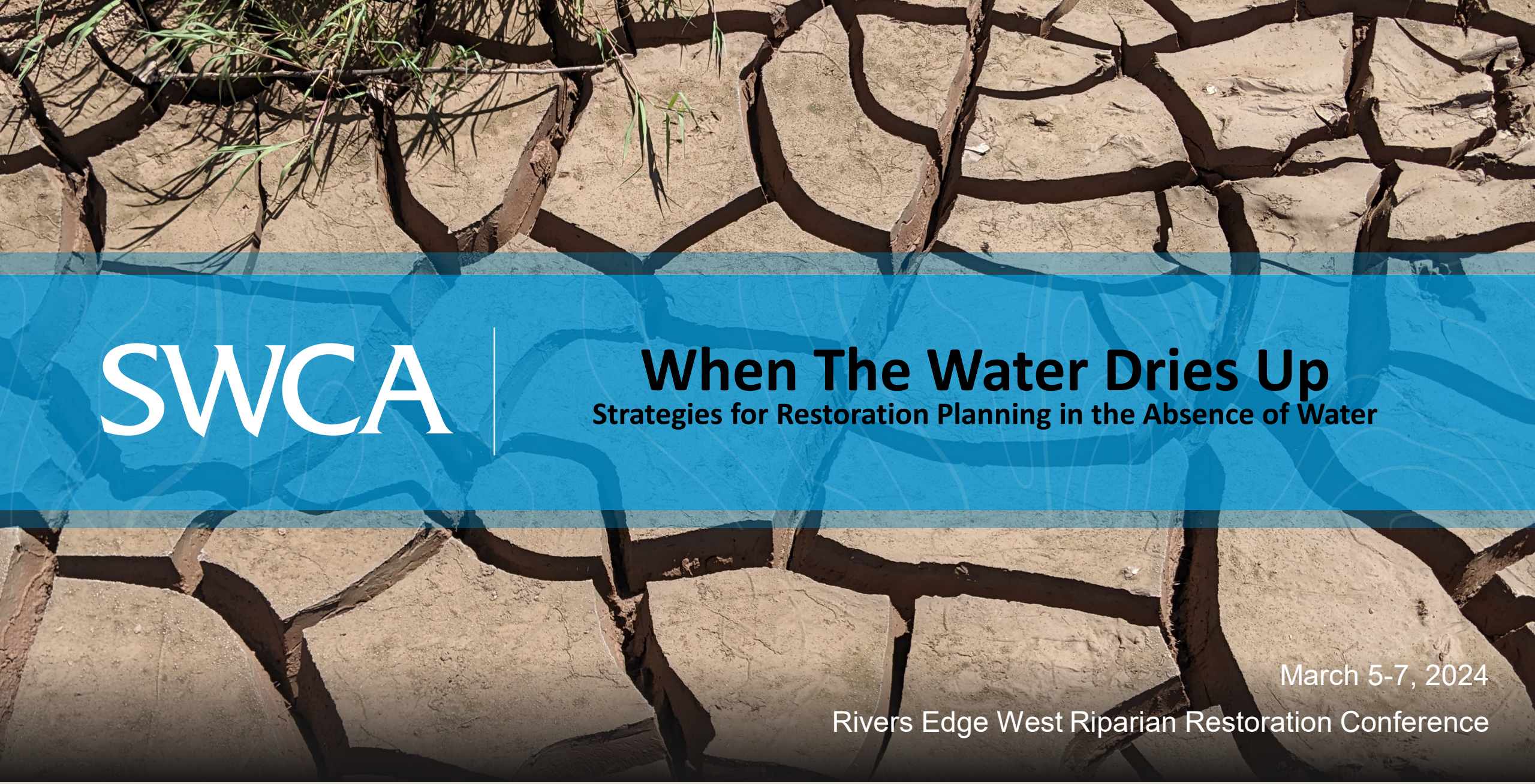

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When The Water Dries Up

Strategies for Restoration Planning in the Absence of Water

March 5-7, 2024

Rivers Edge West Riparian Restoration Conference

Sound Science. Creative Solutions.®

Presenter Information

PRESENTER

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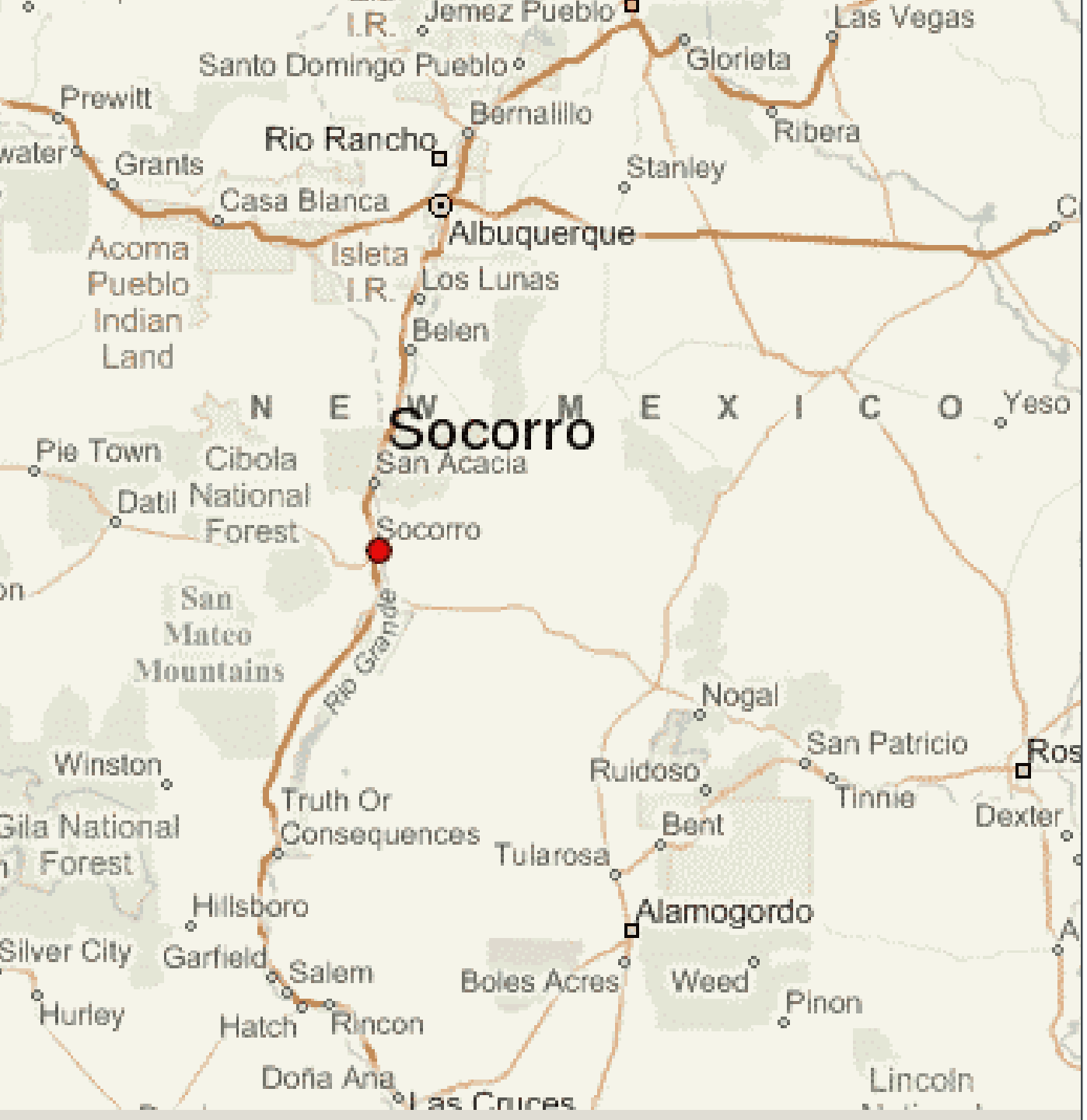
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I.R.
Las Vegas
Santo Domingo Pueblo
Glorieta
Prewitt
Bernalillo
Rio Rancho
Ribera
Grants
Stanley
Casa Blanca
Albuquerque
Acoma
Pueblo
Indian
Land
Isleta
I.R.
Los Lunas
Belen
N E W M E X I C O
Yeso
Socorro
Pie Town
Cibola
National
Forest
San Acacia
Datil
Socorro
San
Mateo
Mountains
Rio Grande
Nogal
San Patricio
Winston
