

Rio Grande Bosque Habitat Restoration Action Plan:

Short-term Plan and Recommendations for a Long-term Restoration Action Plan

Summary

The Rio Grande Bosque Habitat Restoration Action Plan (RAP) is focused on short-term actions that can be implemented over the next six months, along with recommendations for a longer RAP over a two-year period following the Rio Grande Bosque Wildfire Mitigation Project at specific locations identified as Units in the Rio Grande Valley State Park. The plan will focus on planting native grasses, forbs, and woody plant species to promote a diversity of wildlife habitats.

Background and Area Description

The City of Albuquerque Open Space Division (OSD) manages the Rio Grande Valley State Park through a Joint Powers of Agreement with the Middle Rio Grande Conservancy District and through the Rio Grande Valley State Park Act. The City of Albuquerque and Ciudad Soil and Water Conservation District (CIUDAD) recently implemented a forest health initiative. The City's Albuquerque Fire and Rescue and Open Space Division secured a nearly \$1,000,000 FEMA grant in 2019 to support a wildfire mitigation project to reduce the severity of catastrophic wildfires, support overall forest health, and protect infrastructure of significant value including public facilities such as the Abq. BioPark and National Hispanic Cultural Center. The City completed the first phase of the project by working with SWCA Environmental Consultants on a comprehensive Environmental Assessment and project plan that FEMA approved in September 2023. The second phase of the grant was to implement the project plan that was managed by CIUDAD, which occurred from December 2023 until April 2024.

The total project area is 470 acres on both the west and east sides of the Rio Grande, south of Bridge Boulevard to north of Central Avenue. However, only 193.5 acres were treated in 14 Units (Appendix A) during implementation—around 4% of the total area the Open Space Division manages within the Rio Grande Valley State Park. The project area is where wildland fires have the most occurrences within the Bosque. In the last five years, the number of fire incidents that the Albuquerque Fire and Rescue has responded to in the area has more than doubled—from 86 incidents in 2019 to 235 in 2023. One of the greatest threats to the Bosque ecosystem is the threat of fire since it's not fire-adapted, which is exacerbated as the area continues to experience persistent droughts. Reducing the likelihood and severity of a high-level disturbance such as fire is vital to keeping the Bosque habitat intact for wildlife and community benefit. The project focused on removing non-native species of plants as well as thinning understory ladder fuels under large majestic Cottonwood trees and removing downed wood. Invasive plants plague the Bosque, resulting in several negative impacts, including reducing plant and animal biodiversity, out-competing native plants well adapted to the climate, reducing water availability, and reducing soil health. These plants proliferate and establish dense colonies, contributing to hotter and more intense fires in the forest. Following the wildfire mitigation plan, it is an opportune time to reestablish native vegetation that invasive plants displaced so that animals adapted to long-established habitats can thrive, resulting in greater diversity and ecosystem resiliency.

Project Purpose and Considerations

The Rio Grande Bosque Wildfire Mitigation Project identified five considerations for planting native plants. The project plan stated the following:

Following hazardous fuel mitigation treatments, planting of indigenous vegetation will occur to enhance habitat value for residents and migratory wildlife and to remove nonnative trees and understory, depending on site conditions. Native species to be planted would include Rio Grande cottonwood, Goodding's willow (*Salix gooddingii*), narrowleaf (coyote) willow (*Salix exigua*), New Mexico olive (*Forestiera neomexicana*), pale desert-thorn (wolfberry) (*Lycium pallidum*), and other native shrubs, forbs and grasses. Native plantings would be considered in the following situations:

1. Where understory vegetation is removed or masticated in high-priority treatment areas
2. Where plantings would not compromise visibility or access necessary for safe wildfire suppression
3. Where bare ground exists within treatment units to establish cover and prevent/mitigate invasive weeds, etc.
4. Where reseeding grasses and low growing shrubs would create open forest habitats for foraging birds and defensible space.
5. Where user-defined, social trails or vehicle/equipment tracks need to be restored

In addition to these general considerations, the Open Space Division collaborated with partners to identify opportunities and objectives of the RAP to further support diverse wildlife habitats. Several challenges must be considered in developing short- and long-term plans, including persistent drought and climate change, diminishing ground and surface water, and the proliferation of exotic and invasive species. The Rio Grande Bosque is a dynamic system that has always and will continue to change; however, this is especially challenging as we consider the future of the Bosque in light of climate change and the fact that our Cottonwood gallery forest is older and closer to the end of its life cycle. The future Bosque will most likely include cottonwood trees, but it will likely not be the continuous Cottonwood forest we know today. The question is how to come to terms with our changing climate and ecosystem, work towards resiliency, and promote different types of habitats that will continue to serve wildlife and be more resilient into our climate future.

