



Candelaria Farm Preserve Proposed Draft Site Plans

SWCA Environmental Consultants and
Dekker, Perich, Sabatini Architects
V. 1, April 11, 2019



Prepared for
City of Albuquerque Parks and Recreation, Open Space Division,
and The Candelaria Farm Preserve Technical Advisory Group

Primary Land and Water Conservation Fund Compliance Issues Addressed by this Proposed Site Plan:

1. Public access is restricted except for scheduled group.
2. For profit commercial farming is not defined.

Key Background Information Sources

Literature: *Historic Environments / Species, Current Environments/Species; What Was There / What Could Be There*

Watson, J.R. 1912. Plant geography of north central New Mexico. *Botanical Gazette* 54(3):194-217.

Hink, V.C., and R.D. Ohmart. 1984. Middle Rio Grande Biological Survey. U.S. Army Engineer Corps of Engineers, Albuquerque District, Albuquerque, New Mexico. Contract No. DACW47-81-C-0015. Tempe: Arizona State University.

Crawford, C.S., A.C. Cully, R. Leutheuser, M. S. Sifuentes, L. H. White, and J. P. Wilber. 1993. Middle Rio Grande Ecosystem: Bosque Biological Management Plan. Albuquerque: Biological Interagency Team, U.S. Fish and Wildlife Service.

Dick-Peddie, W.A. 1993. *New Mexico Vegetation—Past, Present and Future*. University of New Mexico Press.

Scurlock, Dan. 1998. *From the Rio to the Sierra: An Environmental History of the Middle Rio Grande Basin*. General Technical Report RMRS-GTR-5. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

SWCA Environmental Consultants. 2008. *Pueblo of Sandia Habitat Restoration Analysis and Recommendations, Middle Rio Grande Endangered Species Collaborative Program, Bernalillo County, New Mexico*. Prepared for the U.S. Bureau of Reclamation and Pueblo of Sandia. Albuquerque: SWCA Environmental Consultants.

Cartron, J.E., D.C. Lightfoot, J.E. Mygatt, S.L. Brantley and T.K. Lowrey. 2008. *A Field Guide to the Plants and Animals of the Middle Rio Grande Bosque*. Albuquerque: University of New Mexico Press.

GeoSystems Analysis, Inc. 2016. *City of Albuquerque Bosque Management Plan: Central Avenue to Campbell Road*. Prepared for City of Albuquerque, Open Space Division, Albuquerque, New Mexico.