Ruidoso
Tinnie
Truth Or
Consequences
Bent
Tularosa
Gila National
Forest
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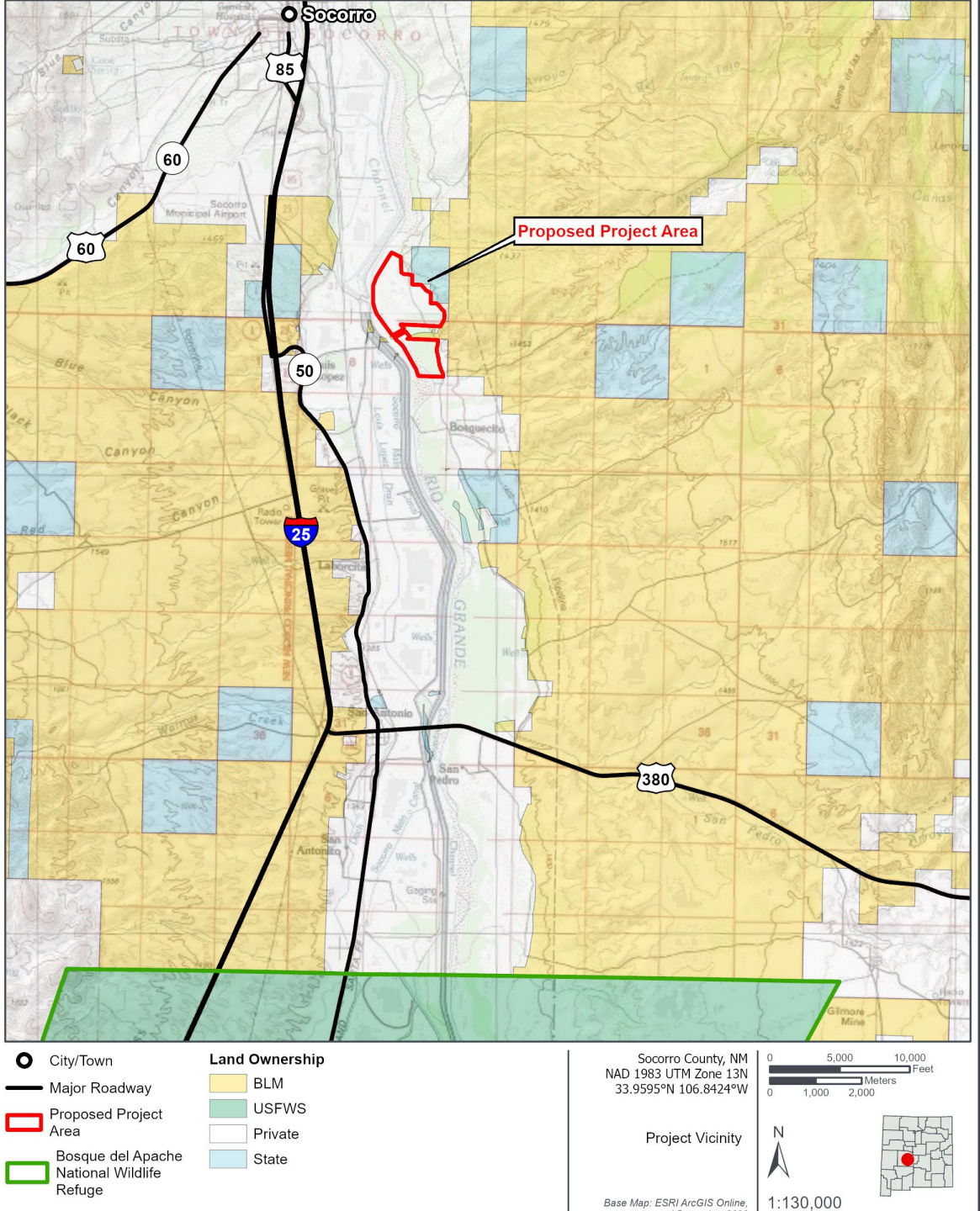
Hatch
Rincon
Doña Ana
Lincoln


Socorro
85
60
60
Proposed Project Area
50
25
380
City/Town
Major Roadway
Proposed Project Area
Bosque del Apache National Wildlife Refuge
Land Ownership
BLM
USFWS
Private
State
Socorro County, NM
NAD 1983 UTM Zone 13N
33.9595°N 106.8424°W
0 5,000 10,000 Feet
0 1,000 2,000 Meters
Project Vicinity
N
1:130,000
Base Map: ESRI ArcGIS Online,

“…to restore the native plant communities while maximizing the habitat benefit for wetland-dependent wildlife…”

1. Increase native riparian vegetation
2. Reduce encroachment of invasive plants
3. Restore uplands to native plant communities