Additional considerations based on input from partners and staff include the following:

- Incorporate native plants that are known to provide high value for a variety of wildlife, known to be adapted to, or their range includes the Bosque, may be drought-resistant, and may serve as future canopy trees. Plant stock should include the following when possible:
 - Genetic stock from native bosque species growing in warmer and drier areas.
 - Native plants that have the Middle Rio Grande bosque as its range but may not currently be present or present in low numbers here.
 - Native riparian and xeric riparian plants commonly considered in revegetation plans for the Middle Rio Grande bosque.
- A variety of planting methods should be utilized, including the following:
 - Pole plantings to propagate cottonwood and willow where appropriate based on groundwater monitoring and depth to the water table

- Tall pot plantings of native shrubs and flowering plants
- Seeding native grasses and forbs by hand broadcasting, hydroseeding, and seed drill
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- The RAP should include maintaining visibility and defensible space as well as Operations and Maintenance access within 150 feet of the Central Avenue bridge, i.e. no woody plantings unless they meet defensible space criteria.
- Assessments of planting areas will include wildlife and vegetation surveys to monitor conditions and suitability for replanting.
- The planting schedule will consider appropriate seasons to maximize plant survival and monsoon patterns to maximize the chance of plant success; supplemental watering will be utilized if necessary to aid in the plant establishment period, possibly through the support of a contract.
- Plant materials will be sourced using local nurseries and vendors.
- Treated areas will be monitored for the emergence of annual weeds (Kochia, Tumbleweed, etc.), and action will be taken to remove sprouts of these species before setting seed in summer.
- Replanting plans will take into account the schedule for treatment of resprouts of invasives and the subsequent phases of invasive plant removals, including follow-up treatment of Ravenna grass (*Triplidium ravenna*) and Tree of Heaven (*Ailanthus altissima*)
- Volunteers, conservation corps, city staff, and other partners will be engaged to participate in monitoring, planting, and maintenance activities.
- Bosque restoration activities are built into the OSD volunteer event schedule and offered to the public and interested organizations a variety of opportunities to participate.

Reference Appendix B for a plant list from the City of Albuquerque Bosque Management Plan: Central Avenue to Campbell Road by GeoSystems Analysis, Inc. This will be used as a starting place for plant species considerations and what is available at local nurseries.

Partners

Several partners are dedicated to the success of this project, including the following:

- New Mexico Forestry Division
- Middle Rio Grande Conservancy District
- Ciudad Soil and Water Conservation District (CIUDAD)
- City of Albuquerque BioPark
- New Mexico Interstate Stream Commission
- The Bird Alliance of Central NM
- Bosque Ecosystem Monitoring Program
- Ancestral Lands Conservation Corps

Additionally, the City will work with a Technical Advisory Committee to provide input on the RAP and be convened by the Bird Alliance of Central NM.

Funding Resources

Several funding resources are dedicated to this project for the short- and long-term Restoration Action Plans. In addition to what is listed below, CIUDAD will continue to support the project through grant opportunities. The city is also working with the New Mexico Interstate Stream Commission to reestablish previous restoration sites and swales in the area to further support the long-term RAP efforts. In addition, Ancestral Lands Conservation Corps is under contract with OSD to provide eight weeks of restoration project work in the Bosque, which may go to support the short-term RAP.