Key Background Information Sources

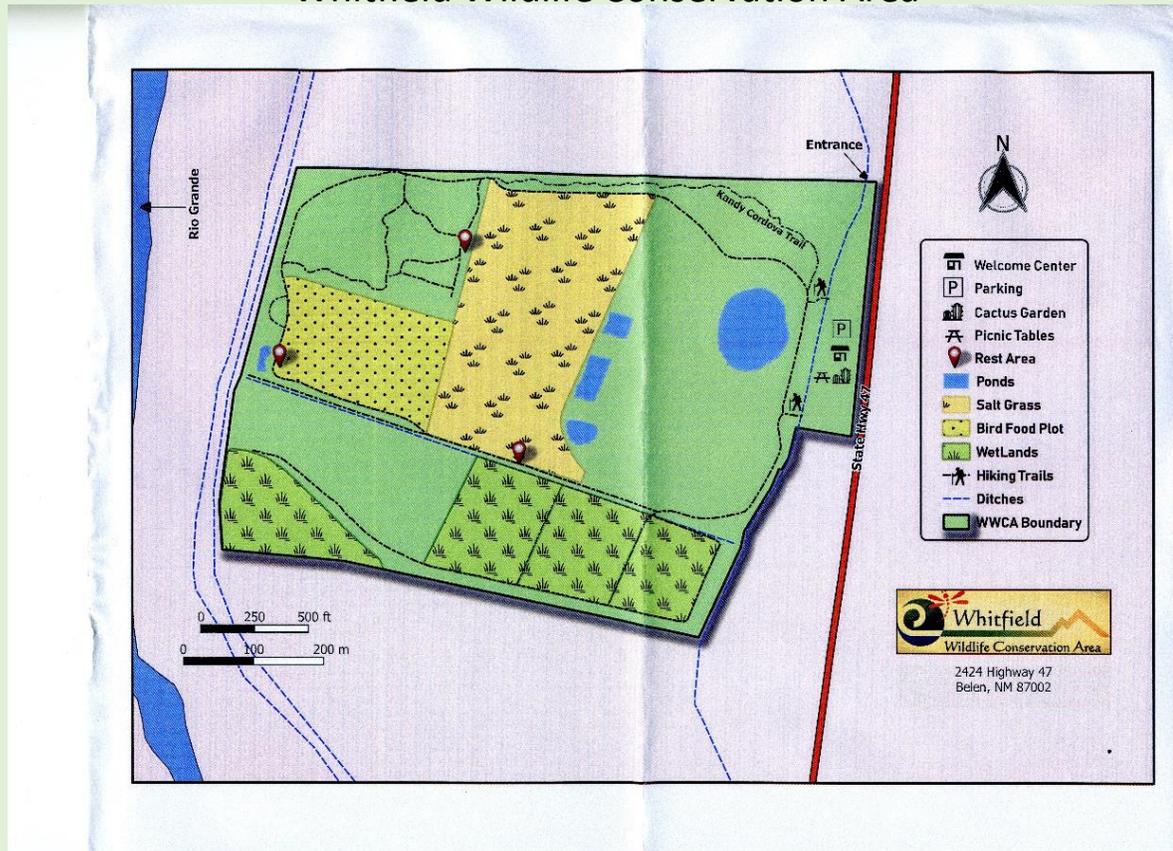
Other Regional Wildlife Preserves and Refuges; *Similar Wildlife Preserve Plans/Implementation in Similar Environments with Similar Management Goals.*

- Whitfield Wildlife Conservation Area, Valencia County.
- Bosque del Apache National Wildlife Refuge, Socorro County.
- Ladd S. Gordon Waterfowl Complex, Waterfowl Management Area, Socorro County.
- Valle de Oro National Wildlife Refuge, Bernalillo County



Valle de Oro National Wildlife Refuge

Whitfield Wildlife Conservation Area



Key Background Information Sources

The Candelaria Farm Preserve, Technical Advisory Committee

- Candelaria Farms Preserve Technical Advisory Group, Land-Use Planning Workshop, Michael Jensen, October 4-5, 2017.
- Plant Restoration at the Rio Grande Nature Center State Park, November 2015 to January 2018. Brian Hanson, March 16, 2018.
- Candelaria Farm Preserve Alternatives Land Use Workshop, June 19, 2018.
- Wildlife Habitat Recommendations for Candelaria Nature Preserve, Brian Hanson, Chairman, Technical Advisory Team, March 26, 2019.

Candelaria Farms Wetland Review

10/05/2017

Management Options for farm fields:

- 1) Flood irrigation farming- primarily harvested
- 2) Flood irrigation farming- primarily for wildlife; hot food
- 3) Flood irrigation for wildlife habitat- spring pulse for riparian, neotrops, shrubs
- 4) Flood irrigation for wildlife habitat: late June for amphibian
- 5) Flood irrigation for wildlife habitat: fall
- 6) Flood irrigation for wildlife habitat: winter
- 7) Flood irrigation for wildlife habitat: flashy monsoon
- 8) Rotational management of fields: crop
- 9) Rotational management of fields: habitat
- 10) Size and intersperson of treatments; maximizing wildlife value
- 11) Wider and multi-structural hedgerows
- 12) Viewing and access issues: high quality wildlife viewing vs rotational management , seasonal concerns
- 13) Shrubs along fence lines, fencing needs v wildlife barriers
- 14) Convert farmlands to upland veg
- 15) Modify surface topography
- 16) permanent wetland
- 17) salt grass management
- 18) plant nursery
- 19) upland connectivity with ponds
- 20) storm water sources?

