1	Central	CN04
	Temperate Forest/Wet salt Meadow	Western Arid Ruderal Lowland Riparian Forest & Scrub	Saltcedar		Cannon Cove, Boat Ramp Peninsula, S. Campground Shore (see Figure 6)	
Low Density Recreation	Temperate & Boreal Shrubland & Grassland	*Juniperus monosperma* Grassy Woodland Alliance; Great Plains Lowland Salt Meadow and Dry Grassland (NMRIP)	Rocky Outcrop Juniper sparse shrubland (modified- previously inundated)	1	Southside	CN06
	Temperate Forest	Western Arid Ruderal Lowland Riparian Forest & Scrub	Saltcedar		Near CN09 in Fig. 3	
Project Operations	Temperate & Boreal Shrubland & Grassland	Western Great Plains Mesquite Scrub Woodland and Shrubland Ecological System (invaded by saltcedar at this location).	Lowland Native-Introduced Mesquite-Saltcedar Riparian Scrub /dry shrub and grassland	1	Embankment toe drain; South Skirt Dam	CN05
	Warm Semi-Desert Scrub & Grassland	Blue Grama - Galleta Semi-Desert Grassland Association	Dry mesquite shrub and grassland	1	Dam Operations, east of emergency spillway	CN01
	Riparian	Great Plains Freshwater Marsh (invaded by *Tamarix*)	Perennial wet marsh / wet meadow (Seasonally inundated)	1	Stilling Basin	CN03 – not sampled

Environmentally Sensitive Area	Temperate & Boreal Shrubland & Grassland	Honey Mesquite / Exotic Grass Ruderal Shrubland (*note: although named ‘exotic grass’, this association has native blue grama as its most prevalent grass).	Dry mesquite shrub and grassland	1	Southern Mesa Top	CN09
	Warm Semi-Desert Scrub & Grassland	One-seed Juniper shrubby woodland, One-seed Juniper/ Rockland Woodland or One-seed Juniper/ Black Grama Open Woodland	Dry juniper shrub and grassland	1	Boy Scouts area	CN02;
Wildlife Management Area	Temperate & Boreal Shrubland & Grassland	Southern Great Plains Shortgrass Prairie	Grassland			
	Cool Semi-Desert Scrub & Grassland	Blue Grama - Galleta Semi-Desert Grassland Association	Dry shrub and grassland			
	Warm Semi-Desert Scrub & Grassland	James' Galleta Grassland (CN07); Honey Mesquite / Black Grama Ruderal Shrub Grassland (CN08)	Mesquite shrub and grassland	2	Saddle Dam Area	CN07, CN08

3.4.4 Wetlands

Waters of the United States are defined within the Clean Water Act (CWA), and jurisdiction is addressed by USACE and the United States Environmental Protection Agency (EPA). Wetlands are a subset of the waters of the United States that may be subject to regulation under Section 404 of the Clean Water Act (CWA) (40 CFR 120.2). Wetlands are those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. For natural resource management and inventory purposes at operational USACE projects, USACE uses the National Wetlands Inventory (NWI) maintained by the USFWS. Table 5 lists the different wetland types and locations near Project, and Figure 4 illustrates the wetland classes on federal fee-owned lands at Project.

Table 5: Wetland Resources at Project

Wetland Types	Total Acres
Lacustrine Limnetic Open Water	606.67
Lacustrine Littoral Open Water	559.28
Lacustrine Open Water	29.47
Palustrine Open Water	3.42
Riverine	1.98
Total Inventoried	1,200.82

Note: Acreages from the USFWS website do not match exactly with the USACE digitized acreages. Acreages provided in this table reflect only acreage that is owned in fee by USACE.

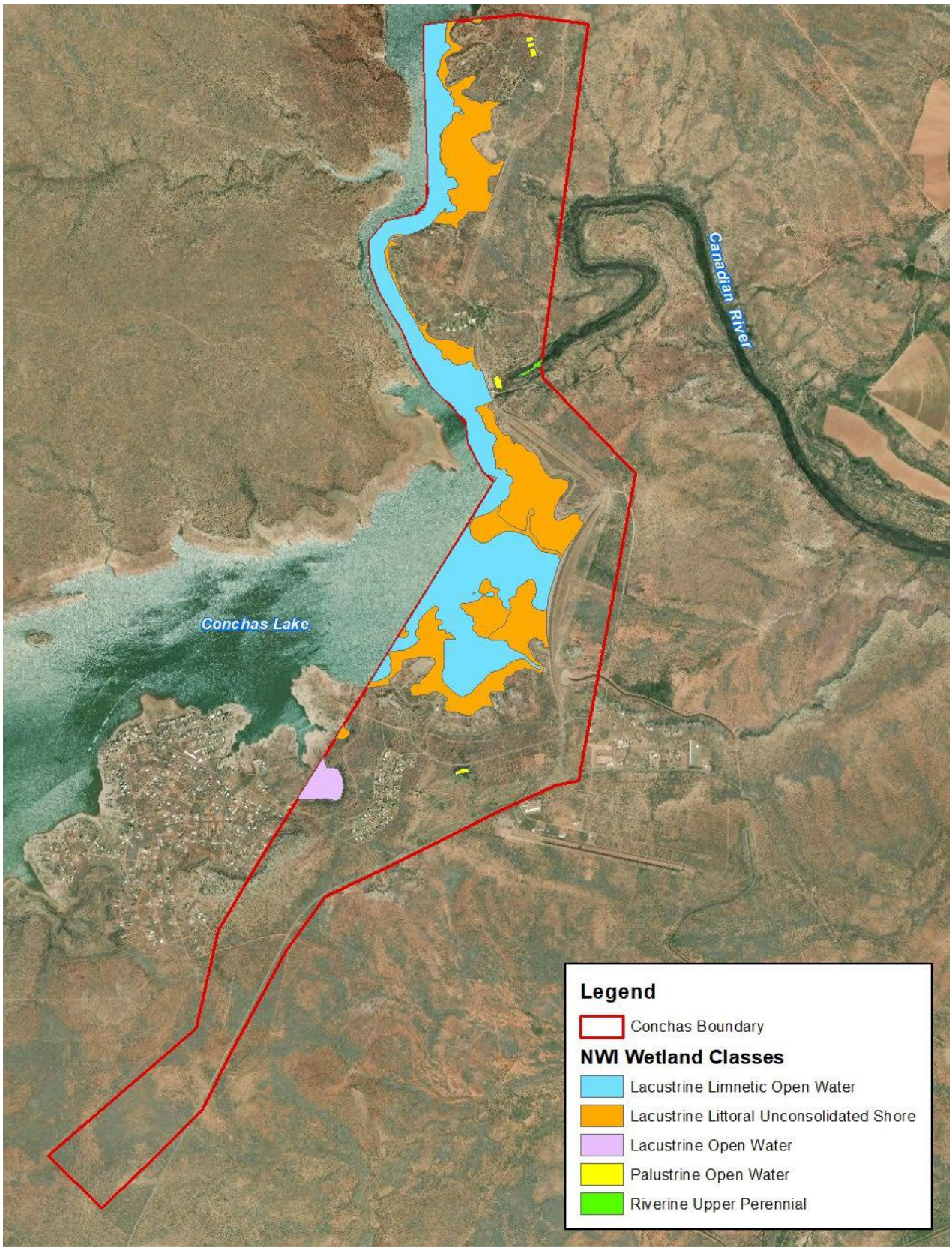


Figure 4: Wetland classifications within the Project boundary

3.4.5 Invasive Species

An invasive species is a non-native organism which, if uncontrolled, causes harm to the environment, economy, or human health. Invasive species generally grow and reproduce quickly and spread aggressively. Non-native, or exotic, species have been introduced, either intentionally or unintentionally, and can out-compete native species for resources or otherwise alter the ecosystem. Aggressive, native species are those species that spread aggressively due to an alteration in the ecosystem, such as lack of fire or the removal of a predator from the food chain. Table 6 lists invasive non-native species that occur at Project identified by NMDGF and USACE.

The project is situated in an area with low urbanization; therefore, maintaining habitat continuity is of the highest priority. Conchas Dam attracts high amounts of diverse wildlife and should be managed to promote and maintain the highest availability of quality habitat to reduce impacts to the natural environment from habitat fragmentation and variability in land use patterns.

A significant fraction of the Conchas project area is infested with invasive saltcedar (*Tamarix* spp.), a class C noxious weed species in the state of New Mexico, as well as Siberian elm (*Ulmus pumila*) and Russian olive (*Elaeagnus angustifolia*). Active management of these undesirable plant species is critical to ensuring the health of native plant communities to promote sustainability and persistence of high-quality native wildlife habitat and proper ecosystem functioning. Saltcedar alters the ecology and hydrology of native riparian systems and generally diminishes habitat quality (Tamarisk Coalition, 2014). Leaf drop from saltcedar increases soil salinity and lessens microbial activity. Evapotranspiration rates for saltcedar are higher than native riparian species which may reduce stream flows; soils also become drier under dense stands. Saltcedar is common along disturbed and undisturbed streams, riverbanks, desert springs, flood plains, drainages, and irrigation waterways. A persistent commitment over many years is required for successful control of saltcedar. Failure to properly manage wildlife habitats which consist of healthy native plant communities will result in the loss of biodiversity; habitat degradation will lead to the increased presence of undesirable species and environmental conditions that may be injurious and detrimental to human health and sustainability. Managing vegetation and fostering healthy native plant communities will improve and maintain high quality wildlife habitat.

Table 6: Invasive Species Found at Project

Common Name	Scientific Name	Prevalence
Saltcedar (Saltcedar)	*Tamarix* spp.	Significant/Major
Russian Olive	*Elaeagnus angustifolia*	Moderate
Russian Thistle	*Salsola* spp.	Minor
Canada Thistle	*Cirsium arvense*	Minor

Source: USACE

3.5 Fire Management

Currently, the Project does not have a Fire Management Plan or a Controlled Burn Plan. However, several dirt roads are maintained throughout the Project area which serve as firebreaks. These roads

provide the fire department with access to the more remote parts of the Project. The Project plans to pursue the development of a Fire Management Plan and/or a Controlled Burn Plan in the future.

3.6 Cultural Resources

As with most Corps lakes, Conchas Lake contains a large number of significant archaeological resources representing thousands of years of human occupation. In addition to archeology, some of the most significant historic properties at Conchas include Corps facilities themselves. The Conchas Dam Historic District is listed on the National Register of Historic Places, and other elements of the built environment (such as Conchas Lodge) are historically significant as well.

As a federal agency, numerous laws, regulations, and policies govern Corps management of cultural resources and historic properties. Compliance with Section 106 of the National Historic Preservation Act (NHPA) in conducting routine operations and maintenance undertakings at Conchas Lake (as well as other facilities in New Mexico and Colorado) is currently governed by a programmatic agreement (PA) between the Albuquerque District, the State Historic Preservation Officers (SHPOs) of New Mexico and Colorado, and the Tribal Historic Preservation Officer (THPO) of Santa Ana Pueblo.

3.6.1 Cultural Resource Laws and Processes

A large body of federal legislation, regulations, and executive directives outline the responsibilities and procedures of federal agencies for management of cultural resources on federally owned or controlled lands and properties. Among the most important is the National Historic Preservation Act (NHPA), especially sections 106 and 110.

Section 106 of the NHPA requires that federal agencies consider the effects of all undertakings on cultural resources listed in, or eligible for listing in, the NRHP at the planning stage. “Undertakings” are defined in the NHPA as any activity involving federal action, funding, approval, or permission. The process is outlined in implementing regulation 36 CFR § 800 (Protection of Historic Properties), which requires consultation with consulting parties such as State Historic Preservation Officers (SHPOs), Tribal Historic Preservation Officers (THPOs), Native American tribes, local governments, applicants for federal permits or licenses, and the public, including individuals and organizations with a demonstrated interest in the outcome of any undertaking.

The implementation of this vegetation management plan constitutes an undertaking under Section 106. The 36 CFR § 800 regulations define the consultation process, but this process may be modified by a programmatic agreement (PA). As of this writing, Section 106 compliance at Conchas Lake is governed by a PA executed on 21 November 2024, which streamlines and modifies the consultation process for routine operations and maintenance activities. As of this writing, USACE is in the process of negotiating amendments to the PA, which include standard procedures for vegetation clearing projects that may be applicable to the activities described in this plan. In addition, a USACE Engineer Pamphlet (EP) and Engineer Regulation (ER)—EP-1130-2-540 and EP-1130-2-540. ER-1130-2-540 – provide additional regulations and guidance on USACE stewardship of historic properties under its management and control.

In addition, section 110 of the NHPA requires federal agencies to develop preservation programs in order to effectively manage historic properties under their care. Section 110 requires that all historic properties under Federal control be managed with respect to their historic values and managed or maintained to prevent deterioration. Each agency must ensure that no potentially eligible historic

property is inadvertently transferred, sold, demolished, substantially altered, or allowed to significantly deteriorate without prior compliance and mitigation of adverse effects.

3.6.2 Archaeological Background

With the exception of areas that were inundated at the time of survey, all Corps fee land at Conchas Lake has been subjected to intensive archaeological survey in recent years, including a survey of the South Campground (Turnbow and Cribbin, 2008) and a recent survey of 1,899 acres (Brown, 2014). A total of 65 archaeological sites have been identified on Corps fee land. These include both prehistoric sites dating over the span of several thousand years, and post-contact and historic sites including sites associated with the construction of Conchas Dam itself. In addition, numerous archaeological sites are located on Corps easement lands. All of these sites have the potential to be impacted by Corps actions, and those impacts must be considered in any Corps undertaking.

3.6.3 Culture History

Conchas Dam is located at the confluence of the Canadian and Conchas Rivers and prehistoric and historic peoples have used these easterly flowing rivers as routes between the Rio Grande and the Plains for thousands of years. In general, the archaeological chronology can be divided into four major time periods: Paleoindian, Archaic, Ceramic, and Historic, ranging in age from the earliest documented presence of humans in the area approximately 12,000 years ago to the present. A summary of the archaeological and cultural history of the area may be found in the Master Plan.

3.6.4 Built Environment and Historic Properties

In addition to the 65 archaeological sites on Corps fee land, Conchas Lake contains and manages a number of significant historic properties, including some constructed by the Corps itself: namely, the Conchas Dam Historic District (including the Dam itself, as well as the administration area and Adobe Belle housing units) and the Conchas Lodge.

3.6.5 The Conchas Dam Historic District – Birthplace of the Albuquerque District:

Conchas Dam was one of a number of Depression-era New Deal projects completed in New Mexico and was the birthplace of what became the Albuquerque District of the Army Corps of Engineers. Supported by Governor Clyde Tingley, the project started in 1935 under Roosevelt's Emergency Relief Appropriation Act. Captain Hans Kramer of the Corps, who relied on 90% of his employees coming from relief roles, most without construction skills, oversaw all facets of the project. Construction was completed in 1939.

Together the dam, including all associated earthworks and other components, and the administration area, including the administration building and the Adobe Belle housing units, form the Conchas Dam Historic District. This district was listed on the State Register of Cultural Properties on April 7, 2000 (HPD No. 1791), and on the National Register of Historic Places on May 22, 2005 (NMHPD 2006; Schelberg and Stone 2005; Schelberg and Everhart 2000). A preservation and maintenance plan for the Conchas Project Office/Administration Building and the associated residence housing was prepared for the Corps by Van Citters (2001). The district is eligible for National Register listing based on its association with the numerous programs of the New Deal, as well as for its significant and distinctive engineering, construction methods, and architecture.

3.6.6 The Conchas Lodge

The Conchas Lodge, constructed by the Civilian Conservation Corps (CCC) in 1942, is a historic property eligible for NHRP listing due to its associations with patterns of recreational development

related to Conchas Dam, as well as being an important architectural example of Depression-era Federal make-work programs blending vernacular architectural language with contemporary features. Melvin L. Faust, who designed the Lodge, imparted both Pueblo and Spanish territorial influences in his design. The lodge was executed with fine sandstone bearing walls and wood craftsmanship consistent with the nation's body of New-Deal era buildings. In addition, the Lodge played an important role in the life of the local community.

3.6.7 Vegetation Treatment Methods and Historic Properties

The majority of the areas designated for vegetation clearing within this plan are located outside the boundaries of archaeological sites or other historic properties. For those areas, there is no limitation on the techniques used for managing vegetation within those areas; any of the methods described in this plan may be used at the discretion of Project personnel.

This plan describes in detail the known areas to undergo treatment, with each being discussed individually and showing polygons on maps. Specific restrictions or best practices for protecting historic properties are outlined in these individual descriptions.

In areas without historic properties, specific proposed work has been cleared under Section 106 using terms of the PA, either through application of exemptions or through "no historic properties affected" determinations. These determinations are documented under the normal PA process, as well as in the associated Environmental Assessment (EA). In addition, in areas that have already been surveyed for cultural resources, the Plan allows more generally for the use of any methods outside of documented archaeological sites and historic properties, and for restricted methods (including use of hand tools) within known archaeological sites. Only shoreline areas below the elevation of 4,172 feet may not have been surveyed due to water levels during survey; any work in those areas will need to be evaluated by an archaeologist (per the terms of the PA) prior to implementation of work in those locations.

Any staging areas, burn pile areas, and/or other areas involving use and staging of heavy equipment, must be outside of any archaeological site boundaries or in previously disturbed areas, as determined by a professional archaeologist under the terms of the PA.