Short-term Restoration Action Plan

Description	Source	Funds	Notes
Rio Grande Bosque Wildfire Mitigation Plan	FEMA Grant	\$32,000	For plantings
Plant Material for Bosque Restoration	MRGCD	\$17,000	Native plants at Santa Ana Nursery
Groasis Waterboxxes	Whitfield Conservation Area	50 boxxes at \$36.00 each = \$1,800	Lending 50 boxes

Long-term Restoration Action Plan

Description	Source	Funds	Notes
Retreatment, further removal of Ravenna Grass and Ailanthus, native plant material	New Mexico Forestry Division	Up to \$350,000	Available through an MOU between the City and NMFD. (Workplan pending approval.)
Capital projects that may include project design and implementation along with equipment	City General Obligations Bonds	\$300,000 to \$700,000	Funding is to support the entire Rio Grande de Albuquerque

Short-term Restoration Action Plan

The Short-term RAP is intended to be actions that can be taken over the next six months, from February to August 2024, to limit disturbance further and start active restoration. The action items include the following:

- The OSD will prioritize closing off roads and social trails throughout the project area to limit the public from accessing these areas, deter illegal off-road vehicles, and prevent further soil disturbance.
- The OSD will work with partners to repurpose the mulch and wood piles. The OSD will use these woody materials for other Open Space projects and make the material available for partner projects, including community gardens and City parks. Material may also go to the City composting centers.
- The OSD will work with partners and Geosystems Analysis Inc. to conduct a thorough assessment and develop a detailed long-term RAP for each Unit. The long-term RAP will consider past projects and activities, groundwater depth, wildlife surveys, and other

available data to help inform the best location for different habitat types and determine where plants will grow best.

- The OSD will work with local nurseries to grow specific preferred plants, especially in tall pots and native seed mixes for meadow areas.
- The OSD will work with volunteers and partners to start active restoration in Unit 5.

Unit 5 Short-Term Restoration Action Plan

Unit 5 is 13.5 acres located southeast of Central near Tingley. This area is one of the most highly visited parts of the Rio Grande Valley State Park and, therefore, ideal for volunteer and partner support, especially with the Albuquerque BioPark. While short-term actions will be implemented at this site, the Unit will also be included in the long-term RAP.

This Unit is mainly comprised of large Cottonwood trees with an abundant native understory due to past restoration efforts. During the Rio Grande Bosque Wildfire Mitigation Project, exotic invasive species were removed, including large and small-diameter Siberian elm, Russian olive, and Tamarisk.

Ravenna grass, also a noxious weed, was not treated during the project. However, the New Mexico State Forestry Division will assist the OSD by targeting the grass in follow-up treatments. Youth crews and volunteers will also help with the hand removal of Ravenna grass. Large Ravenna grass stands remain along the NW corner of the Unit, and isolated clumps spread throughout the area.

The Wildfire Mitigation Project resulted in some moderate soil disturbance throughout the Unit. Patches of bare ground exist under large Cottonwood trees. These areas will be seeded with a native grass seed mix.

Clusters of native plants are present in the area, including stands of NM Olive, false indigo bush, Woods rose, coyote willow, and Golden currant. Care will be taken to avoid disturbance to these plants, and additional plantings will be established to enhance overall diversity and habitat richness.

The action items below will be incorporated in the Unit (reference Appendix C for a map of the area).

- **Location:** Main walkway on the north end of the Tingley parking area.
This area has been highly disturbed and typically has an abundance of annual weeds like Kochia. The area was used as a dumping site for construction materials prior to the area being designated as the Rio Grande Valley State Park. Previous restoration activities have not been successful due to poor soil quality and lack of water.

The OSD will spread mulch along the main walkway to a depth of 3 inches and plant native shrubs and cacti along the walkway using Groasis waterboxxes on loan from the Whitfield Conservation Area. The mulch will help with weed suppression and improve soil health. Additionally, the water boxes have been proven to have a high success rate in establishing plants and will reduce the need for hand watering.

- **Location:** existing swales and within 100 feet of the Rio Grande.
Volunteers will plant willow and cottonwood poles in areas with high groundwater depths. This will promote a new generation of cottonwoods and canopy trees.

- Location: throughout the Unit
The OSD will seed with a native seed mix and light mulching in areas of bare soil or disturbance from machinery.
- Location: throughout the Unit
Follow-up treatment of Ravenna Grass, tree of heaven, and resprouts of exotics, as well as monitoring and removing annual weeds like Kochia and tumbleweed.

Recommendations for the Long-term Plan

The Open Space Division will maintain, monitor, and revegetate the project area with native grasses, shrubs, and trees to further enhance wildlife habitat. Plants will be selected to restore a mosaic of habitat and vegetation types across the restoration units.