Restoration Planning Strategies

Establish Goals and Objectives

SWCA

Identify Opportunities & Constraints

Dig into Existing Data

SWCA

Collect Field Data

SWCA

Run Models

SWCA

Dream Palette

Consider Phased Approach

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Qualified Contractors

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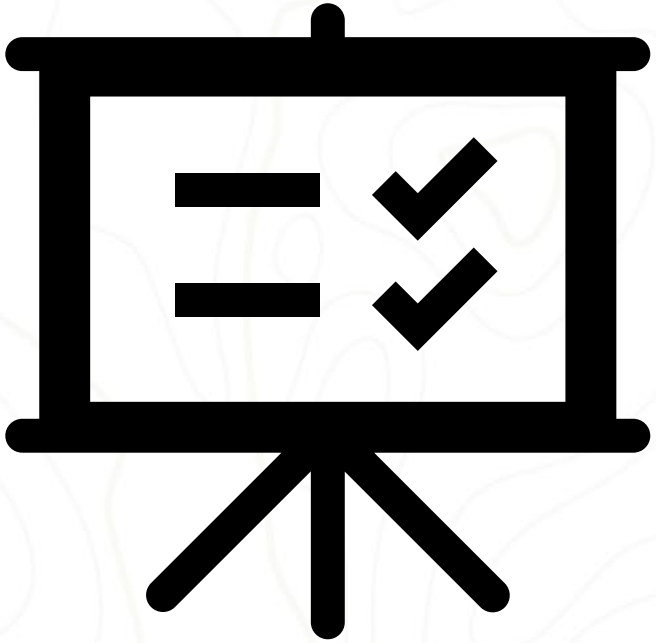
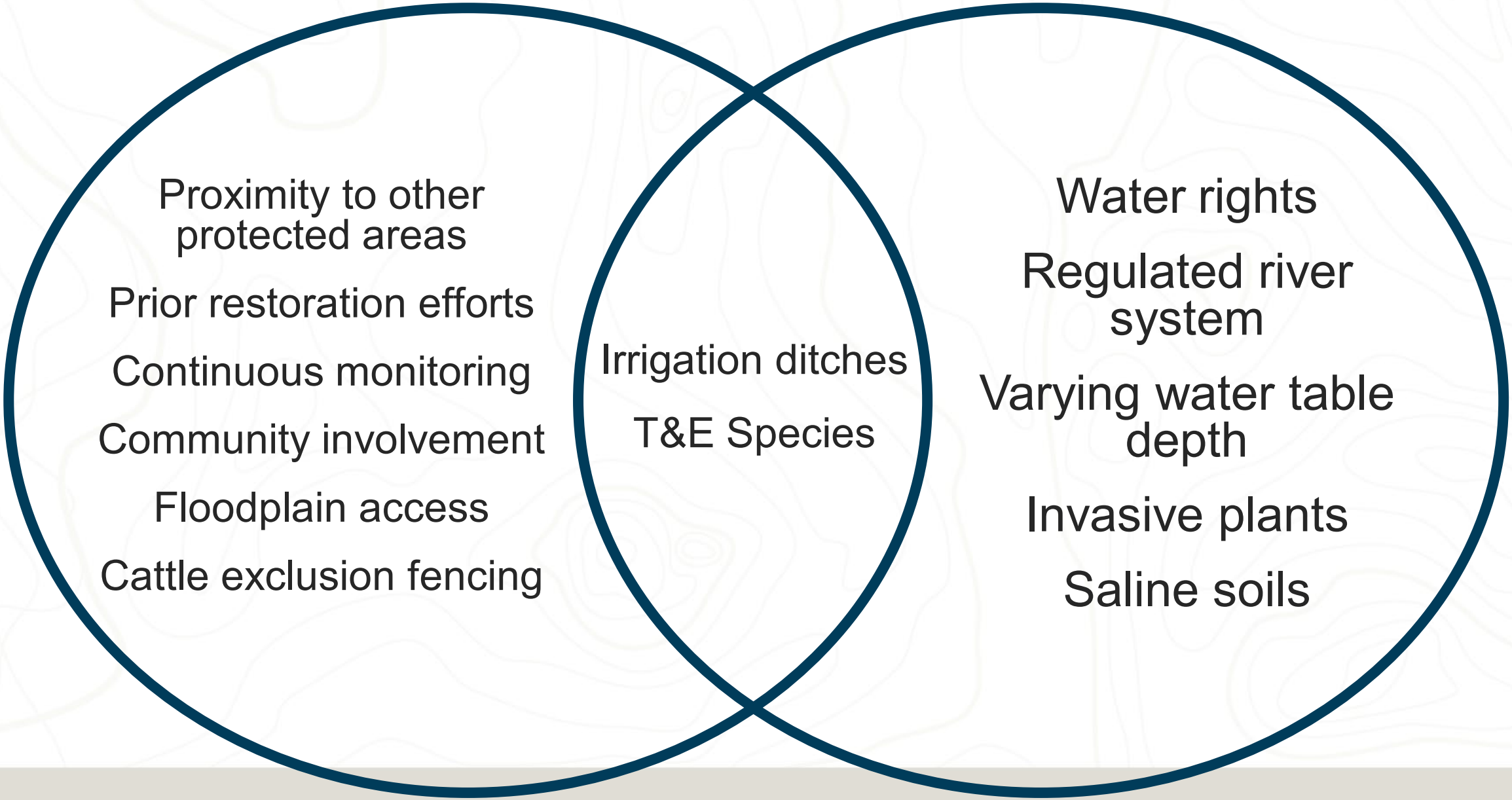
Monitor

Establish Goals and Objectives

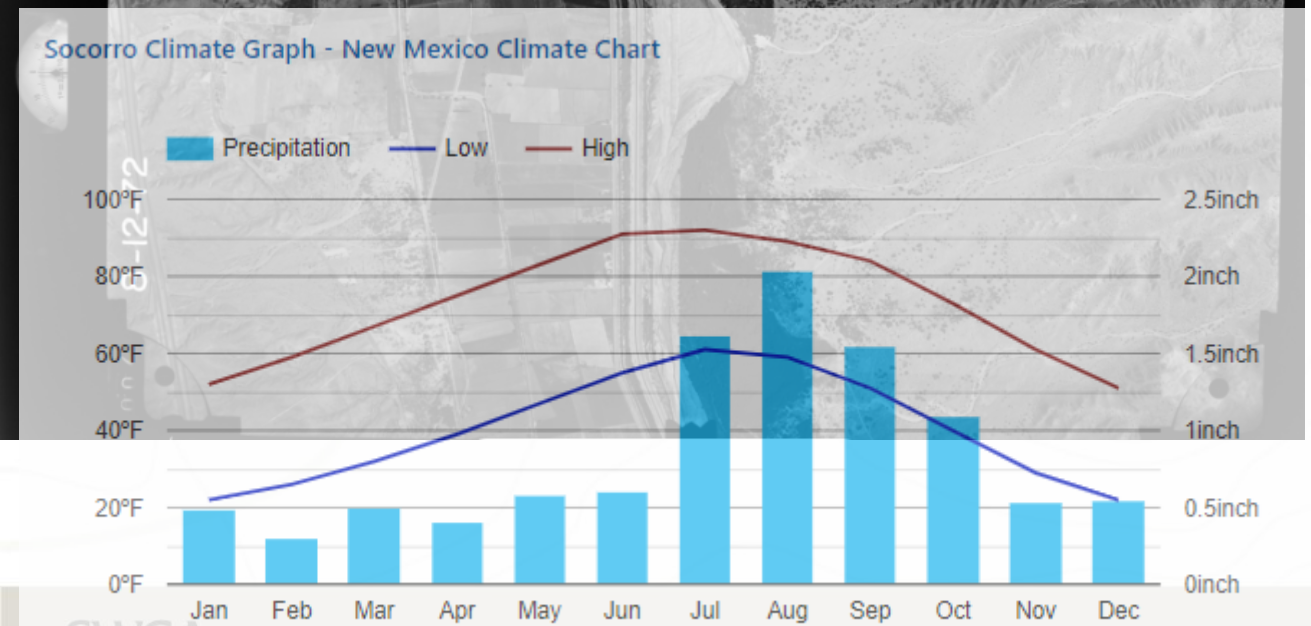


Identify Opportunities & Constraints

Identify Opportunities & Constraints



Dig into Existing Data



USGS 08355050 RIO GRANDE AT BRIDGE NEAR ESCONDIDA, N

Available d

Stream Site

DESCRIPTION:

Latitude 34°07'15", Longitude 106°53'13" NAD83
Socorro County, New Mexico, Hydrologic Unit 13020203
Drainage area: 28,068 square miles
Contributing drainage area: 23,872 square miles,
Datum of gage: 4,619 feet above NAVD88.

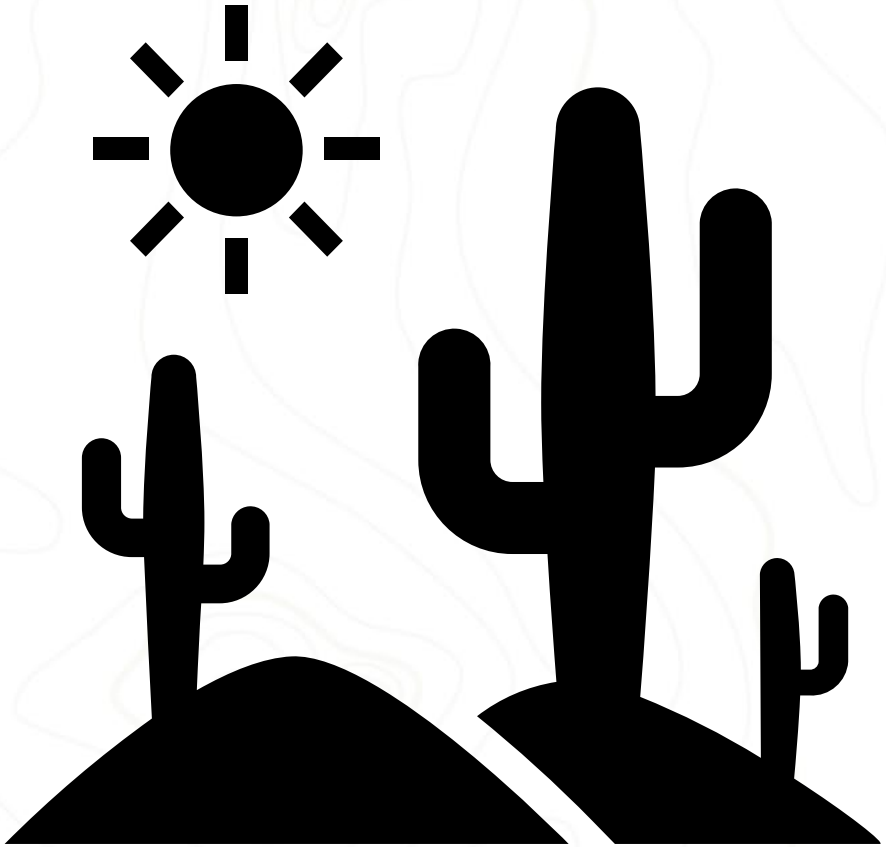
AVAILABLE DATA:

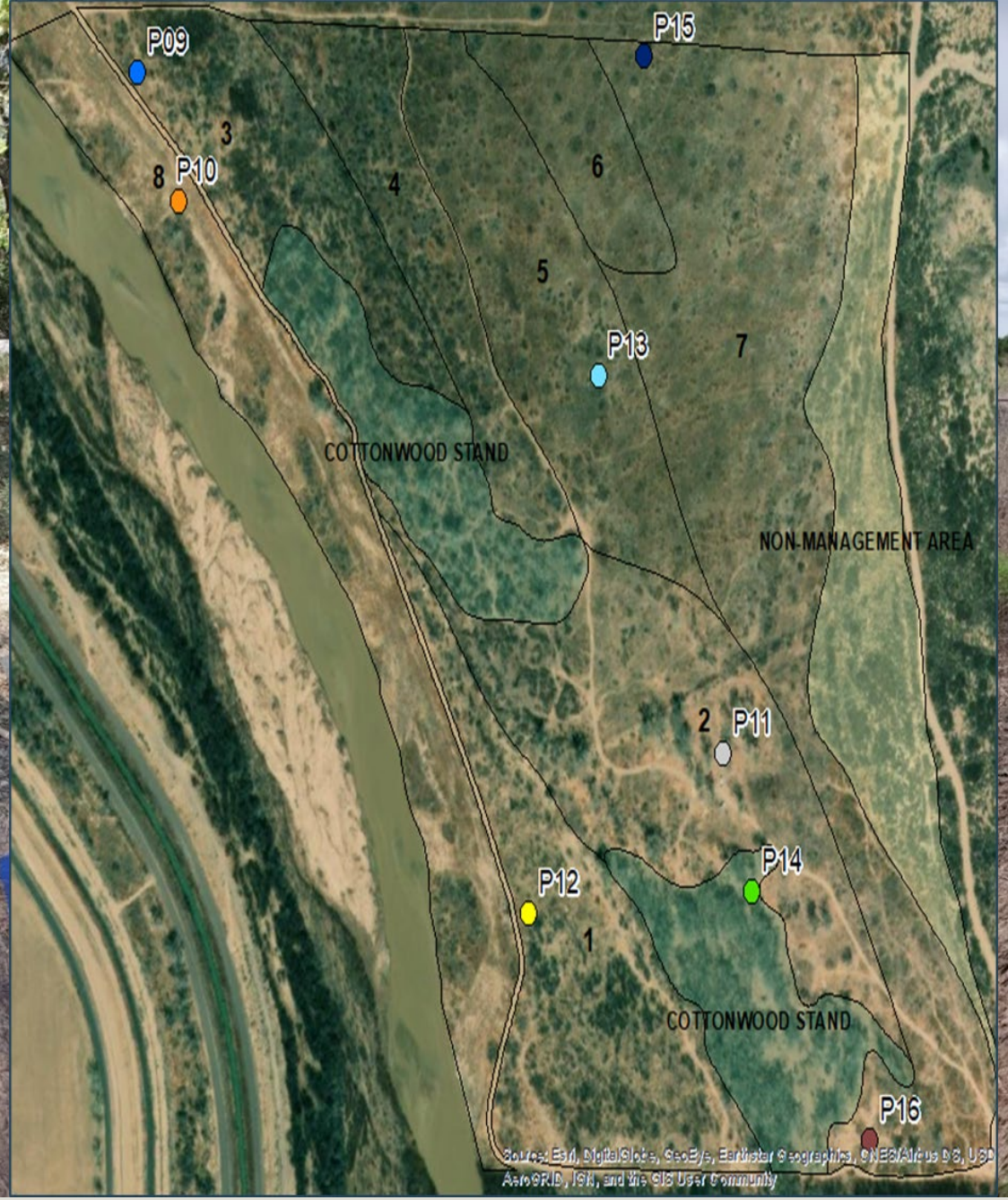
Data Type	Begin Date	End Date	Co
Current / Historical Observations (availability statement)	2005-10-01	2024-02-23	
Daily Data			
Discharge, cubic feet per second	2005-09-30	2024-02-22	66
Daily Statistics			
Discharge, cubic feet per second	2005-09-30	2021-02-01	56
Monthly Statistics			
Discharge, cubic feet per second	2005-09	2021-02	
Annual Statistics			
Discharge, cubic feet per second	2005	2021	
Peak streamflow	2006-08-01	2019-12-01	
Field measurements	2005-06-23	2024-02-01	2
Field/Lab water-quality samples	2005-07-14	2011-03-28	
Water-Year Summary	2006	2020	
Revisions	Available (site:0) (timeseries:		

OPERATION:

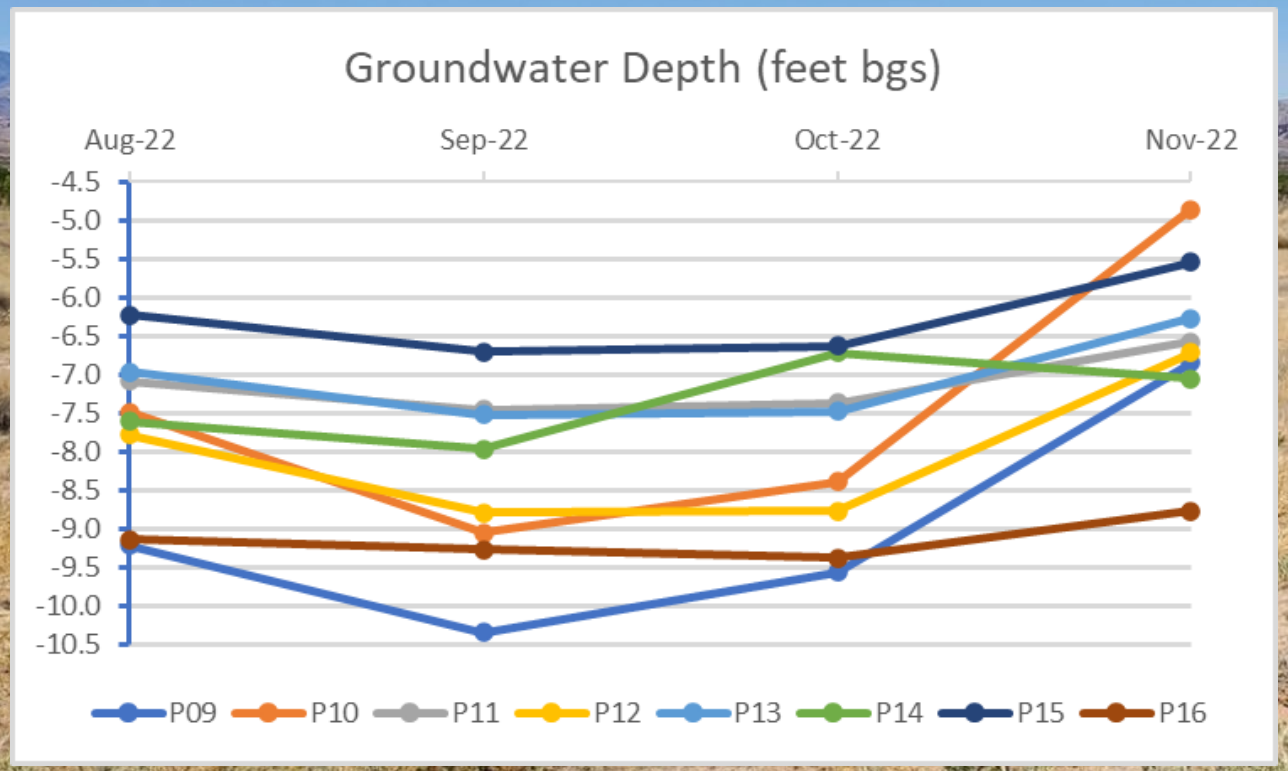
Record for this site is maintained by the USGS New Mexico Water Science Center
Email questions about this site to New Mexico Water Science Center Water-Data Inquiri