Section 106 consultation was conducted for this plan, with consultation letters sent to the New Mexico SHPO and to Tribes with interests in the Conchas Lake area on November 1, 2024. If any future work is contemplated that does not meet the restrictions and descriptions contained in this plan, additional compliance work must be completed before implementation.

4 Invasive Vegetation Treatment Methodology

As mentioned in Section 3.4.5, the primary invasive species at the Project is saltcedar (*Tamarix spp*.). Of secondary concern are Siberian Elm (*Ulmus pumila*) and Russian olive (*Elaeagnus angustifolia*). This section outlines the qualifications for when work requires permits, guidelines and best management practices for recommended treatment types, disposal practices, and approved herbicides when necessary for treatment. The various treatment and control methods recommended to be implemented are as follows: 1) Manual; 2) Low Volume Basal Bark Herbicide Application; 3) Cut-Stump Herbicide Application; 4) Foliar Application; 5) Mechanical Removal; and 6) Burn Treatment and other Alternative Treatment Methodology.

During each phase of the Project, it will be ensured the proper environmental compliance and associated permits are obtained prior to commencement of work. This requires the coordination and

planning between the respective Project Offices: Support Branch (ODS), Environmental Resources (PMLE), Environmental Engineering (ECGE), and General Engineering (ECEC).

4.1 National Pollution Discharge Elimination System:

Treatment for each management area may trigger the need for a Stormwater Pollution Prevention Plan (SWPPP) under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) requirements of the U.S. Environmental Protection Agency (USEPA). The determination for a SWPPP will be considered by management area.

4.1.1 General SWPPP Criteria:

This section provides general guidance to support decision-making for a SWPPP. For expanded SWPPP information, please see the CGP subsection below.

If ground disturbance is less than one acre, then USACE will ensure all Best Management Practices (BMP) are in place and no SWPPP is required. See Section 4.1.3 for general BMPs.

If ground disturbance is greater than one acre and less than five acres, and the rainfall erosivity factor calculation is less than five [Rainfall Erosivity Factor Calculator for Small Construction Sites (USEPA LEW, 2024)], then USACE may file for a Low Erosivity Waiver (LEW). USACE would need to provide the supporting documentation on this before requesting the LEW. An LEW exempts the project from SWPPP requirements, but still would show proper EPA documentation/compliance.

If the ground disturbance is greater than one acre and the threshold of the rainfall erosivity factor is greater than five, then a SWPPP will be required.

4.1.2 Construction General Permit

NPDES CGP is required if construction activities will disturb one or more acres of land or will disturb less than one acre of land but are part of a common plan of development or sale that will ultimately disturb one or more acres of land or have been designed by the USEPA as needing permit coverage under 40 CFR 122.26(a)(1)(v) or 40 CFR 122.26(b)(15)(ii). CWA Section 402, 40 CFR § 122.26(b)(14)(x) and 40 CFR § 122.26(b)15)(i) NPDES permitting regulations authorize the discharge of stormwater from large and small construction activities in areas upland from a waterbody and not considered a jurisdictional wetland area, regardless of the land's designation as federal, state, Indian county or private. According to the National Wetlands Inventory, all areas below the OHWM are designated as wetland areas (https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/). Actions taken to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, grubbing, cutting, and filling), soil compaction, and movement and stockpiling of topsoils) are considered earth-disturbing activities by USEPA. The use of heavy equipment to cut above ground biomass and or to remove root balls are considered earth disturbing activities. If these activities are prescribed, a site-specific SWPPP will be developed by a Contractor in accordance with Section 7 of the CGP prior to submitting a Notice of Intent (NOI) for coverage under the CGP. After which, the Contractor will prepare and submit the NOI for coverage under the CGP using the USEPA's NPDES eReporting Tool (NeT). The NOI will be certified by the Contractor. Unless a temporary road is created, off-road driving, firebreaks, or any routine maintenance as described in 40 CFR 122.26(b)(15)(i) does not constitute a SWPPP.

The Contractor is responsible for inspections, which can be achieved by visiting the site once every seven days or once every 14 calendar days and within 24 hours of a storm event that produces 0.25 inches of rain or a snowfall event greater than 3.25 inches within a 24-hour period. During periods of

seasonal dryness or drought-stricken areas, the frequency can be reduced to once per month and within 24 hours of the occurrence of a storm event that produces 0.25 inches of rain or more within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period. All deviations must be documented in the SWPPP. Using the USEPA's Seasonally Dry Period Locator Tool (USEPA Tools, 2024), it was determined that December through February is considered seasonally dry at Conchas Lake and the inspection frequency will be reduced during this period. One month prior to construction activities SPA will determine if the location is considered drought-stricken (i.e., "Drought to persist or intensify", (2) "Drought ongoing, some improvement", (3) "Drought likely to improve, impacts ease", or (4) "Drought development likely") using the National Oceanic and Atmospheric Administration's U.S. Seasonal Drought Outlook (NOAA, 2024) and eligible for additional reductions in site visit frequency. A qualified person, as defined in Part 4.1, must conduct the inspections.

The Project Office is responsible for maintenance and corrective actions and associated reporting activities, in accordance with Parts 4 and 5 of the CGP. The Project Office is also responsible for achieving all conditions for terminating CGP coverage (Part 8.2), which include the requirements for final vegetative or non-vegetative stabilization (Part 2.2.14); either ground or aerial photographs that show the site's compliance with the Part 2.2.14 stabilization requirements; remove and properly dispose of all construction materials, waste and waste handling devices, and have removed all equipment and vehicles; remove all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following your termination of permit coverage or those that are biodegradable; remove potential pollutants and pollutant-generating activities associated with construction. This information will be compiled and submitted to the Contractor, who will then prepare and certify the Notice of Termination (NOT).

However, if the project's area of disturbance is less than five acres and the rainfall erosivity factor calculation ("R" in the Revised Universal Soil Loss Equation) is less than five the project is eligible for a small construction waiver or LEW. The operator (i.e., SPA) must certify to USEPA that construction activity will occur only when the rainfall erosivity factor is less than five. The period of construction activity begins at initial earth disturbance and ends with final stabilization. The location, timing, and duration of construction activities are to be used as inputs to calculate the R-factor via USEPA's Rainfall Erosivity Factor Calculator for Small Construction Sites (USEPA LEW, 2024). Where vegetation will be used for final stabilization, the date of installation of a stabilization practice that will provide interim non-vegetative stabilization can be used for the end of the construction period, provided the operator commits (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the CGP have been met.

If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with its certification statement constitutes acceptance of and commitment to complete the final stabilization process. SPA must submit a waiver certification to the USEPA via NeT prior to commencing construction activities. If your small construction project continues beyond the projected completion date given on the waiver certification, you must recalculate the rainfall erosivity factor for the new project duration. If the R factor is below five, SPA must update all applicable information on the waiver certification and retain a copy of the revised waiver as part of your records. The new waiver certification must be submitted prior to the projected completion date listed on the original waiver form to assure SPA's exemption from permitting requirements is uninterrupted. If the new R-factor is five or above, SPA must obtain NPDES permit coverage.

4.1.3 Best Management Practices:

Silt Fences:

- Install silt fences along the perimeter of the site and at locations where stormwater runoff is likely to occur.
- Inspect silt fences weekly and after significant rainfall events. Promptly repair or replace damaged sections.
- Remove silt fences only after vegetation is established and the risk of erosion has been minimized.

Check Dams:

- Construct check dams in drainage channels and areas of concentrated flow to reduce water velocity and sediment capture.
- Inspect check dams regularly and after rainfall. Promptly remove accumulated sediment and repair any damage.

Wattles:

- Place wattles around the shoreline to prevent any water quality issues.

Erosion Control Blankets:

- Install erosion control blankets on slopes and disturbed areas to prevent soil erosion.
- Inspect blankets regularly and after storms to ensure they remain securely in place.
- Remove blankets only after native vegetation is established and the risk of erosion is minimized.

Mulch:

- Apply mulch to disturbed areas to protect soil from erosion, retain moisture, and promote plant growth.
- Reapply mulch as needed, particularly after heavy rains or wind events.

Good Housekeeping Practices:

- Keep the management area site free of debris, litter, and waste materials. Use covered containers for waste disposal.
- Store construction materials, chemicals, and waste in designated areas with secondary containment to prevent spills and leaks.

Spill Prevention Response:

- Equip the site with spill response kits and ensure that all personnel are trained in their use.
- If a spill occurs, follow CN's spill prevention plan. Any equipment in disrepair shall be removed from the site immediately.
- Report spills immediately to the site supervisor and take prompt action to contain and clean up spills.
- All heavy and motorized equipment will be inspected prior to being mobilized to the site to ensure that there are no leaks or drips.

- All fueling of the equipment or maintenance work will be performed at the maintenance yard.

Stabilized Construction Entrance/Exists:

- Install stabilized entrances and exits using gravel or other suitable materials to minimize sediment tracking onto public roadways.
- Regularly inspect and maintain stabilized entrances/exits to ensure their effectiveness.

Dust Control:

- Apply water to exposed soil and unpaved roads to minimize dust generation.
- Limit vehicle speed on unpaved areas to reduce dust.

4.2 Pesticide General Permit

Targeted pesticide application methods vary by sub-management area at the Project location. The Project sub-management areas are listed below with planned pesticide application methods and type of herbicide utilized. Herbicide information is provided in Table 7.

It will be ensured that during each phase of the Project, the proper environmental compliance and associated permits be obtained prior to commencement of work. This requires coordination and planning between the respective Albuquerque District technical sections and offices: Operations Division Support (ODS), Environmental Resources (PMLE), Environmental Engineering (ECGE), Engineering and Construction (ECEC), and the Conchas Lake Project Office.

A project-specific pesticide application plan will be prepared by the certified applicator overseeing the application and submitted to ODS and ECGE for review and approval. See Appendix 3 for information on Albuquerque District's Pesticide Management Plan (PMP). The plan must include: sequence of treatment, dates, times, locations, pesticide trade names, EPA registration numbers, acreage, types and quantities of pesticides used during each calendar year (due annually on 15 January of each calendar year), authorized uses, chemical composition, formulation, original and anticipated concentration, application rates of active ingredient (i.e. pounds or volume of active ingredient applied), equipment used for application, locations for pesticide mixing and storage, Safety Data Sheets (SDS), pollution prevention and spill response plans, calibration of equipment and departures from the manufactures specifications, meteorological monitoring location and thresholds for application. Federal, State, Regional and Local pest management record-keeping and reporting requirements, as well as any additional project office-specific requirements, shall be fulfilled. See Appendix 3 for the Albuquerque District Pesticide Control Plan and reporting form document for when pesticides are to be applied.

The NPDES Pesticide General Permit (PGP) regulates point source discharges from the application of pesticides to Waters of the United States (WOTUS). The USEPA's PGP covers discharges in areas where USEPA is the NPDES permitting authority, which include four states (Idaho, Massachusetts, New Hampshire, and New Mexico), Washington, D.C., all U.S. territories except the Virgin Islands, most Indian Country, and federal facilities in four additional states (Colorado, Delaware, Vermont, and Washington). The provisions of the PGP are designed to improve protection of our nation's water quality by minimizing discharges of pesticides to waters of the United States. USEPA's final permit covers discharges of biological pesticides, and chemical pesticides that leave a residue, from Mosquito and other flying insect pest control, Weed and algae control, Animal pest control, and Forest canopy pest control.

Areas below the Ordinary High-Water Mark (OHWM; 4196.69 NGVD29) are considered WOTUS and are subject to the requirements of the PGP. The 4196.69 contour will be included on all project area maps to delineate areas within and outside WOTUS. If coverage is required, ECGE will use the eNOI system to submit an NOI, Annual Report, or Notice of Termination (NOT) for pesticide discharges under EPA's 2021 PGP. For example, the herbicide Garlon 3A is approved for near water use and will be applied via cut-stump and/or foliar methods if within 50-feet of the shoreline. Other herbicides not approved for application near water use such as Garlon 4, will be applied to areas 50-feet above the OHWM via cut-stump and/or foliar methods.

Targeted pesticide applications will be implemented at the Project sub-management areas (see section 5, Management by Habitat Type and Land Use, and Figure 6: Detailed view of Invasive Species Management Areas at Conchas Lake), including but not limited to the following methodologies: Low Volume Basal Bark Herbicide Application, cut-stump and foliar application. Pesticide application will be transported and applied by the following: back-pack mounted, ATV-mounted, and truck-mounted. When selecting an application type, Project Offices must consider the pros and cons of each technique. Backpack or ATV mounted sprayers allow for more targeted application and minimize land disturbance.

USACE will ensure the safe application of herbicides within park areas while minimizing risks to visitors through effective coordination and communication with New Mexico State Parks. Prior to any herbicide application, USACE will notify New Mexico State Parks at least 24 hours in advance. This notification will include details such as the type of herbicide, application methods, specific locations, dates, and times of application. Signage will be clearly posted at all entry points and within affected areas at least 24 hours before herbicide application. The signs will include information on the herbicide(s) being used, the date and time of application, and any necessary precautions. USACE will establish physical barriers or cordon off areas where herbicide application is taking place to prevent visitor access during and immediately after treatment. Herbicide application will be scheduled during off-peak hours when visitor presence is minimal, such as early mornings and weekdays, to reduce the likelihood of visitor exposure. Weather conditions will be monitored, and application schedules will be adjusted to ensure visitor safety and ensure optimal conditions for herbicide efficacy. Post-application, USACE will follow herbicide label recommendations for re-entry to treated areas. In the event of accidental exposure or herbicidal drift, USACE will promptly report the incident to New Mexico State Parks. USACE will maintain ongoing communication and collaboration with New Mexico State Park officials to ensure safety remains a priority during herbicide application.

4.3 Disposal

Disposal of all projects-related wastes shall be off-site and in accordance with all federal, state, regional and local laws, and regulations. The Project Office will identify haul routes, stockpiling, burning, and staging to support the necessary removal or disposal of vegetation. The Project office and/or the Contractor shall work with the members of ODS, PMLE, ECGE, and ECEC to determine the following: 1) Name of landfill and recycling facilities by name, location, and phone number, including a copy of the permit or license for each facility in ProjectWise; 2) description of the means of transportation for the waste and recyclable materials; 3) describe how the waste and recyclable materials (i.e., beyond metal) will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site; 4) documentation in ProjectWise the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed of by landfill or incineration.

Chipping of saltcedar branches is prohibited, as it will not eliminate the seed source and will facilitate germination elsewhere. Thus, it is recommended that all saltcedar be stockpiled and disposed of via self-contained incinerator or landfill. USACE suggests utilizing a landfill operated by the City of Tucumcari, New Mexico is located at 30652 US Highway 54. The hours of operation are Monday through Friday, 1200pm to 400pm and the first Saturday of the month, 1200pm to 400pm. Contact the City of Tucumcari Landfill by phone at (575)-403-6337. The landfill will not accept liquids, batteries, and fertilizers. The City of Tucumcari Landfill does accept co-mingled (mixed) material. However, the landfill would prefer that any waste be separated prior to delivery to the landfill. Currently, the city of Tucumcari only accepts cash or check. An alternative payment strategy would be to set up an account with Tucumcari City Hall. Tucumcari City Hall can be contacted by phone (575)-461-3451.

4.4 Treatment Methodology

4.4.1 Manual Removal

Immature plants (about two feet tall or less) can be managed by hand removal, hoeing, or digging. Manual removal can be used to target individual plants in relatively small areas. Some commercially available hand implements are practical for uprooting small saltcedar plants; however, a shovel or hoe is more commonly used. The root crown and all associated layered roots must be entirely removed from the soil. Saltcedar and Russian olive can sprout from cut stems and sections of buried roots. Uprooted material should be stacked in piles and allowed to dry before burning or mulching.

4.4.1.1 Manual Removal Best Management Practices

Planning and timing:

- Conduct a thorough assessment of the area to identify target species and determine extent of invasive plants.
- Schedule removal activities during cooler parts of the day or year to minimize worker stress and reduce soil disturbance.
- Target invasive species before they flower and set seed to prevent their reproduction and spread.

Techniques:

- Use appropriate tools such as gloves, hand trowels, hoes, and pruners to remove plants, ensuring roots are extracted to prevent regrowth.
- Avoid disturbing the soil excessively to reduce erosion and potential invasive species to colonize.

Disposal:

- Properly dispose of removed vegetation to prevent reestablishment.
- Use designated disposal areas.

Monitoring and Maintenance:

- Regularly monitor for regrowth of invasive species and perform follow up removal as necessary.
- Keep records of removal activities, including dates, methods, and observations to inform future management efforts.

Erosion Control:

- Implement erosion control measures, such as using mulch or erosion control blankets, especially on slopes or areas prone to erosion.

4.4.2 Low Volume Basal Bark Herbicide Application

Basal bark herbicide application is a technique used to control woody plants and trees by applying herbicide directly to the bark. This method is effective without the need for cutting or felling plants. Small saltcedar and Russian olive saplings and regrowth (stems less than two to three inches in diameter at ground level and less than eight feet tall) can be managed by basal bark herbicide application of herbicide with triclopyr as the active ingredient (Table 7). Apply the herbicide mixture to the lower 12-18 inches of the trunk, encircling it completely. Ensure thorough coverage of the bark, paying special attention to crevices and cracks. Use a backpack sprayer, or a brush to apply the herbicide.

4.4.2.1 Low Volume Basal Bark Best Management Practices

Site Assessment:

- Identify target species and ensure they are susceptible to basal bark treatment.
- Assess the site for any non-target plants or environmental concerns, such as proximity to the OHWM.