The long-term RAP should also take into consideration recommendations identified in the Middle Rio Grande Conservation Action Plan for Habitat Targets. This plan provides targets for riparian and wetland communities while taking an ecosystem approach. Per the 2019 version of the document and current working updates, targets for native versus non-native components as well as habitat types have been developed. These can serve as targets for riparian enhancement, treatment, and restoration projects.

For a key attribute of *percent cover of aggressive invasive herbaceous species*, a target score for *very good* equates to less than 1 percent cover of aggressive invasive herbaceous species, and *good* = less than 5 percent cover (Muldavin et al 2019). These include New Mexico Class A noxious weeds but also other species of concern such as kochia (*Kochia scoparius*), Russian thistle (*Salsola tragus*), camelthorn (*Alhagi maurorum*), giant cane (*Arundo donax*), perennial pepperweed (*Lepidium latifolium*), and Russian knapweed (*Acroptilon repens*).

For the key attribute of *percent exotic woody cover*, a *very good* rating is proposed at less than 10 percent of woody cover being non-native; *good* is at 10-25 percent.

The *dynamic patch mosaic (DPM) relative abundance of riparian vegetation type* key attribute is intended to evaluate the degree of complexity of the riparian vegetation patch mosaic as a measure of functional riparian and wetland ecosystems (Latterell et al. 2006; Muldavin et al. 2017). A patch mosaic of different vegetation types (riparian forest, shrubland, meadows, and marshes) suggests intact hydrological regimes with associated ecological processes. In contrast, riparian wetlands dominated by one community type likely reflect highly altered hydrological regimes or other impacts to ecosystem function and processes. The following DPM scores for a reach are proposed in the 2022 MRG-CAP update (Table 14) (Muldavin, Hummel, Draft 2022).

Table 1. Dynamic Patch Mosaic Scoring

Poor	Fair	Good	Very Good
DPM balance critically departed i.e., around 90% forest, 10% shrubland, 5% meadow, 0% marshes (excludes channel).	DPM balance significantly departed, i.e., around 75% forest, 15% shrubland, 5% meadow, 1% marshes.	DPM balance somewhat departed, i.e., around 50% forest, 25% shrubland, 10% meadow, 5% marshes	DPM well-balanced, i.e., around 35% forest, 35% shrubland, 20% meadow, 10% marshes (excludes channel)