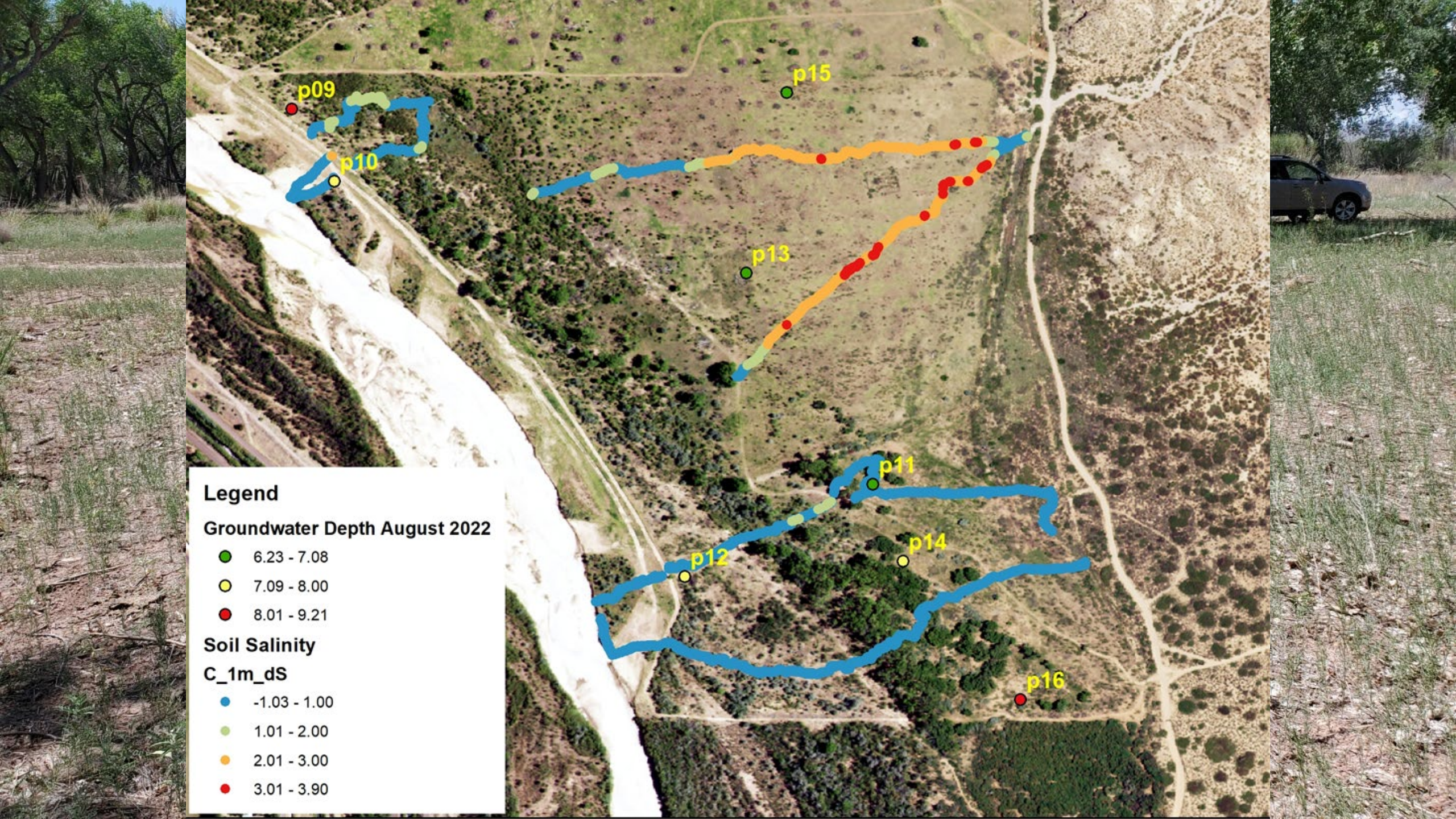
Collect Field Data




P09
P15
3
8
P10
4
6
5
P13
7
COTTONWOOD STAND
NON-MANAGEMENT AREA
2
P11
P14
P12
1
COTTONWOOD STAND
P16
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, AeroGRID, IGN, and the GIS User Community