Management Options for ponds

- 1) enhance water variability
- 2) drainage of ponds

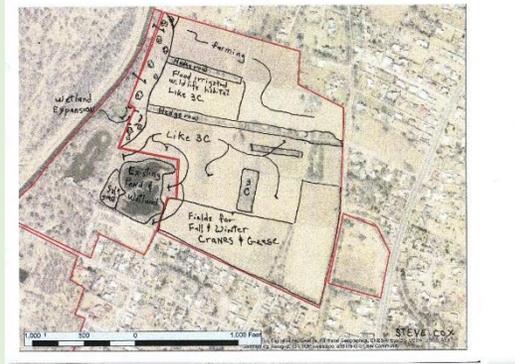
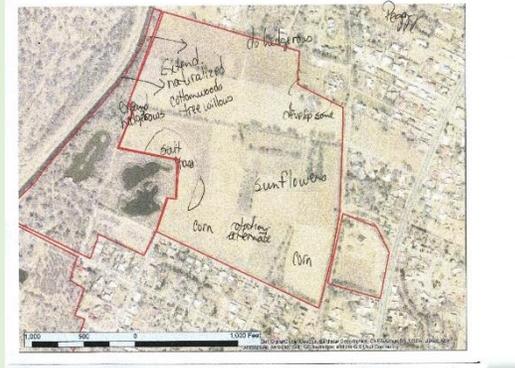
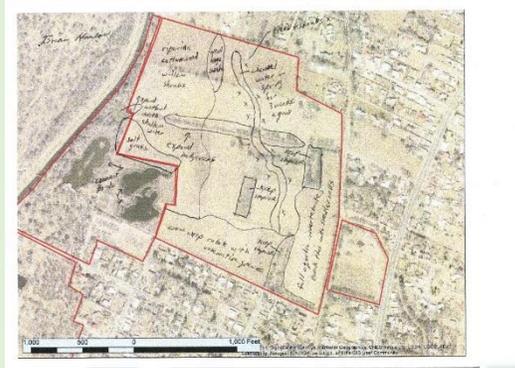
Other

- 1) Woodward House
- 2) Equipment storage
- 3) Signage, informational, history of traditional ag, etc.
- 4) Educational interface
- 5) Research opportunities