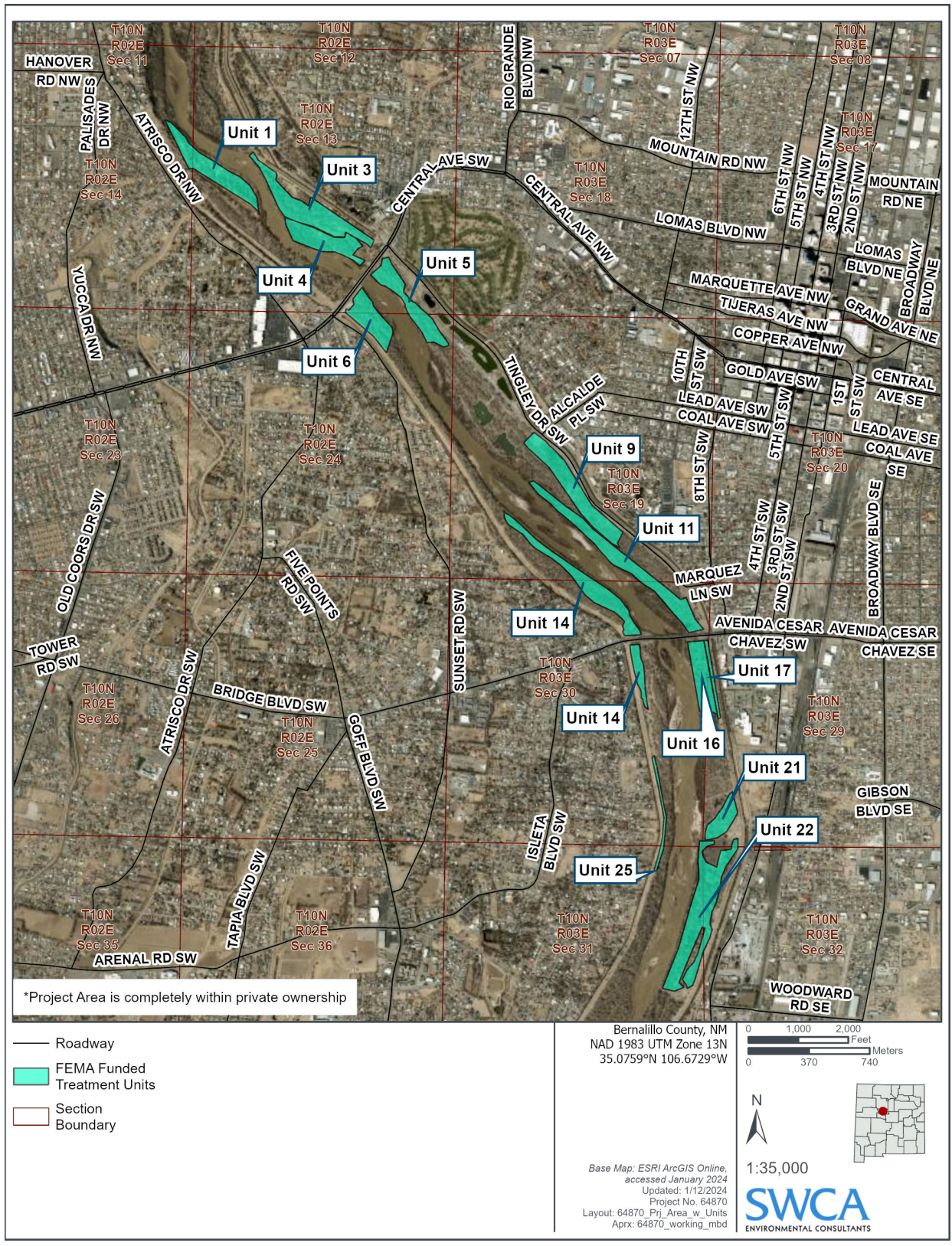
Additionally, there must be follow-up treatments with the invasive plants over the next couple of years to prevent them from vigorously resprouting. Weed mitigation needs to be addressed where soils are disturbed. Finally, strategically revegetating the area with native plants is essential for supporting habitat. This RAP is meant to begin the process of revegetation and ensure the long-term success of the Rio Grande Bosque Wildfire Mitigation Project.

The long-term RAP will consider past projects and activities, groundwater depth, wildlife surveys, and other available data to help inform the best location for different habitat types and determine where plants will grow best.

Major maintenance and management activities should be organized into regularly scheduled seasonal activities that can become part of the OSD's annual workflow and volunteer events.

The long-term RAP will result in diverse habitat types that will support numerous wildlife species that call the Bosque their home.

APPENDIX A



APPENDIX B

Plant list from the City of Albuquerque Bosque Management Plan:

Recommended Seed Mix

Indian ricegrass
Side oats grama
Blue grama
Rocky mountain bee plant
Annual sunflower
Bottlebrush squirreltail
Annual sunflower
Green sprangletop
Western wheatgrass
Galleta grass
Scarlet globemallow
Alkaline sacaton
Spike sacaton
Sand dropseed
Mesa dropseed
Giant dropseed
Asters