Weather Conditions:

- Avoid application during high winds or heavy rain to prevent drift or runoff.
- Apply herbicide when temperatures are above freezing to ensure herbicide effectiveness.

Herbicide Selection:

- Choose an appropriate herbicide for the target species and site conditions.
- Follow all label instructions regarding herbicide selection, mixing, and application.

Application Technique:

- Apply the herbicide uniformly around the circumference of the tree or plant.
- Avoid excessive runoff by controlling the flow rate of the applicator.
- Use buffer zones to protect non-target species and wildlife habitats.
- Herbicides approved for riparian or aquatic use shall be applied to vegetation within 50 ft. of standing water or within OHWM.
- Clean machinery prior to moving it into and out of the area.
- If any unknown solid wastes or any hazardous, toxic, or radioactive wastes are identified during the execution of the project ECGE shall be contacted and a plan for remediation or removal shall be prepared.

Disposal:

- Properly dispose of cut vegetation to prevent resprouting or spreading of invasive species: chipping, burning, or removing the material from the site.

Monitoring and Adaptive Management:

- Maintain detailed records of low volume basal bark herbicide treatments, including date, location, species treated, herbicide applied, and application rates.
- Monitor treated areas regularly for signs of regrowth or new invasives.
- Record effectiveness.
- Perform follow-up treatments as necessary to ensure complete control of the target species.

4.4.3 Cut-Stump Herbicide Application

The cut-stump methodology will be applied to large trees with thick bark (growth greater than three-inches in diameter). The cut-stump method involves cutting and herbicidal treatment to achieve "root kill." This involves cutting the trunk just above the ground with a chainsaw, handsaw, or loppers and immediately applying an amine formulation mixed with an herbicide with a triclopyr, glyphosate, or imazapyr active ingredient to the cut surface (Table 7). Apply the herbicide to the cambium layer (the outer edge of the stump, just inside the bark) to ensure absorption. Ensure thorough coverage of the cut surface without causing runoff.

4.4.3.1 Cut-Stump Best Management Practices

Site assessment:

- Identify the target species and confirm for suitability for cut-stump treatment.
- Assess the area for non-target plants, water bodies, and other environmental considerations.

Weather Conditions:

- Avoid application during high winds or heavy rain to prevent drift or runoff.
- Apply herbicide when temperatures are above freezing to ensure herbicide effectiveness.

Herbicide Selection:

- Choose an appropriate herbicide based on the target species and site conditions.
- Follow all label instructions regarding mixing, application rates, and safety precautions.

Application Techniques:

- Apply herbicide immediately after cutting to prevent the stump from sealing and reducing herbicide absorption.
- Focus on the outer edge of the stump (cambium layer) for to ensure optimal herbicide uptake.
- Avoid herbicide application near waterbodies, wetlands, or sensitive habitats unless the herbicide is approved for such areas.
- Use buffer zones to protect non-target vegetation and wildlife habitats.
- Avoid applying herbicide during heavy rainfall or freezing conditions.
- Herbicides approved for riparian or aquatic use shall be applied to vegetation within 50 ft. of standing water or within the OHWM.
- If any unknown solid wastes or any hazardous, toxic, or radioactive wastes are identified during the execution of the project ECGE shall be contacted and a plan for remediation or removal shall be prepared.

Disposal:

- Properly dispose of cut vegetation to prevent resprouting or the spread of invasive species by chipping, burning, or removing the material from the site.

Monitoring and Adaptive Management:

- Maintain detailed records of cut-stump treatments, including date, location, species treated, herbicide applied, and application rates.
- Monitor treated areas regularly for signs of regrowth or new invasives.
- Record effectiveness.
- Perform follow-up treatments as necessary to ensure complete control of the target species.

4.4.4 Foliar Application

The foliar method involves applying herbicide directly to the leaves of the plants. This method is especially effective for controlling herbaceous weeds, shrubs, and small trees. The foliar method will be applied to seedlings, sapling, or regrowth less than 3-inches in diameter and less than 6 to 8 feet tall as specified on herbicidal labels for foliar application and for herbicides specifically labeled for foliar application. Common active ingredients include glyphosate, triclopyr, 2,4-D, and imazapyr (Table 7). The equipment used for foliar application includes backpack sprayers, handheld sprayers, or boom sprayers for larger areas. Nozzles should deliver a fine spray to ensure effective coverage of leaves. Apply when plants are actively growing, and avoid applications during periods of drought or stress, as plants may not absorb the herbicide effectively.

4.4.4.1 Foliar Best Management Practices

Site Assessment:

- Identify target species and assess the extent of infestation.
- Assess the site for non-target plants or environmental concerns, such as proximity to the OHWM.

Weather Conditions:

- Avoid application during high winds or heavy rain to prevent drift or runoff.
- Apply herbicide when temperatures are above freezing to ensure its effectiveness.

Herbicide Selection:

- Select an appropriate herbicide for the target species and site conditions.
- Follow all label instructions for herbicide selection, mixing, and application.

Application Technique:

- Apply the herbicide uniformly to foliage, ensuring thorough coverage but avoid while avoiding runoff.
- Use low-pressure settings to minimize drift and protect non-target vegetation.
- Establish buffer zones to protect non-target species and wildlife habitats.
- Apply in calm weather conditions to reduce the risk of drift and runoff and avoid applications during high wind and rain events.

- Consider the impact on pollinators, and other beneficial insects and apply when they are less active (e.g., early mornings or late evenings).
- Herbicides approved for riparian or aquatic use should be applied to vegetation within 50 feet of standing water or within the OHWM.
- If any unknown solid wastes or any hazardous, toxic, or radioactive wastes are identified during the execution of the project ECGE shall be contacted and a plan for remediation or removal shall be prepared.

Disposal:

- Properly dispose of cut vegetation to prevent resprouting or spreading of invasive species: chipping, burning, or removing the material from the site.

Monitoring and Adaptive Management:

- Maintain detailed records of foliar treatments, including the date, location, species treated, herbicide applied, and application rates.
- Monitor treated areas regularly for signs of regrowth or new invasive species.
- Record effectiveness.
- Perform follow-up treatments as necessary to ensure complete control of the target species.

4.4.5 Mechanical Removal

Mechanical methods for treating invasive vegetation range in scale from individual plant excavation to broad-scale clearing. These methods often require repeated application for optimal results. Suggested mechanical treatment options are discussed below including, excavating, mulching, grubbing, and root plowing and raking.

4.4.5.1 Excavating

Excavating can be used to remove individual trees selectively. Operators of excavating equipment must skillfully place the extracting bucket beneath the root crown of the target plant and grasping the tree with an opposing hydraulic arm. The tree should be pulled directly upward in a vertical motion rather than sideways to minimize excessive breakage of the root material at or near the ground surface. Excavating can be effective for removing invasive trees while preserving surrounding vegetation.

4.4.5.2 Mulching

Mulching and excavating can be used in combination by first eliminating top growth of saltcedar quickly through mulching and then using excavation to destroy the remaining root system. Mulching requires mobile, high-horsepower machinery to operate a high-speed rotating drum equipped with cutting teeth. The mulching equipment mows saltcedar top growth to ground level and simultaneously grinds it into fine segments.

Mulching alone may be used to reduce fuel loading for fires by clearing significant acreage of saltcedar in a relatively short period of time. Mulching operations leave the roots intact; therefore, saltcedar will re-sprout when growth conditions become favorable and will typically reach 2 to 5 feet in height within the first or second season after mulching. A track-mounted excavator may be employed to remove the remaining live root crowns and layered roots as indicated by re-sprouting.

4.4.5.3 Grubbing

Mechanical grubbing can selectively remove individual large plants and trees on-site that can be accessed and where manual removal is impractical due to the extent or density of invasive species. Grubbing with a tractor-mounted implement is particularly useful for control of scattered individual trees. A grubbing tool mounted on a tractor's hydraulic system drives a blade into the soil to sever roots below the root crown and forcing the root crown onto the surface. The entire root system must be excavated and removed from the site. To prevent re-rooting, grubbed saltcedar should be piled, dried, and then either burned or mulched rather than left on the surface. Other mechanical control implements include using a skid steer with a forestry cutting/mowing attachment.

4.4.5.4 Root Plowing and Raking

Root plowing and raking is a combined mechanical treatment used to clear large, mature saltcedar stands on relatively level areas. A two-phase approach is generally followed. In the first phase, aerial trunks and stems are cut at the soil surface and piled using a D-7 or D-8 class bulldozer equipped with a front-mounted brush blade. An articulated loader equipped with a brush rake may work in tandem with a bulldozer to facilitate piling. Piles should be allowed to dry for a month or longer prior to burning. The work may be accomplished during winter months to avoid over-heating of equipment and summer nesting of birds. The second phase of control should occur during hot and dry summer months (usually May and June) when root material will dry out after removal from the soil. A 12-foot-wide root plow pulled by a bulldozer (e.g., D-7 class) can be used to sever the root crown from the remaining root system about 12 to 18 inches below the soil surface depending on the maturity of the saltcedar stand. Root material near the soil surface can then be raked by a bulldozer (e.g., D-8 class) equipped with a 21-foot-wide hydraulic root rake containing teeth that are four feet in length and are spaced fifteen inches apart. The material can then be windrowed and piled using an articulated loader. The piles are subsequently burned.

4.4.5.5 Mechanical Best Management Practices

Address dam operations management practices and develop BMPs for blading of roads on dam toes and around the fence line.

Minimize Impact:

- Use equipment appropriately sized for the task to minimize unnecessary soil disturbance and damage non-target vegetation.
- Select the right equipment for the job, considering the size, density, and location of the invasive species. (e.g. Excavators, bulldozers, skid steers, and mulching machines.)
- All heavy and motorized equipment will be inspected before being mobilized to the site to ensure that there are no leaks or drips.
- Perform all equipment fueling or maintenance work at designated maintenance yard.
- The equipment operator shall keep a spill kit on board including absorbent pads that can be used to contain any drips or spills that may result from operating the equipment. In the event of a spill, follow CN's spill prevention plan. Remove any equipment in despair from the site immediately Any equipment in disrepair shall be removed from the site immediately.
- Clean all previously used equipment by pressure washing and/or steam cleaning before bringing onto the project site. Equipment must be free from soil residues, plant pests and eggs, plant seeds, and noxious weeds.
- Use existing roads to access project areas.

Erosion/Contamination Control:

- Implement measures such as silt fences, check dams, and wattles, mulching, and reseeding with native plants to control erosion and promote stability (see BMPs under CGP in Section 4.1.3).

Disposal:

- Properly dispose of or manage removed vegetation to prevent reestablishment and spread of invasive species.

Monitoring and Adaptive Management:

- Maintain detailed records of cut-stump treatments, including date, location, species treated, herbicide applied, and application rates.
- Regularly monitor the site post-grubbing to detect and manage any regrowth or new invasion promptly.
- Record effectiveness.
- Perform follow-up treatments as necessary to ensure complete control of the target species.

Safety:

- Always follow safety guidelines when operating heavy machinery and ensure that all necessary permits and approvals have been obtained before starting any removal.

4.4.6 Burn Treatment and other Alternative Treatment Methodology

Other treatment types include a combination of control methods listed previously, aerial herbicide application, and burn treatment. Burn treatment (prescribed burning) is a technique that involves the intentional use of fire under controlled conditions to manage landscapes. This methodology is effective for reducing fuel loads, controlling invasive species, promoting native plant regeneration, and maintaining healthy ecosystems. However, burn treatment requires a separate, approved Burn Control Plan and Burn Permit.

Table 7: USACE Approved Herbicides

Herbicide Trade Name	Active Ingredients		Target Pest	EPA Class	EPA REG No.	Formulation	Label	Treatment Type	Above or Below Ordinary High Water Mark (OHWM)
Spectracide: Weed Stop for Lawns	2,4 - D, dimethylamine salt	7.57%	Annual Perennial Grasses, Noxious Weeds, and Broadleaf Weeds	General Use	9668-109-8845	Liquid	Caution	Foliar	Above
	Mecoprp-p, dimethylamine salt	2.73%							
	Dicamba, dimethylamine salt	0.71%							
	Sulfentrazone	0.18%							
Trisel: Selective Weed Killer	2,4-D, dimethylmine salt	4.55%	Broadleaf Weeds, woody plants, Noxious Weeds	General Use	10088-81-11547	Soluble Concentrate	Danger	Foliar, Cut stump, Basal Bark	Above
	2,4-DP-P, dimethylmine salt	2.26%							
	MCPP-P 2,4-D, dimethylmine salt	2.29%							
Vegetation Control W/2, 4-D Spray	Bomacil	0.98%	Non-selective herbicide for maintaining bare ground	General Use	10088-114-11547	Pressurized liquid	Caution	Foliar	Above
	2,4-D,2-ethylexyl ester	1.09%							
LESCO Three-Way Selective Herbicide	Dicamba, dimethylamine salt	2.77%	Broadleaf Weeds	General Use	10404-43	Soluble Concentrate	Danger	Foliar	Above
	2-4 D, dimethylamine salt	30.60%							
	MCPP-P 2,4-D, dimethylmine salt	8.17%							
Preen Lawn Braodleaf Weed Control	MCPP-p	0.31%	Broadleaf Weeds	General Use	961-418	Granular	Caution	Foliar	Above
	2,4-D	1.37%							

	2,5-Dichloro-6-methoxybenzoic acid	0.13%							
Razor Pro	Glyphosate isopropylamine	41.00%	Grass, Weeds	General Use	228-366	Soluble Concentrate	Caution	Foliar	Above
Roundup Weed & Grass Killer	Glyphosate isopropylamine salt	1.92%	Grass, Weeds	General Use	71995-23	Ready-to-Use Solution	Caution	Foliar	Above
Scott's Weed & Feed (Lawn pro weed and feed lawns)	2,4-D	1.18%	Broadleaf Weeds	General Use	538-270	Granular	Caution	Foliar	Above
Garlon® 4	triclopyr: 3,5,6-trichloro-2-pyridinloxyacetic acid, butoxythel ester	61.60%	Woody plants, annual and perennial broadleaf weeds	Specialty Herbicide	62719-40	Oil-based	Caution	Foliar, Cut stump, Basal Bark	Above
Garlon® 3A	triclopyr: 2-[(3,5,6-trichloro-2-pyridinyl)oxy] acetic acid, triethylamine salt	44.40%	Woody plants, annual and perennial broadleaf weeds and aquatic sites	Specialty Herbicide	62719-37	Water-based	Danger	Foliar, Cut stump, Basal Bark	Below

5 Management by Habitat Type and Land Use

The following subsections describe vegetation management by habitat type and land use. There are five management areas per habitat type and land use. Figure 5 shows treatment areas in relation to the land use and classification system defined in the Conchas Lake 2022 Master Plan, and Figure 6 shows a more detailed view of treatment areas throughout the Project. The five management areas are:

1) Shoreline Recreation Areas: South Campground Shore, Ranger Station Cove, Juniper Day-use Area Shoreline, Boat Ramp Peninsula, and Conchas Lodge (see Figure 7 through Figure 10).
2) Operations and Maintenance Areas: Operations and maintenance areas covered by a separate plan, Administration Areas, Below Dam, South Skirt Dam, and Irrigation headworks (Figure 12).
3) Upland Recreation Areas and Wildlife Management Areas: Big Mesa/Highway 104, and other Recreation and Wildlife Management Areas (Figure 16).
4) Environmentally Sensitive Areas (ESAs).
5) Out-granted Areas.

Within each subsection, a detailed synopsis is provided for site characteristics, a prescribed treatment plan, and recommendations for restoration and monitoring. For a detailed description of methodologies and best management practices for each recommended treatment type, please refer to Section 4 . Similarly, for a detailed description of methodologies for each recommended restoration and monitoring type, please refer to sections 6 and 7, respectively. Additionally, refer to Table 7 for a list of approved herbicides per treatment type.

Follow up restoration activities are essential following the removal of invasive species. Disturbed ground caused by removal of saltcedar has the potential to increase erosion and opens the area to early successional invasive species infestations. Restoration of these areas and treatment of re-sprouts is essential for maintaining a healthy ecosystem.