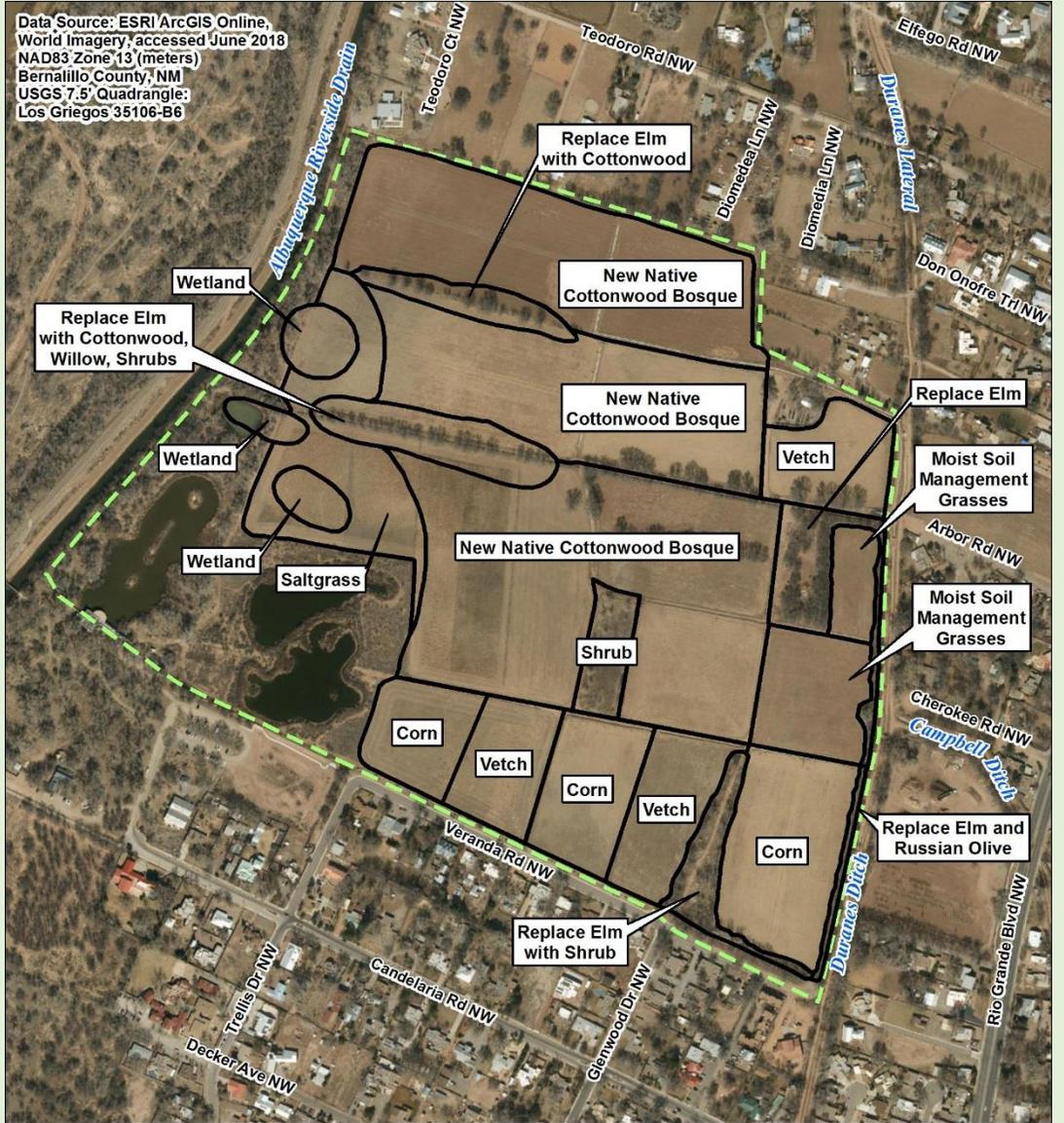
Potential Management Strategy	Predicted Abiotic Response	Predicted Biotic Response	Monitoring Actions to Consider	Obstacles to Implementation
Flood Irrigation Farming- primarily harvested (benefit of farmer)	<ul style="list-style-type: none"> - Soils degraded - Natural seed bank may be reduced - Potentially increased water use (depending on crop) - Increased herbicide - Increase fertilization - Increase need for nitrogen fixing plants/opportunities - Reduced wildlife educational/interpretive opportunities 	<ul style="list-style-type: none"> - monotypic agriculture - reduced wildlife diversity - overall reduce biodiversity + less invasive exotic overall + cranes and geese use in winter - effect of wildlife on farm product 	<ol style="list-style-type: none"> 1. Staff monitoring contract compliance (cropping plans, financial reporting, pesticide use) 2. Water monitoring during active irrigation 	<ul style="list-style-type: none"> - political issues - against LWCF recommendations - against city council resolution - inconsistent with existing laws, regulations and policies - not supported by neighborhood - lack of staff - public trust of staff
Flood Irrigation for Wildlife Habitat- spring pulse for riparian neotrops and shrubs	<ul style="list-style-type: none"> - Increased water on the site - More mechanical management - Expanding management beyond the spring pulse 	<ul style="list-style-type: none"> + Increased waterfowl use + Increased invertebrates + Increased shorebirds + Degradation of plant materials (flood), germination (drawdown) 	<ol style="list-style-type: none"> 1. Have to monitor water application 2. Wildlife response monitoring 3. Vegetation monitoring 4. Invasive species monitoring 	<ul style="list-style-type: none"> - Unknown seed bank - Will take active restoration - requires design and dirt moving - timing considerations
Wider and multi-structural hedgerows	<ul style="list-style-type: none"> - reduction of wind erosion - smaller fields for active management - create shade and microclimates - modifies the viewshed 	<ul style="list-style-type: none"> + Increased wildlife diversity (insects, mammals, birds, etc) + Increased plant diversity - could be a biological sink - impact of shade on field growth - increased geese nesting 	<ol style="list-style-type: none"> 1. Water management monitoring (and plan) 2. Non-desirable species monitoring (geese, cow birds, invasive plants) 3. Wildlife response monitoring 4. Vegetation monitoring 	<ul style="list-style-type: none"> - water delivery infrastructure
Permanent Wetland	<ul style="list-style-type: none"> - liner/compaction effects - mechanical excavation/cleaning/disturbance - needed inoculation of wetland soil - mosquito control 	<ul style="list-style-type: none"> + Increased invertebrates +obligate wetland wildlife (common yellowthroats, yellow-breasted chats) - mosquitoes + Increased bat diversity + rookery/roosting opportunities + increased herpetofauna - bull frogs - red-eared sliders 	<ol style="list-style-type: none"> 1. Water monitoring 2. Vegetation monitoring 3. Wildlife 4. Water quality 	<ul style="list-style-type: none"> - water delivery - water retention, soil structure - not naturally occurring - water rights/availability - maintenance