GROUNDWATER WELL DATA

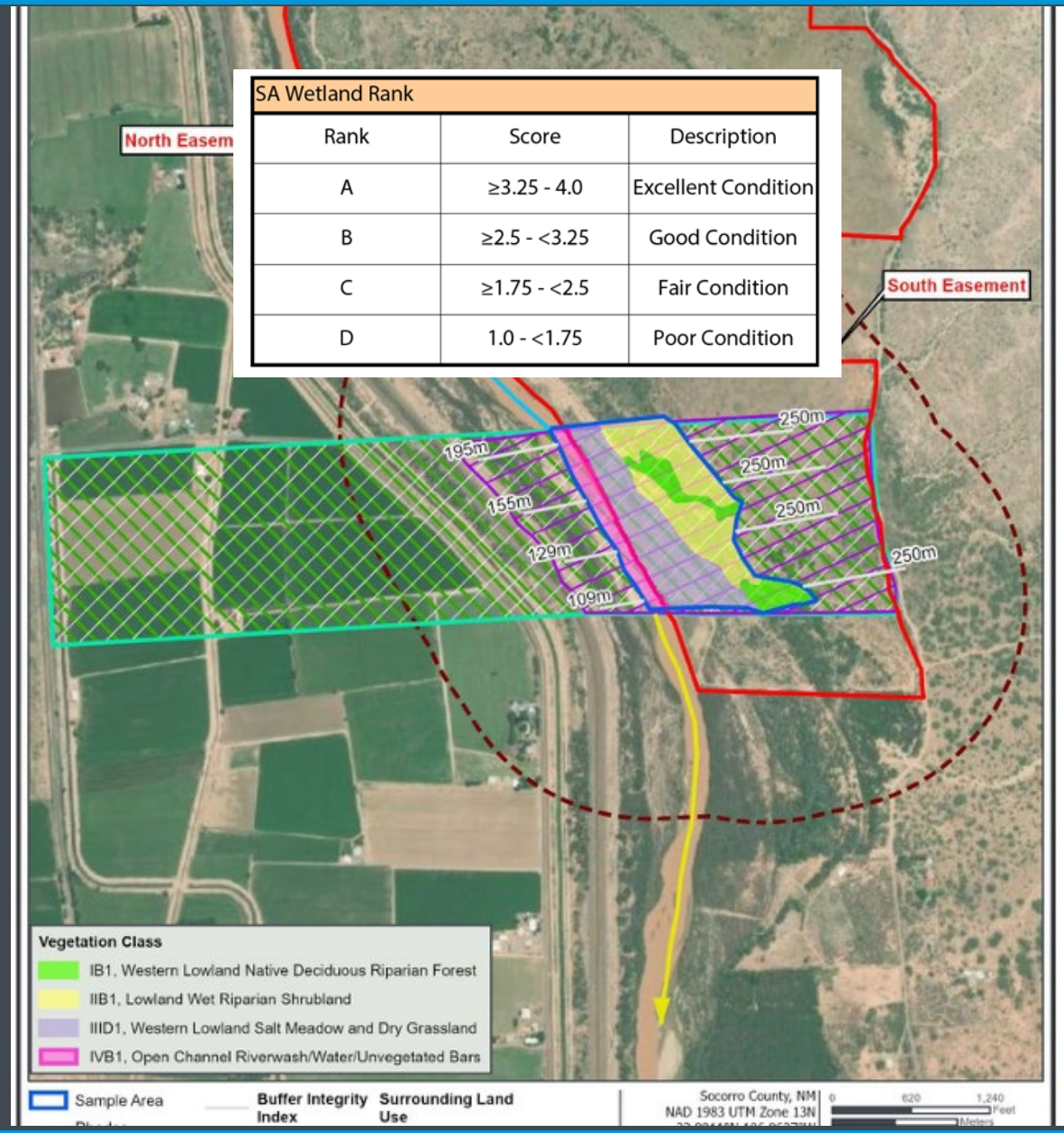



p09
p10
p15
p13
p11
p12
p14
p16
Legend
Groundwater Depth August 2022
6.23 - 7.08
7.09 - 8.00
8.01 - 9.21
Soil Salinity
C_1m_dS
-1.03 - 1.00
1.01 - 2.00
2.01 - 3.00
3.01 - 3.90

NEW MEXICO RAPID ASSESSMENT METHOD

Table 3-1. Rhodes Easement SA Baseline NMRAM Scores

Metric Description	Rating	Weight	Final Score
Landscape Context Attribute			**3**
L1. Buffer Integrity Index	4	0.25	1
L2. Riparian Corridor Connectivity	4	0.25	1
L3. Relative Wetland Size	2	0.25	0.5
L4. Surrounding Land Use	2	0.25	0.5
Biotic Attribute			**1.8**
B1. Relative Native Plant Community Composition	2	0.2	0.4
B2. Vegetation Horizontal Patch Structure	3	0.2	0.6
B3. Vegetation Vertical Structure	1	0.2	0.2
B4. Native Riparian Tree Regeneration	2	0.2	0.4
B5. Invasive Exotic Plant Species Cover	1	0.2	0.2
Abiotic Attribute			**2.6**
A1. Floodplain Hydrologic Complexity	1	0.2	0.2
A2. Physical Patch Complexity	2	0.2	0.4
A5. Soil Surface Condition	3	0.2	0.6
A6. Channel Mobility	3	0.2	0.6
A11. Groundwater Index	4	0.2	0.8
SA Conditions Scoring Summary			
Major Attribute	Score	Weight	Weighted Score
Landscape Context	3	0.3	0.9
Biotic	1.8	0.35	0.63
Abiotic	2.6	0.35	0.91
SA Wetland Condition Score			2.44
SA Wetland Rank			C



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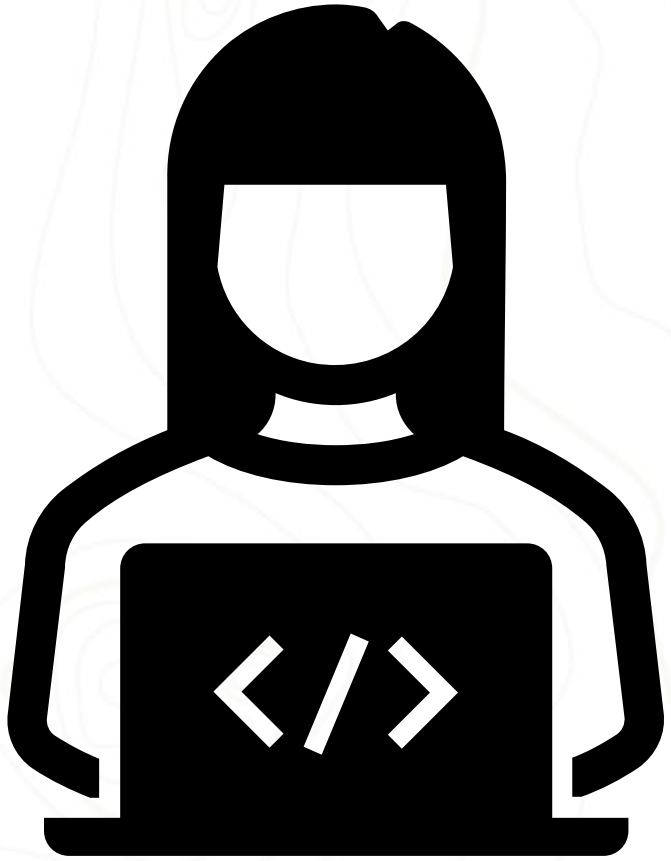
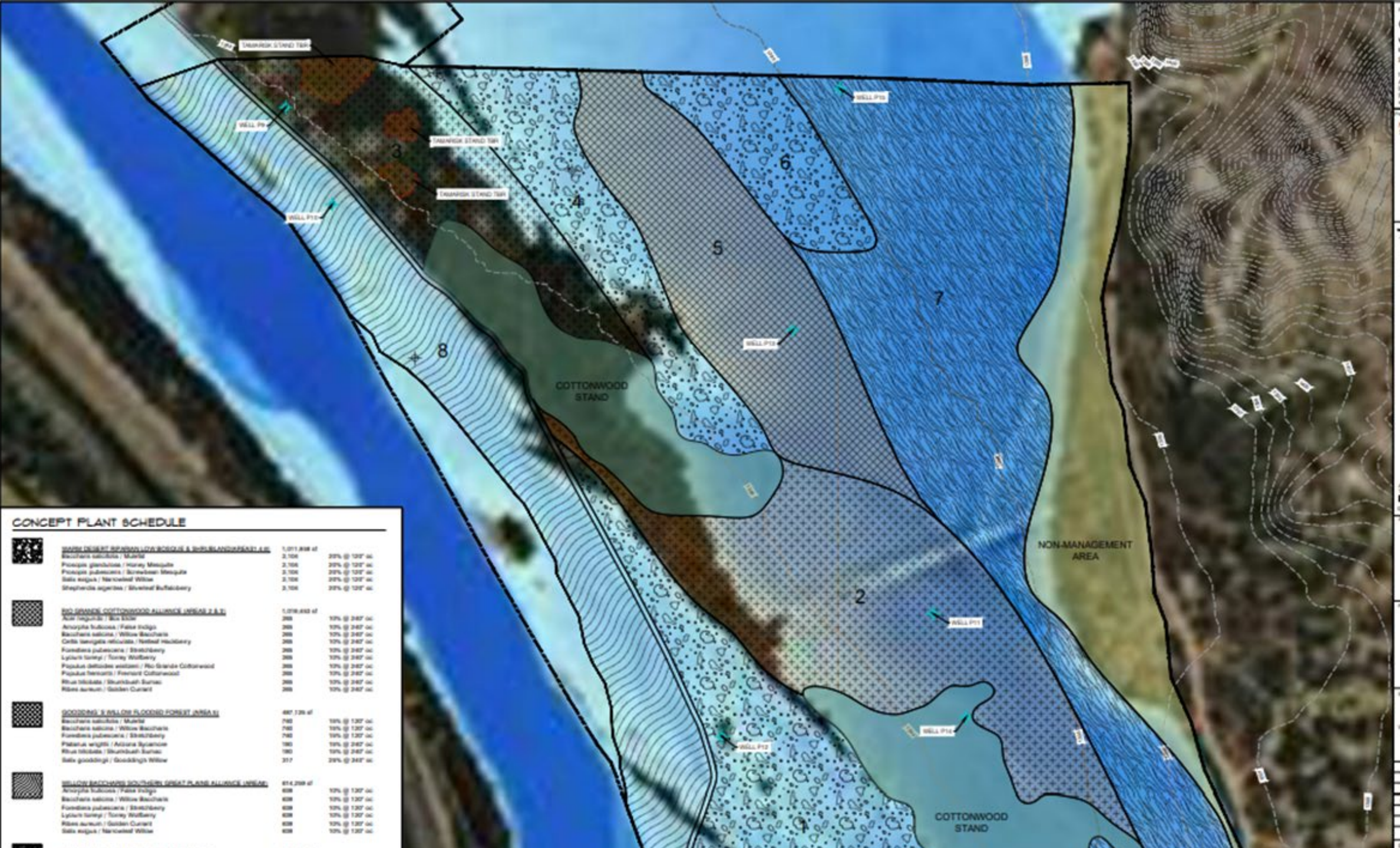
Run Models