Riparian Shrub Species

New Mexico olive
Golden Currant
Silver buffaloberry
Woods rose
False indigobush

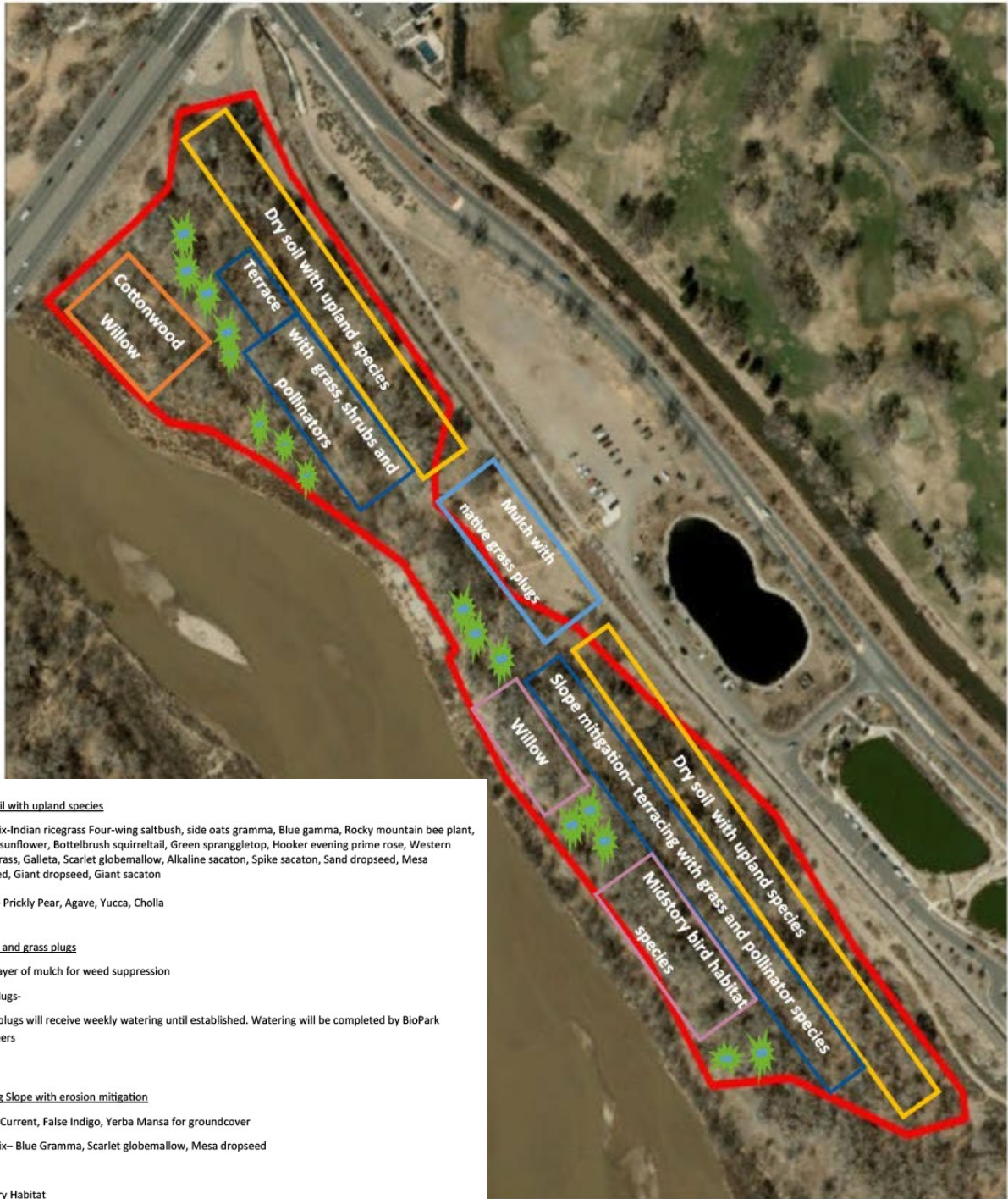
Xeric Shrub Species Mix

Seep willow/mule fat
Willow Baccharis
Threeleaf sumac
Apache plume
Pale or Torrey's wolfberry
Netleaf hackberry
Screwbean mesquite

APPENDIX C

OSD staff are currently working on the site map for Unit 5

Unit 5 Vegetation Outline



- Dry soil with upland species**
 Seed Mix-Indian ricegrass Four-wing saltbush, side oats gramma, Blue gamma, Rocky mountain bee plant, Annual sunflower, Bottlebrush squirreltail, Green sprangletop, Hooker evening prime rose, Western wheatgrass, Galleta, Scarlet globemallow, Alkaline sacaton, Spike sacaton, Sand dropseed, Mesa dropseed, Giant dropseed, Giant sacaton
 Cactus- Prickly Pear, Agave, Yucca, Cholla

- Mulch and grass plugs**
 3 inch layer of mulch for weed suppression
 Grass plugs-
 *Grass plugs will receive weekly watering until established. Watering will be completed by BioPark Volunteers

- Existing Slope with erosion mitigation**
 Golden Current, False Indigo, Yerba Mansa for groundcover
 Seed Mix- Blue Gramma, Scarlet globemallow, Mesa dropseed

- Midstory Habitat**
 Willow Baccaras, Seep Willow, False Indigo

- Riparian Habitat**
 Pole planting native Cottonwood and Willow