The Candelaria Farm Preserve, Technical Advisory Group

Example TAG preliminary draft site plans



Final comprehensive TAG draft site plan



Project Area



- Crop Area
- Candelaria Farm Preserve

Project No. 49448
File: 49448_Prl_Area
Map Created: 6/22/2018
Map Updated: 6/25/2018



New Mexico

Tools for Planning

Potential Plant Species for Habitat Restoration or Crops (*only top portion of spreadsheet shown here*)

Wildlife Habitat / Potential Plant Species Matrix					
	Grass, Forb, Shrub, Tree	Historic or current native			
Habitat Type	Growth Form	Species	Latin Name	Environment/Irrigation	Wildlife Value
Saltgrass Grassland	Grass	Saltgrass	Distichlis spicata	wet-dry sandy clay soils, light summer irrigation	grassland habitat, granivores, grazers
	Grass	alkali sacaton	Sporobolus airoides		
	Grass	giant sacaton	Sporobolus wrightii		
	Grass	blue grama			
	Grass	little blue-stem			
	Grass	Galleta			
	Grass	sand dropseed			
	Grass	bearded sprangletop			
	Forb	yerba mansa			
Blue Grama Grassland	Grass	blue grama		dry sandy clay soils, light summer irrigation	
	Grass	sand dropseed			
	Grass	Galleta			
	Grass	Indian ricegrass			
	Grass	silver bluestem			
	Grass	side-oats grama			
	Shrub	broom dalea			
	Shrub	Biglove's rabbitbrush			
	Succulent	Plains yucca			
	Succulent	Plains prickly pear			
Grass	burro grass				
Arroyo Edge Shrubland	Shrub	Four-wing saltbush		wet-dry sandy clay soils, light summer irrigation, spot watering	edge habitat, pollinators, granivores, browsers
	Grass	giant sacaton			
	Shrub	Apache plume			
	Shrub	seep willow			
	Tree	net-leaf hackberry			
	Shrub	golden current			
	Shrub	Wolf-berry			
	Shrub	New Mexico olive			
	Shrub	little-leaf sumac			
	Shrub	three-leaf sumac			
Tree	black locust				
Hedgerows (road/trail borders)	Shrub	Wolf-berry		dry sandy clay soils, no irrigation/spot watering	edge edge habitat, pollinators, frugivores, granivores, browsers
	Shrub	New Mexico olive			
	Tree	net-leaf hackberry			
	Shrub	Apache plume			
	Tree	screw-bean mesquite			
	shrub	seep willow			
	Shrub	golden current			
	Shrub	Wolf-berry			
	Tree	Rio Grande cottonwood			
	Shrub	little-leaf sumac			
Shrub	three-leaf sumac				
Tree	black locust				

Proposed Sequential Writing Plan for the Candelaria Preserve Resource Management Plan