CONCEPT PLANT SCHEDULE

	WARM DESERT RIPARIAN LOW BOSQUE & SHRUBLAND/GRASS (-0.5')	1,011,838 sf	
	Baccharis salicifolia / Mulefat	2,104	20% @ 120" oc
	Prosopis glandulosa / Honey Mesquite	2,104	20% @ 120" oc
	Prosopis pubescens / Screwbean Mesquite	2,104	20% @ 120" oc
	Salix exigua / Narrowleaf Willow	2,104	20% @ 120" oc
	Shepherdia argentea / Silverleaf Buffaloberry	2,104	20% @ 120" oc
	RIO GRANDE COTTONWOOD ALLIANCE (WEG# 2 & 3)	1,018,493 sf	
	Acer negundo / Box Elder	269	10% @ 240" oc
	Amorpha fruticosa / False Indigo	269	10% @ 240" oc
	Baccharis salicina / Willow Baccharis	269	10% @ 240" oc
	Celtis laevigata reticulata / Netleaf Hackberry	269	10% @ 240" oc
	Forestiera pubescens / Stretchberry	269	10% @ 240" oc
	Lycium torreyi / Torrey Wolfberry	269	10% @ 240" oc
	Populus deltoides wislizeni / Rio Grande Cottonwood	269	10% @ 240" oc
	Populus fremontii / Fremont Cottonwood	269	10% @ 240" oc
	Rhus trilobata / Skunkbush Sumac	269	10% @ 240" oc
	Ribes aureum / Golden Currant	269	10% @ 240" oc
	GOODDING'S WILLOW FLOODED FOREST (AREA 5)	487,139 sf	
	Baccharis salicifolia / Mulefat	740	15% @ 120" oc
	Baccharis salicina / Willow Baccharis	740	15% @ 120" oc
	Forestiera pubescens / Stretchberry	740	15% @ 120" oc
	Platanus wrightii / Arizona Sycamore	180	15% @ 240" oc
	Rhus trilobata / Skunkbush Sumac	180	15% @ 240" oc
	Salix gooddingii / Gooddings Willow	317	25% @ 240" oc
	WILLOW BACCHARIS SOUTHERN GREAT PLAINS ALLIANCE (WEG#)	614,299 sf	
	Amorpha fruticosa / False Indigo	638	10% @ 120" oc
	Baccharis salicina / Willow Baccharis	638	10% @ 120" oc
	Forestiera pubescens / Stretchberry	638	10% @ 120" oc
	Lycium torreyi / Torrey Wolfberry	638	10% @ 120" oc
	Ribes aureum / Golden Currant	638	10% @ 120" oc
	Salix exigua / Narrowleaf Willow	638	10% @ 120" oc

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SWCA Environmental Consultants
15 Research Drive
Amherst, MA 01002
(p) 413.256.0252
(f) 413.256.1952
www.swca.com

Prepared for:
Natural Resources Conservation Service New Mexico

DRAFT

Project Title:
RHODES PROPERTY RESTORATION

Sheet Title:
CONCEPTUAL LANDSCAPE PLAN WITH HYDROLOGIC MODEL UNDERLAY

Date:	6/1/2022
Scale:	As Shown
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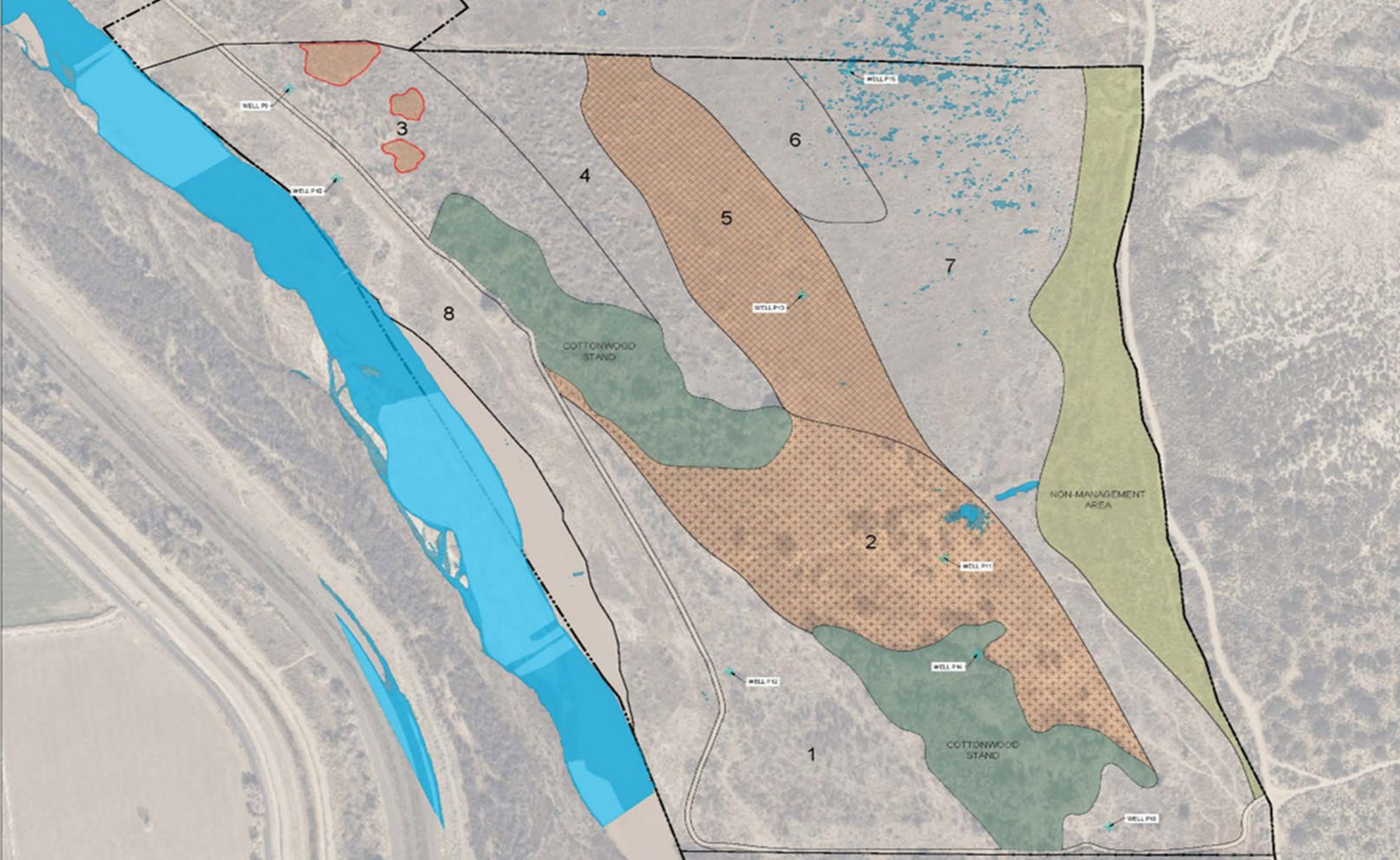
REVISIONS