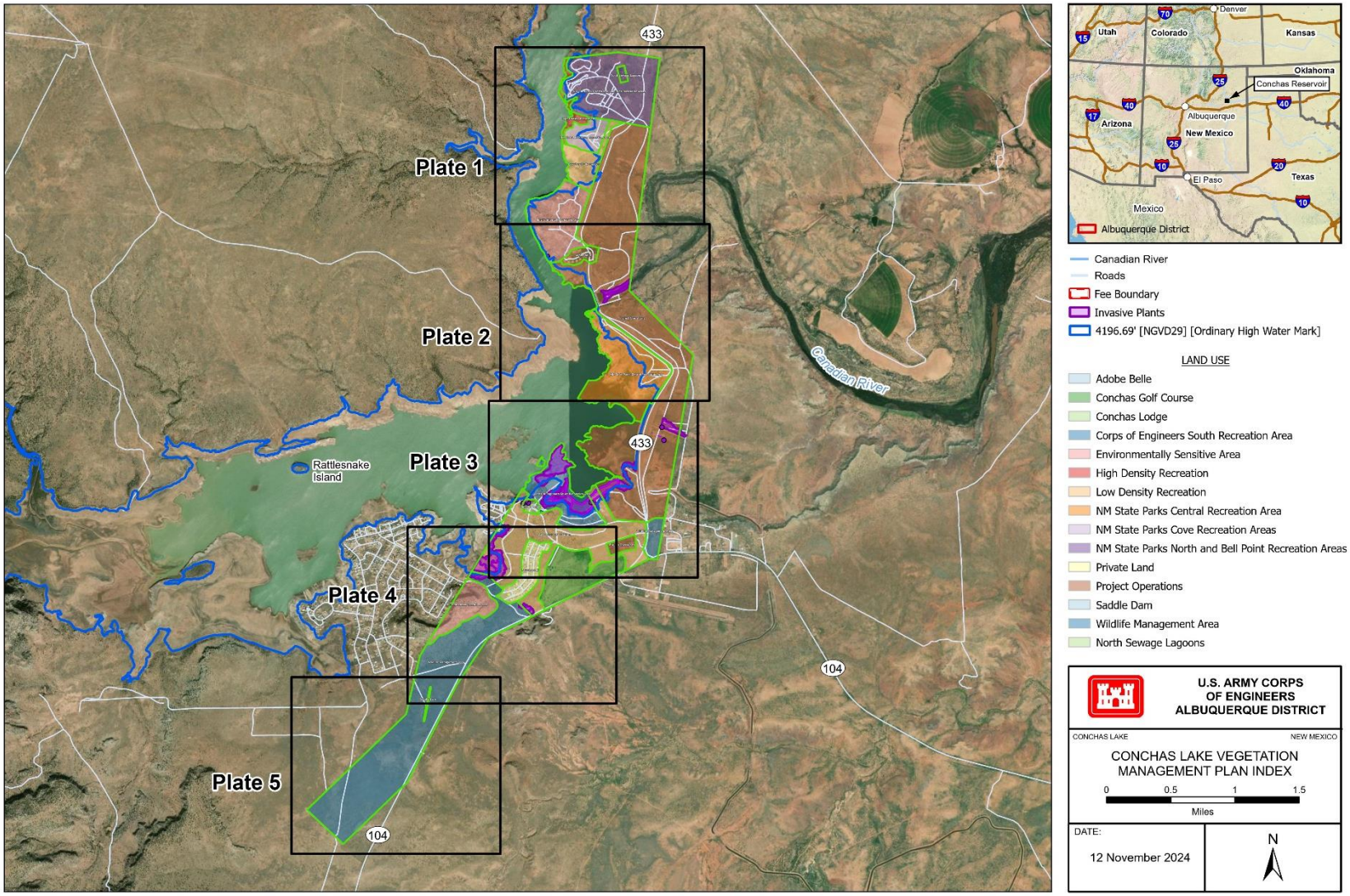


Figure 5: Treatment areas throughout Conchas Lake in relation to land use/classification.

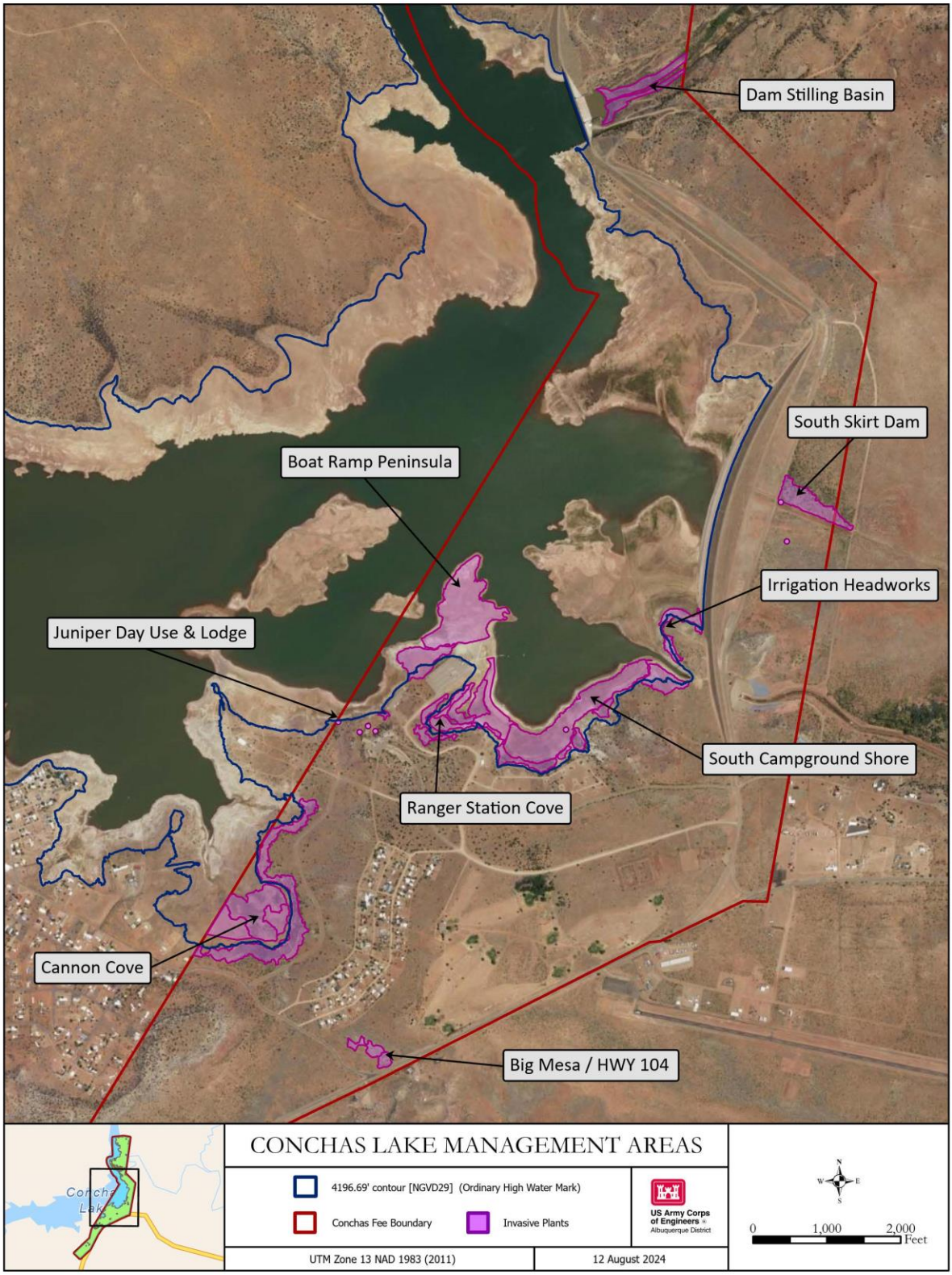


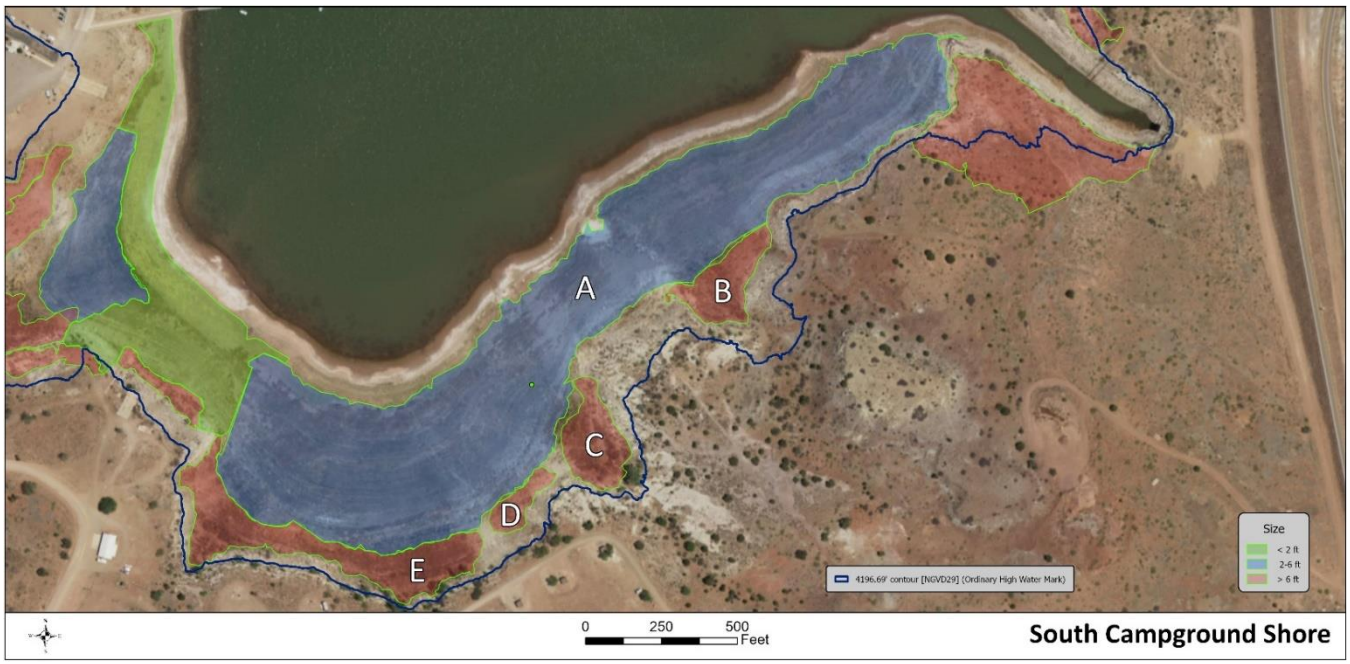
Figure 6: Detailed view of Invasive Species Management Areas at Conchas Lake

5.1 Shoreline Recreation Areas

Controlling saltcedar within shoreline recreation areas has been identified as the highest priority within this plan. Saltcedar densities are highest within these areas and pose threats to ecological function, recreation, watershed quality, and serve as a main seed source, causing further spread throughout the Conchas Project. This section describes the distribution of invasive species within shoreline recreation areas and provides a framework for treatment, and the associated restoration and monitoring of these sites.

5.1.1 South Campground Shore:

The South Campground is located on the south side of the dam near the south boat ramp (see Figure 7). The site serves as the primary USACE recreation area for the Project. The area is susceptible to early successional growth of invasive species such as saltcedar and Russian thistle due to fluctuating lake levels frequent ground water inundation. The vegetation within polygon A is comprised of dense stands of immature saltcedar (30% cover) with heavy infestation of Russian thistle (90% cover). Polygons B through E is comprised mostly of dead mature saltcedar (80%) with 1-5% being alive. Native vegetation present within the area includes mixed grasses, Baccharis, and cottonwood seedlings. The South Campground Shore site can be accessed by vehicle, machinery, UTV, and foot. Invasive species were mapped according to height and canopy cover into polygons A through E in Figure 7 below.



AREA	AREA/SIZE	COVER
A	16 ac 2-6 ft tall	Saltcedar seedlings 0-6 ft tall. 30% canopy cover. Russian thistle 90% canopy cover
B	0.8 ac > 6 ft tall	Saltcedar standing dead. 80% canopy cover. 2% alive
C	0.8 ac > 6 ft tall	Saltcedar standing dead. 80% canopy cover. 1% alive
D	0.3 ac > 6 ft tall	Saltcedar standing dead. 80% canopy cover
E	2 ac > 6 ft tall	Saltcedar average canopy cover 80% standing dead. 5% alive.

Figure 7: South Campground Shore

Treatment Plan:

Polygon A: The recommended treatment type for polygon A is mechanical removal via tractor mounted implement or skid steer. Foliar application is recommended for any areas within polygon A which are not accessible to mechanical removal and to treat resprouts.

Polygons B through E: The recommended treatment types for polygons B through E are cut-stump and/or foliar application. Alternatively, mechanical removal is recommended wherever possible. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter.

Monitoring and Restoration Plan:

Polygon A: Resprouts and seedlings should be retreated on a monthly basis during growing season. In addition, the site should be reseeded each fall with native grass and forb mix, and early successional annual or biennial species.

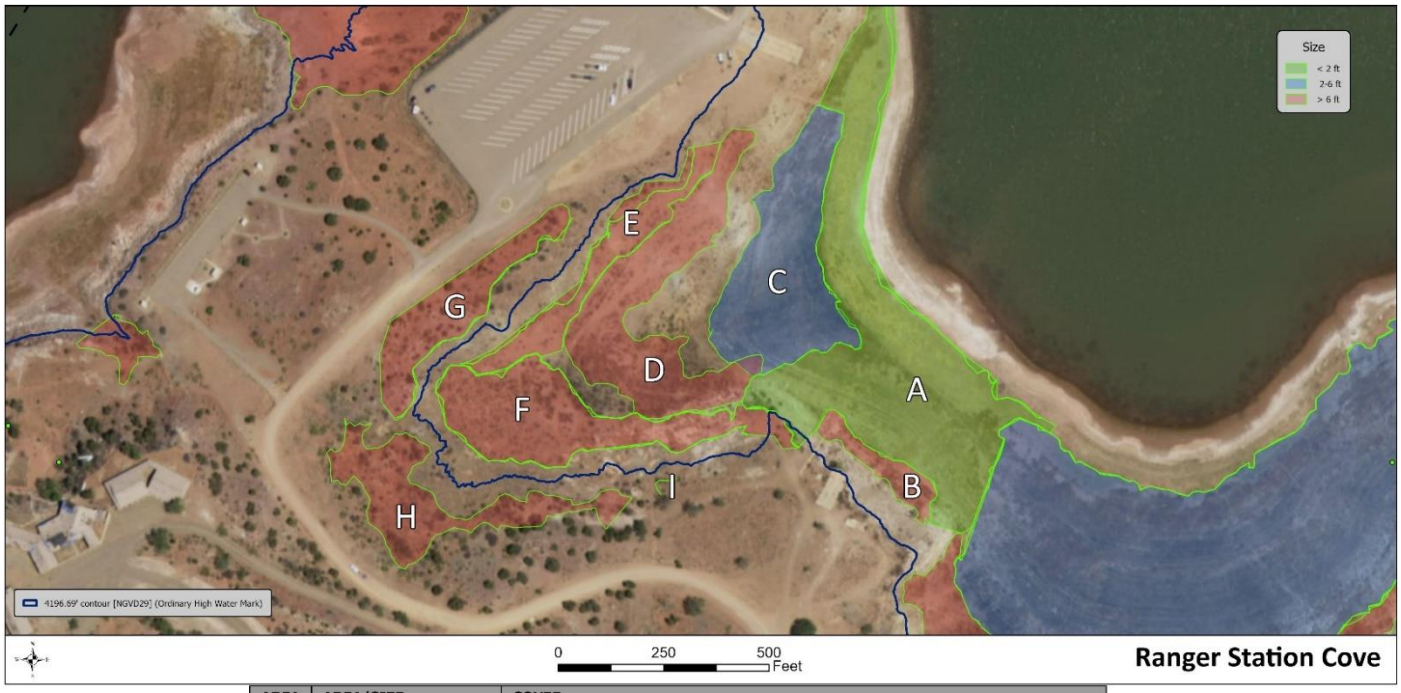
Polygons B through E: Reseed with native grass and forb mix, and early successional annual or biennial species on shoreline/beach areas that get regularly inundated. Seed and plant willow and cottonwood poles (see section 6) in the fall. Monitor for and treat resprouts and seedlings monthly during growing season and during routine NRM patrols.

The majority of the treatment area within the South Campground lies below the OHWM and requires the use of an aquatic approved herbicide (see section 4 for details). Also note that a SWPPP may be needed for mechanical removal (see section 4.1.1).

Compliance and Constraints: No eligible historic properties are within the area of potential effect (APE) for this immediate area. There are no cultural resource restrictions for methods used within the polygons shown on this map of the South Campground Shore area.

5.1.2 Ranger Station Cove:

Ranger Station Cove is located on just south and adjacent to the South Campground (see Figure 8). The area is susceptible to early successional growth of invasive species such as saltcedar and Russian thistle due to fluctuating lake levels frequent ground water inundation. Polygons A and C are heavily infested with Russian thistle (90% cover) mixed with immature saltcedar (10% cover). Polygons B, D, H, I, and G mostly consist of large dead saltcedar (> 3” in diameter with 50%-80% cover). Polygons E and F consists mostly of saltcedar seedings (60% cover). Native vegetation present within the area includes mixed grasses, Baccharis, and mesquite. Ranger Station Cove can be accessed by vehicle, machinery, UTV, and foot. Invasive species were mapped according to height and canopy cover into polygons A through I in Figure 8 below.



AREA	AREA/SIZE	COVER
A	4.0 ac < 2' tall	90% Russian thistle canopy cover, 10% saltcedar seedlings/saplings canopy cover.
B	0.3 ac > 6' tall	Saltcedar standing dead. 80% canopy cover
C	1.8 ac 2'-6' tall	Saltcedar seedling thicket. 60% canopy cover. Old standing dead sapling 10% canopy cover
D	1.1 ac > 6' tall	Saltcedar standing dead 75% canopy cover ??
E	0.8 ac > 6' tall	Saltcedar live saplings <3" stem diameter. 60% canopy cover
F	1.7 ac > 6' tall	Saltcedar live adults/saplings <3" stem diameter. 75% canopy cover.
G	0.9 ac > 6' tall	Saltcedar live old growth >3" stem diameter. 50% canopy cover
H	1.5 ac > 6' tall	Saltcedar live old growth >3" stem diameter. 50% canopy cover
I	Short line of trees > 6' tall	Saltcedar old growth live >3" stem diameter

Figure 8: Ranger Station Cove

Treatment Plan:

Polygons A and C: The recommended treatment is mechanical removal via tractor mounted implement or skid steer. Foliar application and/or cut-stump is recommended for any areas within polygons A and C which are not accessible to mechanical removal and to treat resprouts. Treatment should be conducted on a monthly or bi-monthly during growing season (March – October) and monthly during dormant season.

Polygons B, D, H, I, and G: The recommended treatment types are cut-stump and/or foliar application. Alternatively, mechanical removal is recommended wherever possible. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter.

Polygons E and F: The recommended treatment types are cut-stump and/or foliar application. Alternatively, mechanical removal is recommended wherever possible. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter.

Please refer to section 4.4 for a list of detailed treatment methodologies and best management practices, and Table 7 for a list of approved herbicides per treatment type.

Monitoring and Restoration Plan:

Polygon A and C: Resprouts and seedlings should be retreated monthly during growing season. In addition, the site should be reseeded each fall with native grass and forb mix, and early successional annual or biennial species.

Polygons B, D, H, I, and G: Reseed with native grass and forb mix, and early successional annual or biennial species on shoreline/beach areas that get regularly inundated. Seed and plant willow and cottonwood poles (see section 6.1) in the fall. Monitor for and treat resprouts and seedlings monthly during growing season and during routine NRM patrols.

Polygons E and F: Reseed with native grass and forb mix, and early successional annual or biennial species on shoreline/beach areas that get regularly inundated. Seed and plant willow and cottonwood poles in the fall. Monitor for and treat resprouts and seedlings monthly during growing season and during routine NRM patrols.

Most of the treatment area within Ranger Station Cove lies below the OHWM and requires the use of an aquatic approved herbicide. Also note that a SWPPP may be needed for mechanical removal.

Please refer to sections 6 and 7 for detailed restoration and monitoring methodologies.

Compliance and Constraints: No eligible historic properties are within the area of potential effect (APE) for this immediate area. There are no cultural resource restrictions for methods used within the polygons shown on this map of the Ranger Station Cove area.

Please refer to section 4 for a list of detailed treatment methodologies and best management practices, and Table 7 for a list of approved herbicides per treatment type.

5.1.3 Boat Launch Peninsula:

The Boat Launch Peninsula is located just North of Ranger Station Cove and serves as the primary boat ramp for USACE. The area is susceptible to early successional growth of invasive species such as saltcedar and Russian thistle due to fluctuating lake levels frequent ground water inundation. The site can be easily accessed by vehicle, machinery, UTV, or by foot. The area is mostly unvegetated (60% bare ground) with 50% cover of Russian thistle and <10% cover of immature saltcedar. The area is sparsely vegetated with native species such as mixed grasses, *Baccharis*, and mesquite. See Figure 9 below for details.

Figure 9: Boat Launch Peninsula

Treatment Plan:

The recommended treatment types are cut-stump and/or foliar application. Alternatively, mechanical removal is recommended wherever possible. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter.

Monitoring and Restoration Plan:

Resprouts and seedlings should be retreated on a monthly basis during growing season. In addition, the site should be reseeded each fall with native grass and forb mix, and early successional annual or biennial species.

Please refer to sections 6 and 7 for detailed restoration and monitoring methodologies.

Compliance and Constraints: For portions of the boat ramp peninsula polygons that are above an elevation of 4,172 feet, there are no restrictions on methods due to cultural resources concerns. However, areas below 4,172 feet have not been surveyed due to inundation. Work below 4,172 ft will need to undergo Section 106 consultation involving archaeological survey before implementation of vegetation management tasks within those areas.

5.1.4 Juniper Day-use Area Shoreline and Conchas Lodge:

The Juniper Day Use Area shoreline and Conchas Lodge are located just north and northeast of the historic Conchas Loge. The site can be accessed by vehicle, UTV, and foot. Native vegetation near the shoreline includes several grass species and Baccharis, whereas upland areas include more diversity of grass species, Baccharis, mesquite, and other mixed shrubs and forbs. Invasive species were mapped according to height and canopy cover in Figure 10 below.

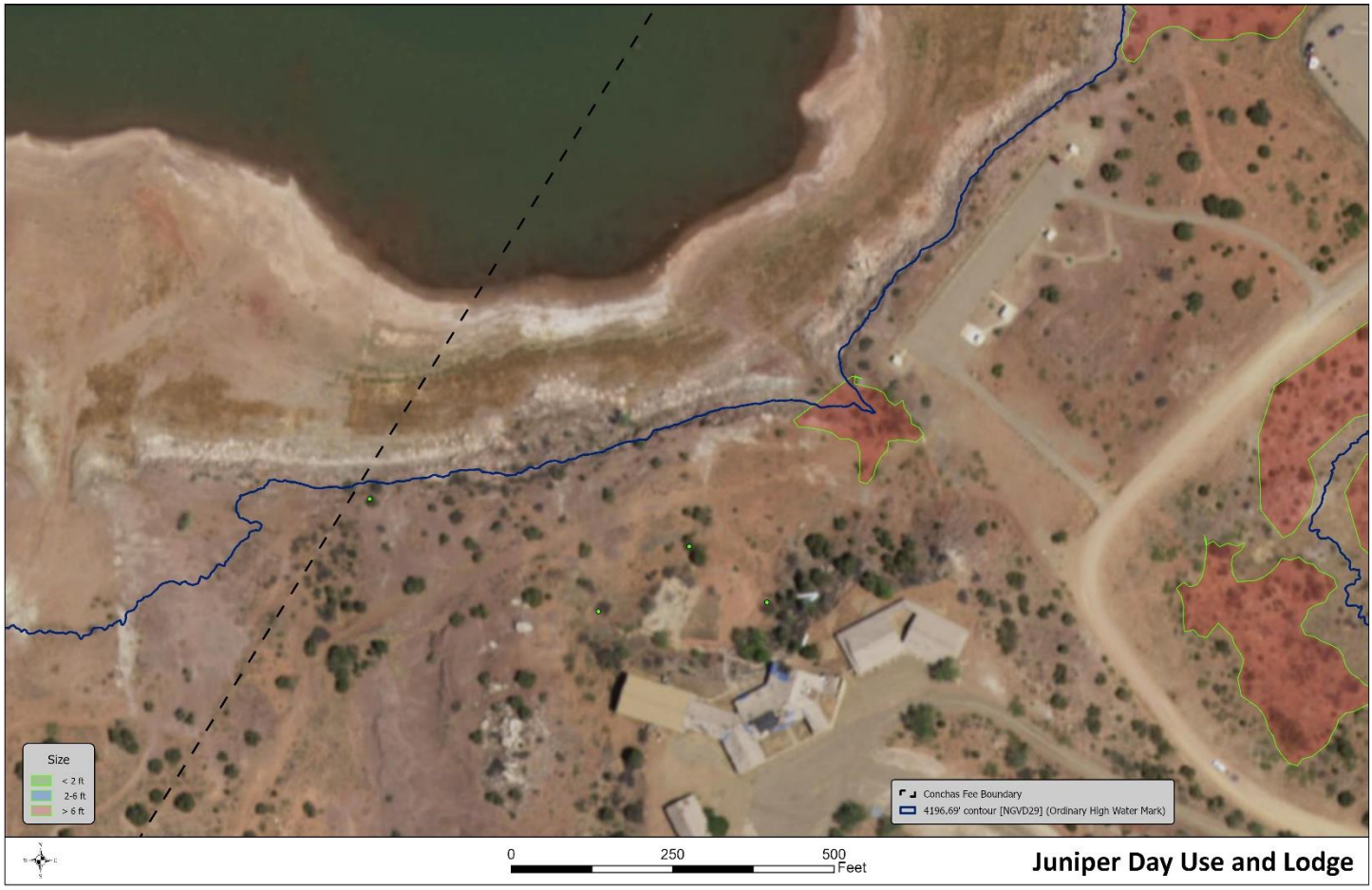


Figure 10: Juniper Day Use Area and Lodge

Treatment Plan:

The recommended treatment types are cut-stump and/or foliar application. Alternatively, mechanical removal is recommended wherever possible. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter.

Monitoring and Restoration Plan:

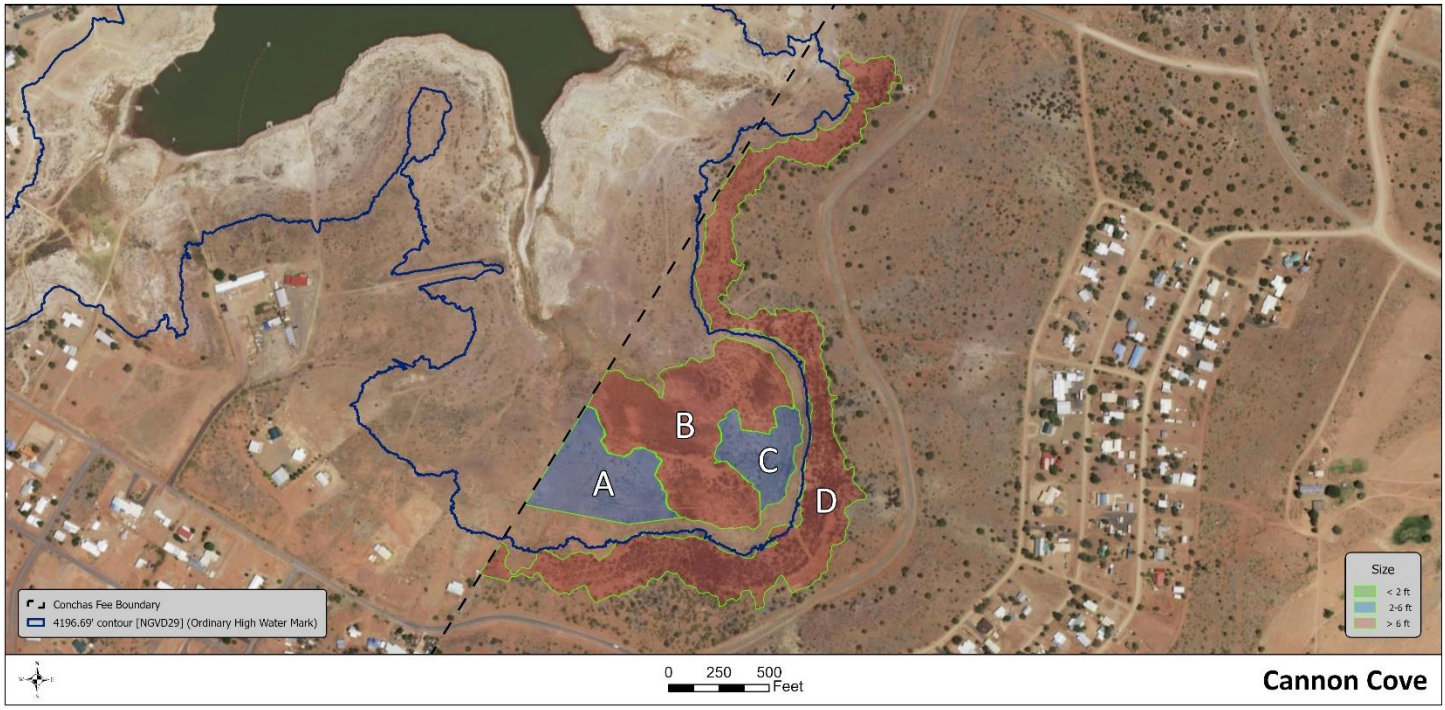
Resprouts and seedlings should be retreated on a monthly basis during growing season. In addition, the site should be reseeded each fall with native grass and forb mix, and early successional annual or biennial species.

Please refer to sections 6 and 7 for detailed restoration and monitoring methodologies.

Compliance and Constraints: There are no restrictions on methods for use within this polygon for cultural resources concerns. The polygon is near the historic Conchas Lodge, but vegetation work in this polygon would have no effect on the Lodge as long as the Lodge is avoided in all staging and other activities.

5.1.5 Cannon Cove:

The Cannon Cove is located just west of the town of Big Mesa. The site can be accessed by vehicle, foot, and UTV. Native vegetation near the shoreline includes several grass species and Baccharis, whereas, upland areas include more diversity of grass species, Baccharis, mesquite, and other mixed shrubs and forbs. Invasive species were mapped according to height and canopy cover in below.



AREA	AREA/SIZE	COVER
A	3.5 ac 2'-6' tall	Mostly live, mostly <3" diam stems. 20% canopy cover
B	7.8 ac > 6" tall	Plants at lower elevations are dead. No native woody plants
C	1.9 ac 2'-6" tall	Live, sapling size, <3" diameter stems. 40% canopy cover
D	13 ac > 6' tall	Live old growth >3" diameter stems. 3-6' tall. 65% canopy cover overall; 10-100% in places. Some juniper, saltbush, mesquite, sumac along up-shore edges (high water line)

Figure 11: Cannon Cove

Treatment Plan:

The recommended treatment types are cut-stump and/or foliar application. Alternatively, mechanical removal is recommended wherever possible. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter.

Monitoring and Restoration Plan:

Resprouts and seedlings should be retreated on a monthly basis during growing season. In addition, the site should be reseeded each fall with native grass and forb mix, and early successional annual or biennial species.

Please refer to sections 6 and 7 for detailed restoration and monitoring methodologies.

Compliance and Constraints: Hand removal only may be performed within Area A. Any reseeding within Area A must avoid ground or surface disturbance.

5.2 Project Operations and Maintenance Areas covered under SPA Pesticide Use Plan

Dam Operations vegetation free zones are already captured in the District's Routine Vegetation Management Plan for Dam Safety (USACE 2020: available upon request only). Therefore, this Plan does not cover the routine vegetation management that is required by USACE regulations for dam safety. This type of routine vegetation management applies to: 1) the dam and dam toe area, 2) in or around seepage monitoring systems or critical areas for seepage observation, 3) abutments and groins, 4) emergency spillways and regulating outlet channels, including channel floors, side slopes and approaches, and 5) outlet works discharge channels. Figure 12 illustrates areas which are captured in the District's Routine Vegetation Management Plan for Dam Safety.

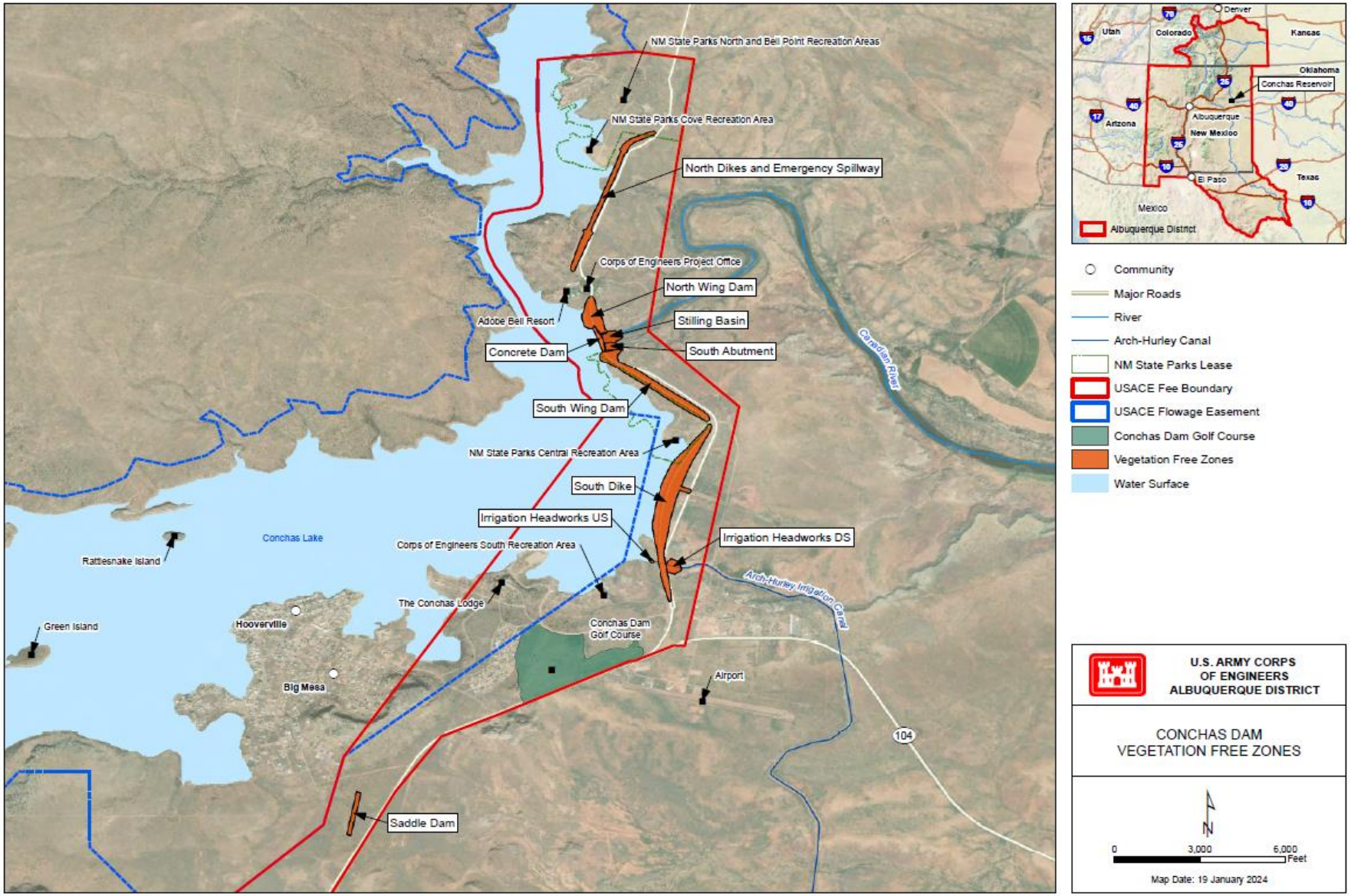


Figure 12: Areas within Project boundary that are covered under a separate plan (Routine Vegetation Management Plan for Dam Safety)

5.3 Project Operations and Maintenance Areas

5.3.1 Administrative Areas

Administrative Areas are located to the west of the Captain Kramer Day use area and consist of, the historic Project Office, Adobe Bell historic housing, maintenance yard, and solar power station. These are landscaped areas maintained by project staff. Landscaping consists of low turf grasses, Chinese Elm, Western Red Cedar, pinion pine, mesquite, and saltcedar along the shoreline directly south of the admin building.

Treatment Plan:

The recommended treatment types for saltcedar along the shoreline are cut-stump and/or foliar application. Alternatively, mechanical removal is recommended wherever possible. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter. Within the admin area, it is recommended that native shade trees such as hackberry, and lacebark elm be incrementally planted to eventually replace existing invasive shade trees (Chinese elm) as they die off, in order to preserve the historic viewshed within the Conchas Historic District.

Monitoring and Restoration Plan:

Resprouts and seedlings should be retreated on a monthly basis during growing season. In addition, the site should be reseeded each fall with native grass and forb mix, and early successional annual or biennial species.

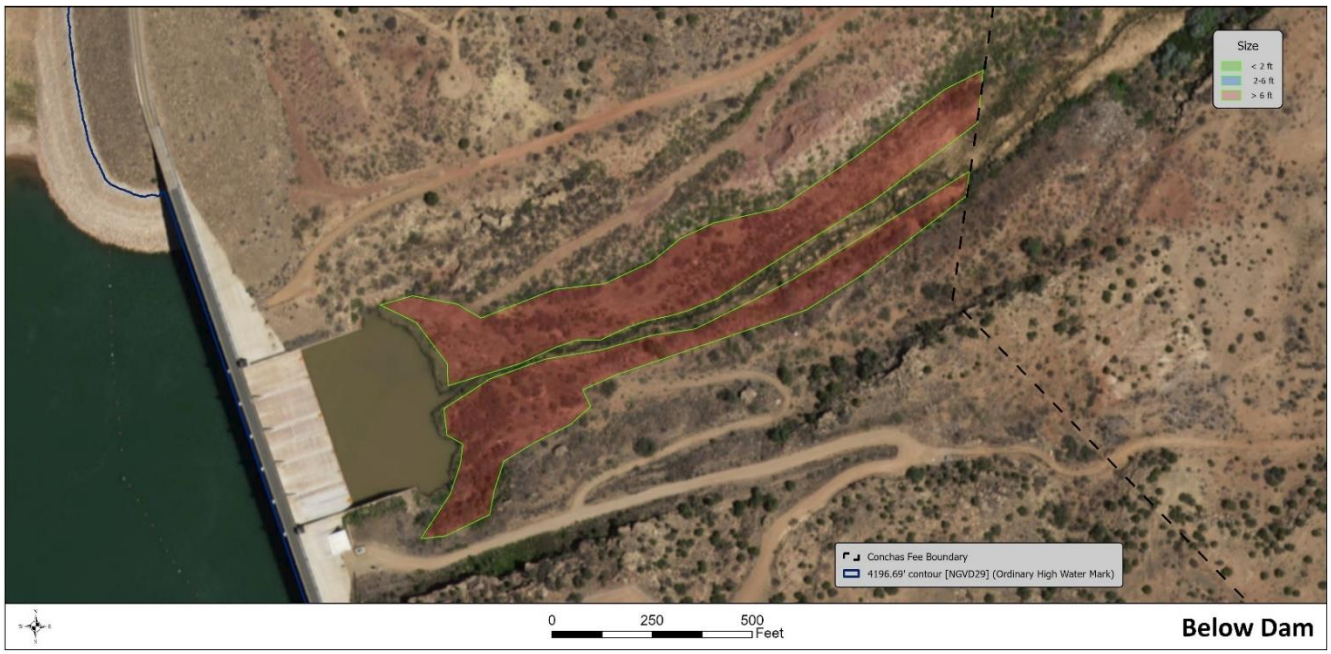
Please refer to sections 6 and 7 for detailed restoration and monitoring methodologies.

Compliance and Constraints:

The portions of the administrative area that lie within the Conchas Dam Historic District boundaries were substantially modified during dam construction, so any digging or ground disturbance within those areas would not adversely affect any intact buried archaeological deposits; this has been confirmed through prior Section 106 consultation and is exempt under the PA. Regarding the viewshed and historic setting of the Historic District itself, the approach described above under this Plan would not adversely affect the District.

5.3.2 Below Dam:

The west side of the site can be accessed by vehicle, although most of the site is only accessible to UTV or by foot. Native vegetation includes Atriplex, mesquite, Baccharis, mixed grasses, forbs, and a few occurrences of honey locust. See Figure 13 for details.



AREA/SIZE
5.6 Acres of Tamrisk below Dam. > 6' tall Live old growth >3" stem diam

Figure 13: Below Dam.

Treatment Plan:

The recommended treatment types are cut-stump and/or foliar application. Mechanical removal is not recommended as a treatment due to potential destabilization of the slopes and erosion concerns. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter.

Monitoring and Restoration Plan:

Resprouts and seedlings should be retreated on a monthly basis during growing season. Seed and plant willow poles (see section 6.1) in the fall. In addition, the site should be reseeded each fall with native grass and forb mix, and early successional annual or biennial species. It is important to note that as this riparian site serves as potential habitat for federally listed bird species such as southwestern willow flycatcher *(Empidonax traillii extimus)*. As such, restoration of this site is a top priority.

Please refer to sections 6 and 7 for detailed restoration and monitoring methodologies.

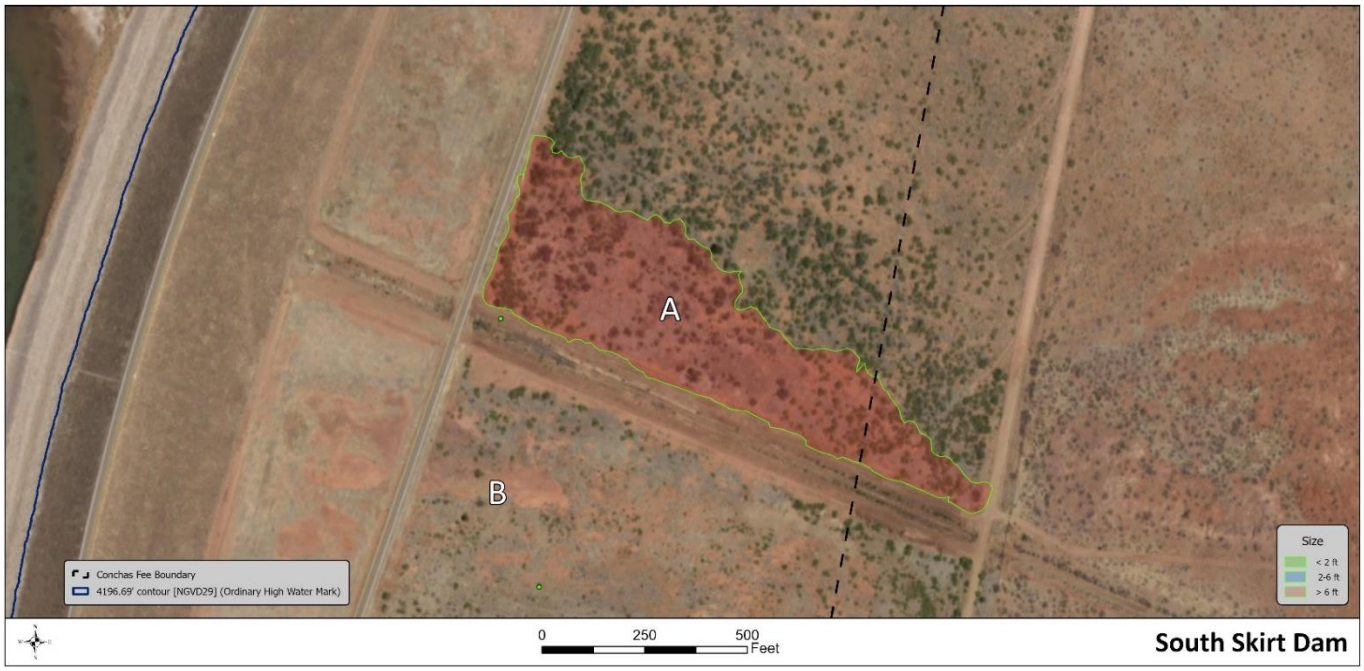
Compliance and Constraints:

This location is immediately downstream of the dam and straddles the river on both sides of the bank. The area within these polygons does not intersect any eligible historic property. However, this is immediately adjacent to the Conchas Dam Historic District and other

resources, so work must be restricted to the areas within these polygons without extending further uphill on either bank. Work in this area would not adversely affect any eligible property.

5.3.3 South Skirt Dam:

The east side of the site can be accessed by vehicle, although most of the site is only accessible to UTV or by foot. The site is infested with mature stands of saltcedar due to consistent access to water caused by seepage of the dam. Native vegetation present includes mesquite, yucca, grasses, and forbs. See Figure 14 for details.



AREA	AREA/SIZE	COVER
A	5.2 ac of saltcedar, > 6' Saltcedar live old growth >3" stem diameter	20% canopy cover. Dense pocket near paved road.
B	Scattered individuals > 6'	Saltcedar live sapling and old growth >3" stem diameter

Figure 14: South Skirt Dam.

Treatment Plan:

Polygons A and B: The recommended treatment types are cut-stump and/or foliar application. Mechanical removal is not recommended as a treatment due to potential destabilization of the slopes and erosion and dam safety concerns. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter.

Please refer to section 4 for a list of detailed treatment methodologies and best management practices, and Table 7 for a list of approved herbicides per treatment type.

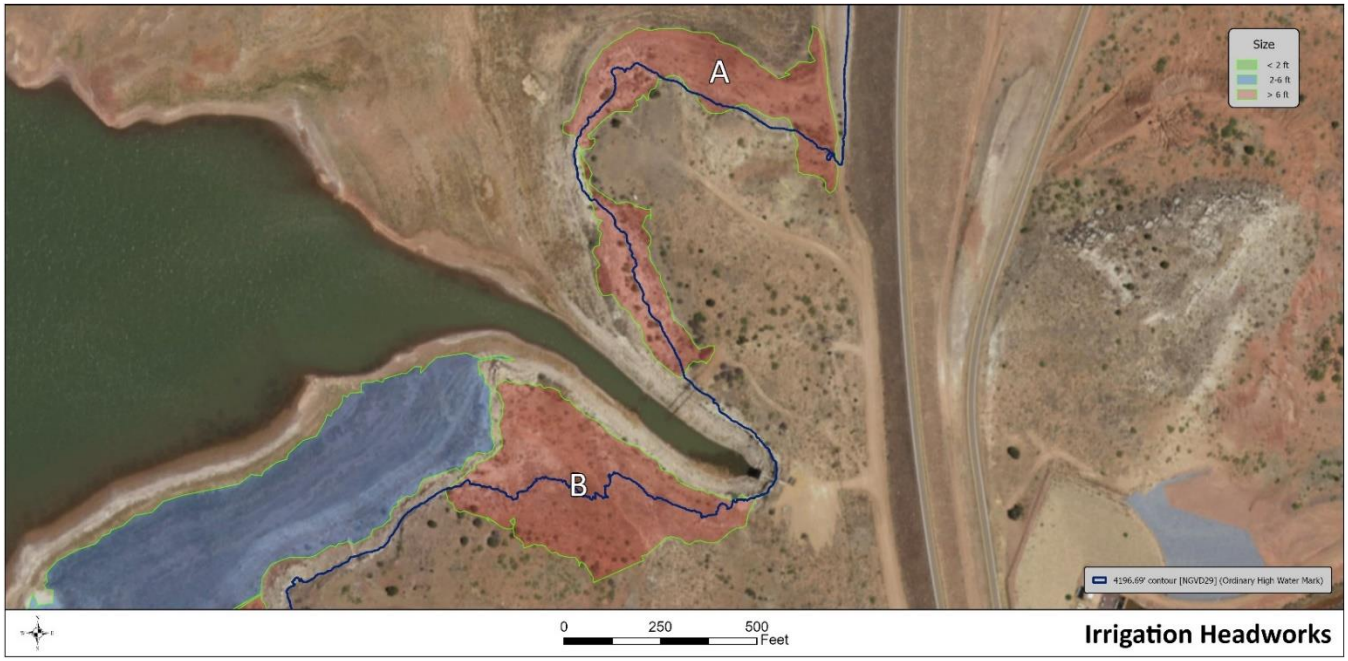
Monitoring and Restoration Plan:

Polygons A and B: Resprouts and seedlings should be retreated on a monthly basis during growing season. In addition, the site should be reseeded each fall with native grass and forb mix, and early successional annual or biennial species.

Compliance and Constraints: While these polygons are immediately adjacent to the Conchas Dam Historic District, there are no limitations related to cultural resources for methods of vegetation removal to be used within these polygons.

5.3.4 Irrigation Headworks:

The east side of the site can be accessed by vehicle, although most of the site is only accessible to UTV or by foot. Native vegetation present includes mesquite, yucca, grasses, and forbs. See Figure 15 for details.



AREA	AREA/SIZE	COVER
A	2.8 ac saltcedar, > 6' tall	live 10% canopy cover. Young adult/saplings <3" stem diameter
B	3.0 ac > 6' tall	Saltcedar live small adults 10% canopy cover. Lots of dieback with sprouts.

Figure 15: Irrigation Headworks.

Treatment Plan:

Polygons A and B: The recommended treatment types are cut-stump for saltcedar >6" in diameter and foliar application for saltcedar <6" in diameter. Mechanical removal is not recommended as a treatment due to potential destabilization of the slopes and erosion and dam safety concerns. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter.

Please refer to section 4 for a list of detailed treatment methodologies and best management practices, and Table 7 for a list of approved herbicides per treatment type.

Monitoring and Restoration Plan:

Polygons A and B: Resprouts and seedlings should be retreated on a monthly basis during growing season. In addition, the site should be reseeded each fall with native grass and forb mix, and early successional annual or biennial species. Seed and plant willow and cottonwood poles in the fall.

Compliance and Constraints: While these polygons are immediately adjacent to the Conchas Dam Historic District, there are no limitations related to cultural resources for methods of vegetation removal to be used within these polygons.

5.4 Upland Recreation Areas and Wildlife Management Areas

5.4.1 Big Mesa/Highway 104:

The site can be accessed by vehicle, although most of the site is only accessible to UTV or by foot. Native vegetation present includes grasses, forbs, some shrubs, yucca, and opuntia. See Figure 16 for details.

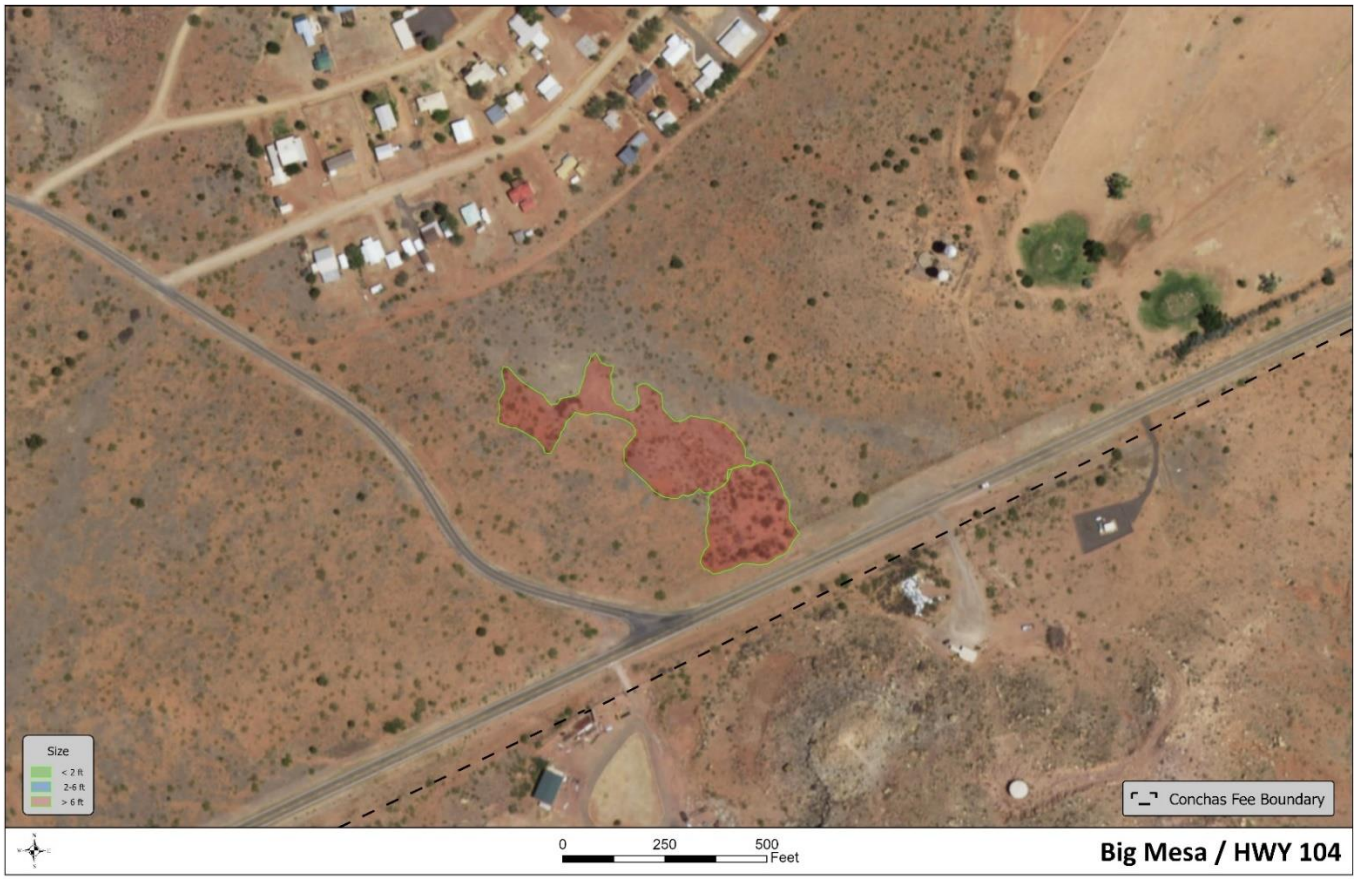


Figure 16: Big Mesa/Highway 104.

Treatment Plan:

Polygons A and B: The recommended treatment types are cut-stump for saltcedar >6” in diameter and foliar application for saltcedar <6” in diameter. Mechanical removal may also be considered as a treatment for this area. Treatment should be conducted in the fall (September – October) when plants begin storing nutrients prior to winter.

Monitoring and Restoration Plan:

Polygons A and B: Resprouts and seedlings should be retreated on a monthly basis during growing season. In addition, the site should be reseeded each fall with native grass and forb mix, and early successional annual or biennial species.

Currently, invasive species are not widespread within upland recreation areas and wildlife management areas elsewhere at the Project. The Project plans to resurvey vegetation plots throughout these areas every 3-5 years in order to assess changes within these areas over time and to monitor for and treat invasive species infestations. See sections 6 and 7 for details on monitoring and restoration activities.

Compliance and Constraints:

There are no restrictions on methods regarding protection of cultural resources or historic properties in this location.

5.5 Environmentally Sensitive Areas

Environmentally Sensitive Areas are areas where scientific, ecological, cultural, or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act or applicable state statues. These areas must be managed to ensure they are not adversely impacted. See Figure 5 for locations of Environmentally Sensitive Areas throughout the Conchas Lake Project.

Currently, invasive species are not widespread within Environmentally Sensitive Areas. The Project plans to resurvey vegetation plots throughout these areas every 3-5 years in order to assess changes within these areas over time and to monitor for and treat invasive species infestations.

Consultation under Section 106 with SHPO and Tribes for use of the following methods within ESAs was conducted in November of 2024 (Historic Preservation Division Log # 123954; SHPO concurrence received November 27, 2024). Any work not conforming to these restrictions must undergo further compliance work, possibly including consultation, before implementation. The PA governing Section 106 compliance at Operations projects may also include standard procedures for managing vegetation within archaeological sites, which may be used in the furtherance of this management plan.

Within ESAs, in general, vegetation work is likely to have no adverse effect to historic properties as long as the work adheres to the following restrictions:

- Hand cutting and/or removal only within archaeological or cultural site boundaries, including hand-carrying of removed vegetation away from site. Site presence and boundaries must be determined by a qualified archaeologist following any stipulations or guidelines present in the PA, including the determination of whether updated survey is required
- No islands of vegetation should be left behind that may indicate the location or presence of an archaeological site to the public
- Any staging of equipment and/or pile burning of removed vegetation must occur well outside of site boundaries
- No ground disturbance (including tilling) within site boundaries for reseeding purposes

5.6 Out-granted Areas

Out-grantees are encouraged to use the methods approved within this plan. However, it is required that out-grantees fist consult with USACE by providing a detailed description of work to be conducted, including: location (map), methodology, and a Pesticide Management Plan (see section 4.2 and template in Appendix 3).

Section 106 consultation with SHPO and with Tribes in 2024 cleared the use of this vegetation management plan by out-grantees as well as USACE personnel, provided that determinations about the locations of eligible historic properties are made by a qualified USACE archaeologist (per HPD Log # 123954). USACE will provide out-grantees with appropriate maps showing where any cultural resources avoidance areas may be located, and/or what areas may need to use particular methods to avoid adverse effects to historic properties. See Figure 5 for locations of out-grants throughout the Conchas Lake Project.

6 Restoration Practices

6.1 Planting Dormant Pole and Whip Cuttings

Planting dormant cuttings is an effective technique for establishing many riparian tree and shrub species. Detailed methods for selecting, caring for, and planting dormant cuttings are provided in "*The Pole Cutting Solution"* Guidelines for Planting Dormant Pole Cuttings in Riparian Areas of the Southwest (NRCS, no date) and "Suggested Methodologies for Cottonwood Pole, Willow Whip and Longstem Plantings" (Tamarisk Coalition, 2014).

Cottonwood poles should be sourced locally if possible. Conchas Lake does not have an abundance of cottonwood, so cuttings may need to be obtained from neighboring landowners, other agencies, other USACE projects, or commercial sources. Poles are typically cut 12-16 feet long and 2-3 inches in diameter. Vigorous young poles with larger diameters establish more successfully than older or smaller diameter poles. Pole cuttings are harvested and planted while dormant (winter to early spring); approximately February time frame, when the ground is not too wet and not frozen. The cut ends must be kept in water to keep the poles hydrated between harvest and planting, although they may be out of the water briefly during transport. For willows, vigorous young stems ("whips") are cut and treated in a similar manner.

The key advantage of pole and whip planting is that cuttings are kept hydrated after planting by the stump end being in contact with ground water. Cuttings become established through the proliferation of adventitious roots in the capillary fringe above the water table. Therefore, planting depth is critical and must be determined on a site-by-site basis. The depth of the planting hole must be sufficient for the stump end of the pole to be in ground water throughout the growing season even if the water table drops. This presents a challenge for pole plantings along the shore of a reservoir with fluctuating water levels. If extreme fluctuations in ground water level are expected, the pole needs to be planted below the water table to ensure that the capillary fringe will surround the butt end of the pole during periods of maximum ground water depth. Pole cuttings should be of sufficient length to extend into the water table and leave a substantial aboveground stem (at least 5 ft.).

Augers (either hand-operated or truck or tactor mounted) or stinger implements are typically used to plant cottonwood or tree willow poles, while willow whips can also be planted using a water jet or 3-foot-long rotary hammer drill bit. Another potential method is using a backhoe to excavate a larger hole or trench. The "super trench" methodology developed by the U.S. Army Engineer Research and Development Center (ERDC) uses a backhoe or similar equipment for planting dormant cuttings in quantity and at high density.

Test soils before planting to verify that salinity levels throughout the soil profile are below threshold limits for establishment of cottonwoods and willows. If soils are saline below the surface, species as fourwing saltbush (*Atriplex canescens*) or pale wolfberry (*Lycium pallidum*) may be better suited to the site.

Protect willows and cottonwoods from herbivory with wire fencing. Fencing should be at least 4-5 feet tall with a 2x4 or 4x4 inch mesh size, leaving some space between the trunk and the fence so beavers cannot reach the tree.

6.2 Container Plantings

Other riparian shrubs such as New Mexico olive (*Forestiera pubescens*), false indigo (*Amorpha fruticosa*), and seepwillow or false willow (*Baccharis* species) may be planted in areas that experience too much water-level fluctuation for cottonwoods, or to increase diversity. These should preferably be longstem plants, planted deeply so the root ball is in contact with moisture. See "Deep Planting, the Groundwater Connection: Guidelines for Planting Longstem Transplants for Riparian Restoration in the Southwest" (NRCS Los Lunas Plant Materials Center, n.d.) for details.

6.3 Seeding

Herbaceous species (grasses and forbs) should be seeded in areas such as shorelines, dam toes, any newly disturbed areas, formerly disturbed areas such as utility lines or roads that we want to decommission, etc. For detailed seeding methods and considerations se "Seeding Native Grasses in the Arid Southwest" (NRCS Los Lunas Plant Materials Center, no date).

The soil in areas to be seeded should be tilled to at least 4 inches or have 4 inches of topsoil added. Debris or stones should be removed. Steep areas may be hydroseeded, but it is preferable to drill seed native species. If seed is broadcast, it must be covered to the proper depth. Provide micro-topography by discing along the contour lines or using an imprinter or similar implement. Do not seed when ground is muddy, frozen, snow covered, or otherwise in an unsatisfactory condition for seeding.

Proper seed depth varies from 1/8" deep to 1/4" deep. In sandier soils, deeper burial of seed (up to ½" deep) is preferred for most grass seed. In general, the smaller the seed (such as many small wildflower/forb seeds) the shallower it should be buried. Grass seed is often buried ¼" deep. If the mix has a high degree of small seeded species, those seeds must be sowed separately (broadcast on the soil surface prior to roller compacting, or no deeper than 1/8 – 1/16"), or in a separate seed drill hopper in order to ensure that seed is not buried too deep. Whether seed is drilled or broadcast, it should be covered using a drag harrow, packer wheels, rakes, chains, or other effective means. Seeded sites should be rolled or tamped sufficiently to firm the soil over the seed. Small areas can be walked upon to tamp the soil after seeding. The exact means of covering seed will vary depending on the method of seeding, site constraints, and equipment available.

All areas installed with seed must be covered by mulch or other soil surface protection treatments within 72 hours of seeding, or within 24 hours after seeding if rains are possible. Mulch should be spread by hand, blower-type mulch spreader or similar methods and must be anchored immediately following spreading by crimping. Hay or straw should be applied uniformly at depth of 2"-3" and at a rate of two tons (4,000 lbs)/acre and crimped into the ground to prevent removal by wind. The mulch must not be bunched or clumped, and sunlight must be able to penetrate to the ground surface.

Seed mixture may be based on NMDOT or USACE seeding lists, and preferably will include species most frequently encountered in vegetation sampling. Forbs (wildflowers) should be included in the seed mix. Shrubs such as featherplume, chamisa, fourwing saltbush, baccharis, or any other shrub found locally may be added to seed mixes if the area being restored is suitable for shrubs.

A partial list of grass and forb species observed during vegetation monitoring is provided below (Table 8).

Table 8: Grass and forb species for seeding at Conchas Lake

Upland Grass	*Aristida purpurea*	purple threeawn
Upland Grass	*Bothriochloa laguroides*	silver beardgrass
Upland Grass	*Bouteloua curtipendula*	sideoats grama
Upland Grass	*Bouteloua eriopoda*	black grama
Upland Grass	*Bouteloua gracilis*	blue grama
Upland Grass	*Elymus elymoides*	Squirreltail
Upland Grass	*Muhlenbergia arenicola*	Sand muhly
Upland Grass	*Muhlenbergia porteri*	bush muhly
Upland Grass	*Muhlenbergia toreyi*	Ring muhly
Upland Grass	*Pleuraphis jamesii*	galleta
Upland Grass	*Schizachyrium scoparium*	little bluestem
Upland Grass	*Setaria leucopila*	Plains bristlegrass
Upland Grass	*Sporobolus airoides*	alkali sacaton
Upland Grass	*Sporobolus cryptandrus*	sand dropseed
Upland Grass	*Tridens muticus*	slim tridens
Upland Forb	*Asclepias latifolia*	Broadleaf milkweed
Upland Forb	*Asclepias subverticellata*	whorled/horsetail milkweed
Upland Forb	*Berlandiera lyrata*	lyreleaf greeneyes (chocolate flower)
Upland Forb	*Calylophus lavandulifolius*	Lavenderleaf sundrops
Upland Forb	*Chaetopappa ericoides*	rose heath
Upland Forb	*Dalea purpurea*	purple prairie clover
Upland Forb	*Engelmannia peristenia*	Engelmann daisy
Upland Forb	*Glandularia bipinnatifida*	Dakota mock vervain
Upland Forb	*Machaeranthera pinnatifida*	lacy tansyaster
Upland Forb	*Machaeranthera tanacetifolia*	tanseyleaf tansyaster
Upland Forb	*Melampodium leucanthum*	blackfoot daisy
Upland Forb	*Psilostrophe tagetina*	paperflower
Upland Forb	*Senna bauhinioides*	twinleaf senna
Upland Forb	*Sphaeralcea coccinea*	Scarlet globemallow
Upland Forb	*Tetraneuris argentea*	perkysue
Upland Forb	*Tetraneuris scaposa*	four-nerve daisy
Upland Forb	*Thelesperma megapotamicum*	greenthread
Upland Forb	*Zinnia grandiflora*	Plains zinnia
Riparian/Shoreline Grass	Bothriochloa ischaemum	Silver bluestem
Riparian/Shoreline Grass	*Chloris verticillata*	Windmillgrass
Riparian/Shoreline Grass	*Distichlis spicata*	saltgrass
Riparian/Shoreline Grass	*Hordeum jubatum*	Foxtail barley
Riparian/Shoreline Grass	*Panicum obtusum*	vine mesquite
Riparian/Shoreline Grass	*Sporobolus airoides*	alkali sacaton
Riparian/Shoreline Grass	*Sporobolus cryptandrus*	sand dropseed
Riparian/Shoreline Forb	Phyla cuneifolia or nodiflora	frogfruit
Riparian/Shoreline Forb	Senecio flaccidus	threadleaf ragwort
Riparian/Shoreline Forb	Senna bauhinioides	twinleaf senna

7 Vegetation Survey and Monitoring

The most useful monitoring programs help managers achieve long-term management objectives by generating relevant data. Consequently, it is essential to clearly define both management and monitoring objectives before designing a monitoring program (Herrick et al., 2009). Monitoring data can be used to evaluate the effects of past management, confirm effective management practices, identify trends that can be used to predict future changes so management can be adapted accordingly, and to learn more about how different factors (drought, fire, management) affect the land.

7.1 Baseline Survey – Existing Conditions

Where possible, pre-treatment baseline data should be collected prior to treatment implementation in order to document and describe conditions prior to management action. Following treatment, monitoring activities should generally occur at the same time of year each time they are performed in order to maintain consistency in plant phenology by season and reduce "noise" in the data that may result from variations in seasonal plant expression.

Baseline monitoring data will be used to:

- Establish reference state current condition;
- Develop vegetation treatment and monitoring objectives;
- Evaluate the effects of current and future management;
- Detect change and identify trends that can be used to inform management practices via the science-based adaptive management approach; and
- Learn how various factors may impact natural habitats.

Invasive Plant Surveys – Mapping

Vegetation maps provide enormous amounts of data on plant species abundance and distribution, as well as associated data on topography and environment, in formats that readily inform planning decisions, assist research projects, and improve resource management.

After initial data collection and the creation of baseline maps, long-term monitoring of vegetation communities will help land managers and researchers better understand the dynamic nature of ecosystems and the processes that control them. Completed vegetation maps are currently being utilized by land managers across the country for purposes of Research, Fire Management, Planning, and Natural Resource Management.

The saltcedar treatment maps described in Section 5 of this plan were produced following the general mapping protocol describe below. For further detail please refer to Appendix 1 – Conchas Dam Inventory & Monitoring Report.

Invasive Plant Delineation

Each delineation on a vegetation map shows the boundaries, shape and location of a landscape unit (polygon) composed of 1-3 dominant plant species of consistent age/size class within the unit. The individual bodies (polygons) of said plant community are large enough to be delineated at the scale of mapping. Several to numerous individuals of each species and size class are apt to occur in each delineation, and they occur in a fairly repetitive and describable pattern.

Saltcedar and other invasive species populations are mapped by age/size class with reference to density/cover, live/dead status, and native plant community composition & %Cover. Plant community characteristics are documented for each polygon mapped as follows:

Table 9: Field Maps App geospatial data collection (mapping) should be set up following this table to create drop down menus as described.

Polygon ID	**Species ID**	**Live/Dead Status**	**Age**	**Height**	**% Cover** (*Relative to entire polygon*)	**Native Plant Species Cover & Composition**
			<1" DRC - Seedling	<2'		
		L	1-6" DRC - Sapling	2-6'		
		D	>6" DRC - Old Growth	>6		
Auto-generated	Choose code from plant list	Drop-down menu	Drop-down menu (3 options as listed above)	Drop-down menu (3 options as listed above)	Alpha numeric comment field	Alpha numeric comment field

Permanent Monitoring Plots

Section 3.4 of this plan describes the existing conditions of various plant communities within the USACE fee boundary. To aid in the ground truthing of descriptions referenced in the Natural Resource Level I Inventory, baseline vegetation data was collected and summarized. The Conchas Dam Inventory and Monitoring Report describes, in sufficient detail for replication, the methodology used to conduct baseline surveys and summarizes the full suite of results by monitoring site.

The objectives of the Conchas Dam Permanent Monitoring Plot (Line-Point Intercept) Baseline Survey were to collect baseline data from healthy habitats which are native and relatively undisturbed. These areas will serve as reference conditions for restoration areas and will also serve as baseline data for future monitoring to be analyzed against in order to capture long term changes.

Data Collection plots were stratified by Land Use Classification as defined in the 2022 Conchas Master Plan. Plot locations within each Land Use Classification were further stratified by vegetation classification as defined in the Conchas Dam Natural Resource Level 1 Inventory and plotted randomly.

The data obtained from this baseline survey was used to define and describe the following plant community characteristics:

- Community Composition
  - Species inventory – presence/absence
- Species Frequency
  - Abundance data by species
- Cover/Density
  - Total Percent Canopy Cover
  - Percent Canopy Cover by Functional Group (Tree, Shrub, Grass, Forb, etc.)
  - Percent Canopy Cover by Species

    - Percent Cover of Non-Native/Introduced/Noxious/ Invasive plant species
- Plant Community Diversity
    - Species Richness
    - Species Evenness
    - Species Diversity

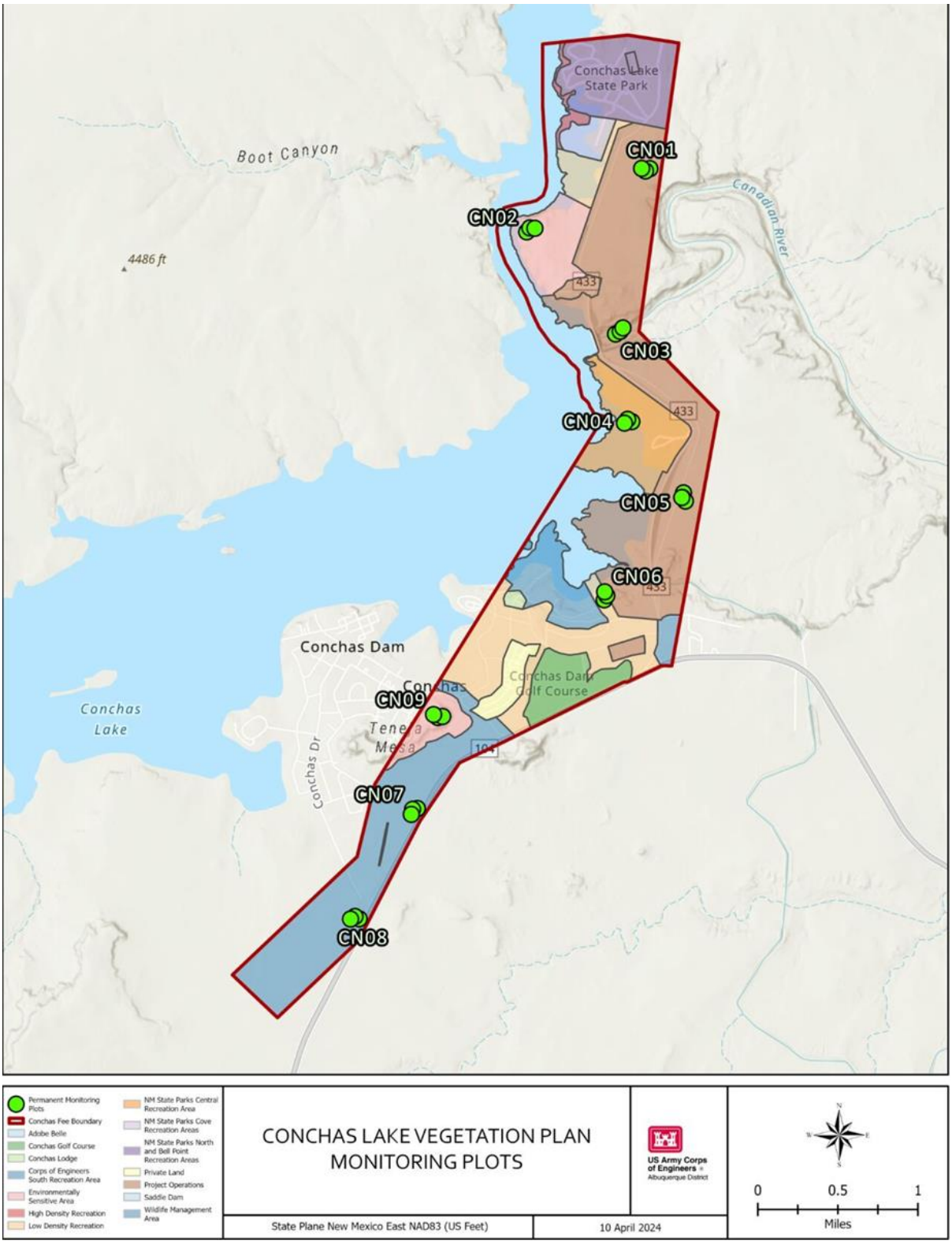


Figure 17: Permanent Monitoring Plot locations overlayed on Land Use Classifications within Conchas Dam Fee Boundary.

For a full detail of methods and baseline results summary, please refer to Appendix 1 – Conchas Dam Inventory & Monitoring Report.

7.2 Treatment & Monitoring Objectives

Table 10 describes the objectives for each treatment recommended for the various management units listed in Section 5 of this plan. The associated monitoring plans will be used to determine if such objectives are being met and if so, to what degree. The monitoring results should be used to inform future treatment/management actions.

The associated Monitoring Objectives identify the monitoring methodology and, therefore, the information that is acquired via the identified monitoring method. This information should be used to determine if the invasive plant treatments are effective at meeting the outlined treatment objectives. Management actions shall then adapt accordingly to these findings.

Treatment efforts should be monitored annually for the first 10 years following implementation.

Table 10: Invasive Species Plan Treatment & Monitoring Objectives

Management Area	Site	Subsite	Treatment	
Project Operations	Below Dam	NA	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application; Mechanical Removal
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Project Operations	South Skirt Dam	NA	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application; Mechanical Removal
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Project Operations	Irrigation Headworks	A	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Project Operations	Irrigation Headworks	B	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	South Campground shore	A	Treatment Objectives	Eradicate Invasive Plants: Mechanical Removal (root grubbing "scraping")
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	South Campground shore	B, C, D, E	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application; Mechanical Removal
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	Ranger Station cove	A, C,	Treatment Objectives	Eradicate Invasive Plants: Mechanical Removal (root grubbing "scraping")
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of Invasive Plant Populations: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	Ranger Station cove	E, F	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application; Mechanical Removal
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	Ranger Station cove	G	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application; Mechanical Removal

			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	Ranger Station cove	B, D, H, I	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application; Mechanical Removal
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	Boat launch peninsula	NA	Treatment Objectives	Eradicate saltcedar: Foliar Herbicide Application; Mechanical Removal
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	Juniper D. U. shoreline and Lodge	NA	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	Cannon Cove	NA	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Upland Rec/Wildlife Areas	Big Mesa-104	NA	Treatment Objectives	Eradicate saltcedar: Cut-Stump Method; Foliar Herbicide Application
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report

Success Criteria

Plant community characteristics following **treatment and restoration** should generally be similar to those identified in our reference sites as described in Section 3 and detailed in Appendix 1 – Conchas Dam Inventory & Monitoring Report.

In addition to eradicating or significantly reducing invasive plant populations, we shall aim to achieve native plant composition and cover that is represented in mature, healthy native plant communities within the fee boundary. Below is a summary table describing the plant community characteristics identified as reference conditions from the baseline sampling of the permanently installed monitoring plots referenced in Section 7.1.

Table 11: Plant Community Characteristics for Baseline Reference Sites

Site	CN01	CN02	CN04	CN05	CN06	CN07	CN08	CN09
Species Richness	9	22	12	8	21	13	11	15
Species Diversity	0.93	2.62	1.88	1.37	2.8	1.7	1.9	2
% Canopy Cover	86%	81%	57%	111%	66%	75%	90%	85%
% Introduced Plant Cover	0%	0%	27%	9%	3%	0%	1%	0%
Land Use Classification	Project Ops	Env. Sensitive Area	High Density Rec.	Project Ops	Low Density Rec.	Wildlife Mgmt. Area	Wildlife Mgmt. Area	Env. Sensitive Area
Observed Habitat	Dry mesquite shrub and grassland	Dry juniper shrub and grassland	Shoreline fluctuations	Lowland Native-Introduced Mesquite-Saltcedar Riparian Scrub /dry shrub and grassland	Rocky Outcrop Juniper sparse shrubland (modified-previously inundated)	Mesquite shrub and grassland	Mesquite shrub and grassland	Mesquite shrub and grassland
Plant Community-Group, Alliance or Association	Blue Grama - Galleta Semi-Desert Grassland Association	One-seed Juniper shrubby woodland, One-seed Juniper/ Rockland Woodland, or One-seed Juniper/ Black Grama Open Woodland	Open Channel Riverwash/ Water/Unvegetated Bars (NMRIP). (No described NVCS class.)	Western Great Plains Mesquite Scrub Woodland and Shrubland Ecological System (invaded by saltcedar at this location).	*Juniperus monosperma* Grassy Woodland Alliance (USNVC) Great Plains Lowland Salt Meadow and Dry Grassland (NMRIP)	James' Galleta Grassland	Honey Mesquite / Black Grama Ruderal Shrub Grassland	Honey Mesquite / Exotic Grass Ruderal Shrubland (*note: although named 'exotic grass', this association has native blue grama as its most prevalent grass).

7.3 Restoration & Monitoring Objectives

Table 12 describes the objectives for each restoration practice recommended for the various management units listed in this plan. The associated monitoring plans will be used to determine if such objectives are being met and if so, to what degree. The monitoring results should be used to inform future treatment/management actions.

The associated Monitoring Objectives identify the monitoring methodology and, therefore, the information that is acquired via the identified monitoring method. This information should be used to determine if the restoration actions have been effective at meeting the outlined restoration objectives. Management actions shall then adapt accordingly to these findings.

Restoration efforts should be monitored annually for the first 10 years following implementation.

Table 12: Vegetation Restoration & Monitoring Objectives

Management Area	Site	Subsite	Restoration	
Project Operations	Below Dam	NA	Restoration Objectives	Restore to native riparian plant community (provde Willow Flycathcer Habitat): Plant native riparian willows and cotton woods; seed native riparian understory
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population; Overstory Monitoring Protocol for Native Plantings
Project Operations	South Skirt Dam	NA	Restoration Objectives	Native Plant Seeding; allow natural regeneration of native community
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of Saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Project Operations	Irrigation Headworks	A	Restoration Objectives	N/A
			Monitoring Objectives	N/A
Project Operations	Irrigation Headworks	B	Restoration Objectives	N/A
			Monitoring Objectives	N/A
Shoreline Rec Area	South Campground shore	A	Restoration Objectives	Re-seed in low water years
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	South Campground shore	B, C, D, E	Restoration Objectives	Restore to native riparian plant community: Plant native riparian willows and cotton woods; seed native riparian understory
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population; Overstory Monitoring Protocol for Native Plantings
Shoreline Rec Area	Ranger Station cove	A, C,	Restoration Objectives	Re-seed in low water years
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of Invasive Plant Populations: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	Ranger Station cove	E, F	Restoration Objectives	Restore to native riparian plant community: Plant native riparian willows and cotton woods; seed native riparian understory

			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population; Overstory Monitoring Protocol for Native Plantings
Shoreline Rec Area	Ranger Station cove	G	Restoration Objectives	Restore to native plant community: Plant native upland species; seed native understory
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population; Overstory Monitoring Protocol for Native Plantings
Shoreline Rec Area	Ranger Station cove	B, D, H, I	Restoration Objectives	Restore to native plant community: Plant native upland species; seed native understory
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population; Overstory Monitoring Protocol for Native Plantings
Shoreline Rec Area	Boat launch peninsula	NA	Restoration Objectives	Re-seed in low water years
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Shoreline Rec Area	Juniper D. U. shoreline and Lodge	NA	Restoration Objectives	Restore to native plant community: Plant native upland species; seed native understory
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population; Overstory Monitoring Protocol for Native Plantings
Shoreline Rec Area	Cannon Cove	NA	Restoration Objectives	Native Plant Seeding; allow natural regeneration of native community
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report
Upland Rec/Wildlife Areas	Big Mesa-104	NA	Restoration Objectives	Native Plant Seeding; allow natural regeneration of native community
			Monitoring Objectives	Geospatial Survey (GIS Mapping) of saltcedar population: Follow "Invasive Plant Delineation" Protocol from Conchas Dam I&M Report

Pole-Planting (Overstory) Monitoring Protocol

For pole-planting monitoring methodology please refer to Section 6.1. This section will describe how to log/record pole planting information for use as baseline data to compare against and how follow-up monitoring should be conducted.

The objective of monitoring pole plantings is to identify their growth and success rate to identify future management actions in support of the restoration objectives.

Plantings should be monitored annually for the first 10 years. Monitoring activities should generally occur at the same time of year each time they are performed to maintain consistency in plant phenology by season and reduce “noise” in the data that may result from variations in seasonal plant expression.

Appendix 2 – Conchas Dam Overstory Monitoring Data Sheet can be used to log and monitoring pole plantings as well as future sprouts and natural regeneration. This data sheet may be modified as needed.

8 References

Brown, E.J. (2014). *Archaeological Survey of 1899 Acres at Conchas Lake, San Miguel County, New Mexico.* Aspen CRM Solutions, Inc., Santa Fe.

Herrick, J. E., Van Zee, J. W., Havstad, K. M., Burkett, L. M., & Whitford, W. G. (2009). *Monitoring manual for grassland, shrubland, and savanna ecosystems: Volume I*. *Quick start* (Vol. 1). USDA Agricultural Research Service.

Muldavin, E., Milford, E., Leonard, J., Triepke, J., Elliott, L., Hanberry, P., Diamond, D., Smith, J., Reasner, C., Chauvin, Y., & Urbanovsky, A. (2021). *New Mexico riparian habitat map NMRipMap project summary*. Natural Heritage New Mexico. https://nhnm.unm.edu/riparian.nmrip

National Oceanic and Atmospheric Administration. (2024). *Short-duration outlooks summary*. Retrieved October 24, 2024, from https://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.phpNatureServe. 2024. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: May 30, August 4, November 8, 2024).

Natural Resources Conservation Service (NRCS). (n.d.) *The Pole Cutting Solution: Based on two decades of technology development at the Los Lunas Plant Materials Center. Guidelines for Planting Dormant Pole Cuttings in Riparian Areas of the Southwest.* Retrieved from https://allaboutwatersheds.org/library/general-library-holdings/polecutting.pdf/view on 13 November 2024.

NRCS. (n.d). *Deep Planting, the Groundwater Connection: Guidelines for Planting Longstem Transplants for Riparian Restoration in the Southwest*. NRCS Los Lunas Plant Materials Center. Retrieved from https://www.nrcs.usda.gov/plantmaterials/nmpmcrj9703.pdf on 13 November 2024.

New Mexico Office of Cultural Affairs, Historic Preservation Division (NMHPD) (2006). State Register of Cultural Properties: http://www.nmhistoricpreservation.org/PROGRAMS/registers_statenatl.html.

Schelberg, J.D. & Everhart, G.D. (2000). *draft National Register of Historic Places Nomination Form: Conchas Dam Historic District*. Report on File, U.S. Army Corps of Engineers, Albuquerque District, Albuquerque.

Schelberg, J.D. & Stone, J. (2005). *National Register of Historic Places Nomination Form: Conchas Dam Historic District*. (Conchas Dam Historic District was listed on the National Register of Historic Places on May 22, 2005). Report on File, U.S. Army Corps of Engineers, Albuquerque District, Albuquerque.

Tamarisk Coalition (2014). Suggested Methodologies for cottonwood pole, willow whip and longstem plantings. Grand Junction, CO. Retrieved November 8, 2024 from https://riversedgewest.org/sites/default/files/2022-06/Cottonwood_Willow_Cutting_Guide.pdf.

Turnbow, C.A. & Cribbin, B. (2008). *A Cultural Resources Survey of the Conchas Southside Recreation Area, San Miguel County, New Mexico*. University of New Mexico Office of Contract Archeology Project No. 185-903, Albuquerque.

U.S. Army Corps of Engineers (USACE). 2020. *Routine vegetation management plan.* USACE, Albuquerque District internal document (Final_PMP_Routine Vegetation Management Plan_August2020.pdf).

U.S. Army Corps of Engineers. (2019). *Guidelines for landscape planting and vegetation management at levees, floodwalls, embankment dams, and appurtenant structures* (EP 1110-2-18). https://www.publications.usace.army.mil/Portals/76/Users/182/86/2486/EP_1110-2-18.pdf?ver=bVt-L-DvQrASeFS6szPNaw%3D%3D

U.S. Environmental Protection Agency. (2024a). *Construction general permit resources, tools, and templates.* Retrieved October 24, 2024, from https://www.epa.gov/npdes/construction-general-permit-resources-tool-and-templates

U.S. Environmental Protection Agency. (2024b). *Ecoregions homepage*. Retrieved August 3, 2024, from https://www.epa.gov/eco-research/ecoregions-north-america

U.S. Environmental Protection Agency. (2024c). *Landscape Ecology Workbench (LEW) homepage*. Retrieved October 24, 2024, from https://lew.epa.gov

U.S. Fish and Wildlife Service (2024). Information for Planning and Consultation (IPaC). Web application available at: https://ipac.ecosphere.fws.gov/ (accessed: October 30, 2024).

U.S National Vegetation Classification (USNVC) (2024). https://usnvc.org/ (accessed in August 2024).

Van Citters, K. (2001). *Preservation and Maintenance Plan for the Conchas Dam Historic District, New Mexico*. OCA/UNM Report No. 185-702. Office of Contract Archeology, University of New Mexico, Albuquerque.

Wiken, E., Jiménez Nava, F., & Griffith, G. (2011). *North American terrestrial ecoregions descriptions — Level III.* Commission for Environmental Cooperation. https://gatfp.epa.gov/EPAADataCommons/ORD/Ecoregions/pubs/NA_TerrestrialEcoregionsLevel3_Final-2june11_CEC.pdf

9 Appendices

Appendix 1: Conchas Dam Vegetation Inventory & Monitoring Report

Appendix 2: Conchas Dam Overstory Monitoring Data Sheet

Appendix 3: Albuquerque District Pesticide Control Plan and Pesticide Reporting Form