Date	By	Note



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LEGEND

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Project Title:
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Sheet Title:
HYDROLOGIC MODELING

Date:	
Scale:	
Drawn by:	
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REVISIONS

Date:	By:	Note:

Sheet No:

Dream Palette

PLANT PALETTE

Goodding's Willow Flooded Forest (Area 5)	Baccharis salicina	willow baccharis
	Baccharis salicifolia	mulefat
	Forestiera pubescens	New Mexico olive (stretchberry)
	Platanus wrightii	Arizona sycamore
	Rhus trilobata	skunkbush sumac
	Salix gooddingii	Goodding's willow
Warm Desert Riparian Low Bosque & Shrubland (Areas 1, 4, & 6)	Baccharis salicifolia	mulefat
	Prosopis glandulosa	honey mesquite
	Prosopis pubescens	screwbean mesquite
	Salix exigua	narrowleaf willow
	Shepherdia argentea	silverleaf buffaloberry
Rio Grande Cottonwood Alliance (Areas 2 and 3)	Acer negundo	box elder
	Amorpha fruticosa	false indigobush
	Baccharis salicina	willow baccharis
	Celtis laevigata var. reticulata	Netleaf hackberry
	Forestiera pubescens	New Mexico olive (stretchberry)
	Fraxinus velutina	velvet ash
	Lycium torreyi	Torrey's wolfberry
	Populus deltoides ssp. wislizeni	Rio Grande cottonwood
	Populus fremontii	Fremont cottonwood
	Rhus trilobata	skunkbush sumac
	Ribes aureum	golden currant
Willow Baccharis Southern Great Plains Wash Scrub Alliance (Area 8)	Amorpha fruticosa	false indigobush
	Baccharis salicina	willow baccharis
	Forestiera pubescens	New Mexico olive (stretchberry)
	Lycium torreyi	Torrey's wolfberry
	Ribes aureum	golden currant
	Salix exigua	narrowleaf willow

Chihuahuan Semi-desert Grassland (Area 7)	Asclepias speciosa	showy milkweed
	Atriplex canescens	Fourwing saltbush
	Bouteloua curtipendula	Sideoats Grama
	Digitaria californica	Arizona Cottontop
	Distichlis spicata	Inland saltgrass
	Eriogonum annuum	Annual Buckwheat
	Fallugia paradoxa	Apache plume
	Flourensia cernua	American tarwart
	Gutierrezia sarothrae	Broom snakeweed
	Muhlenbergia asperifolia	scratchgrass
	Muhlenbergia emersleyi	bullgrass
	Panicum obtusum	Vine Mesquite
	Pleuraphis mutica	tobosagrass
	Rhus microphylla	littleleaf sumac
	Sphaeralcea coccinea	Scarlet globemallow
	Sporobolus airoides	Alkali Sacaton
	Sporobolus wrightii	Giant Sacaton

Consider Phased Approach

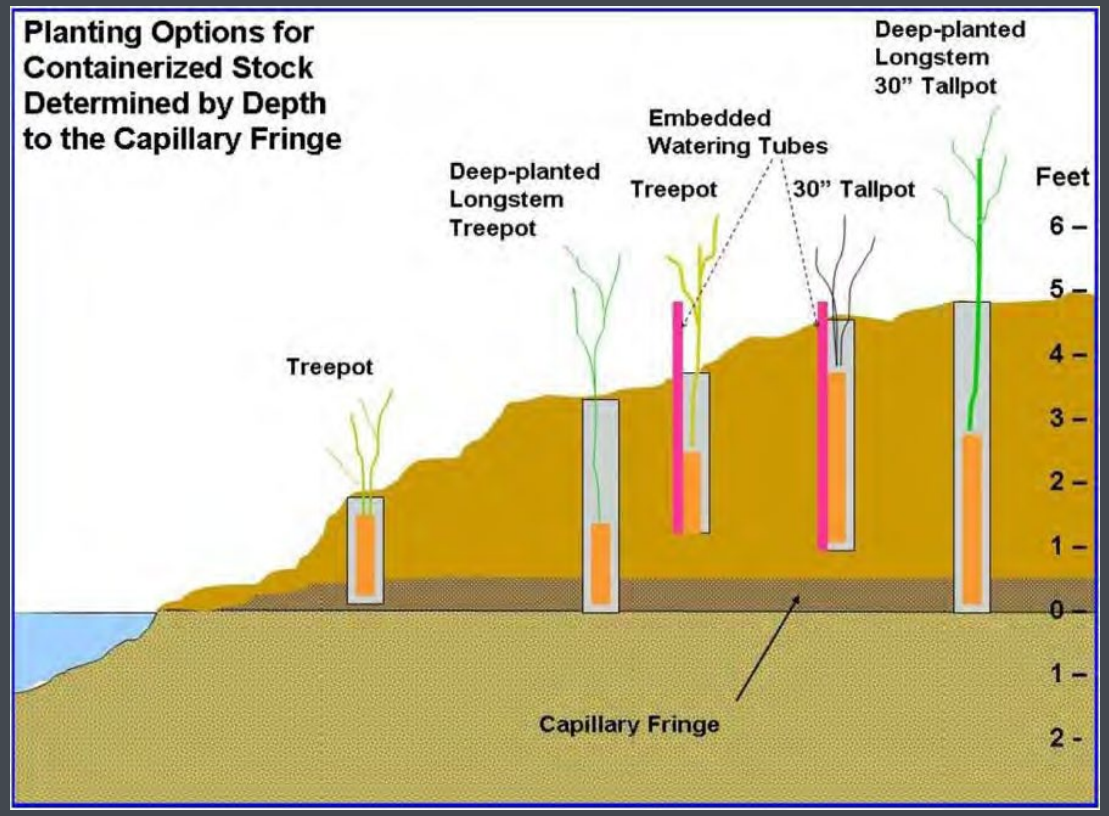
PHASE 1: PLANT PALETTE

Table 2. Prescriptions followed for riparian species plantings on the Bosque del Apache National Wildlife Refuge (NWR), Socorro, NM, from 1989 to 1993.

Species	Soil type	Soil salinity[a]	Depth to water table
Cottonwood	sand–loam	< 3.0	1.8–3.6
Black willow	sand–clayloam	< 4.0	1.2–2.4
New Mexico olive	sand–loam	< 3.0	< 1.2
Skunkbush sumac	sand–loam	< 3.0	< 1.2
Silver buffaloberry	loam–clayloam	< 3.0	< 1.2
Screwbean mesquite	clay–loam	3–8	< 1.2
Wolfberry	sand–loam	3–8	< 1.2
Fourwing saltbush	sand–loam	8–14	< 2.0

[a] Based on experience, the NWR has modified acceptable salinity levels for plantings downward as follows: cottonwood, 1.0 to 2.0 dS/m; black willow, New Mexico olive, skunkbush sumac, and silver buffaloberry, 1.0 to 2.5 dS/m (B. W. Anderson, personal communication).

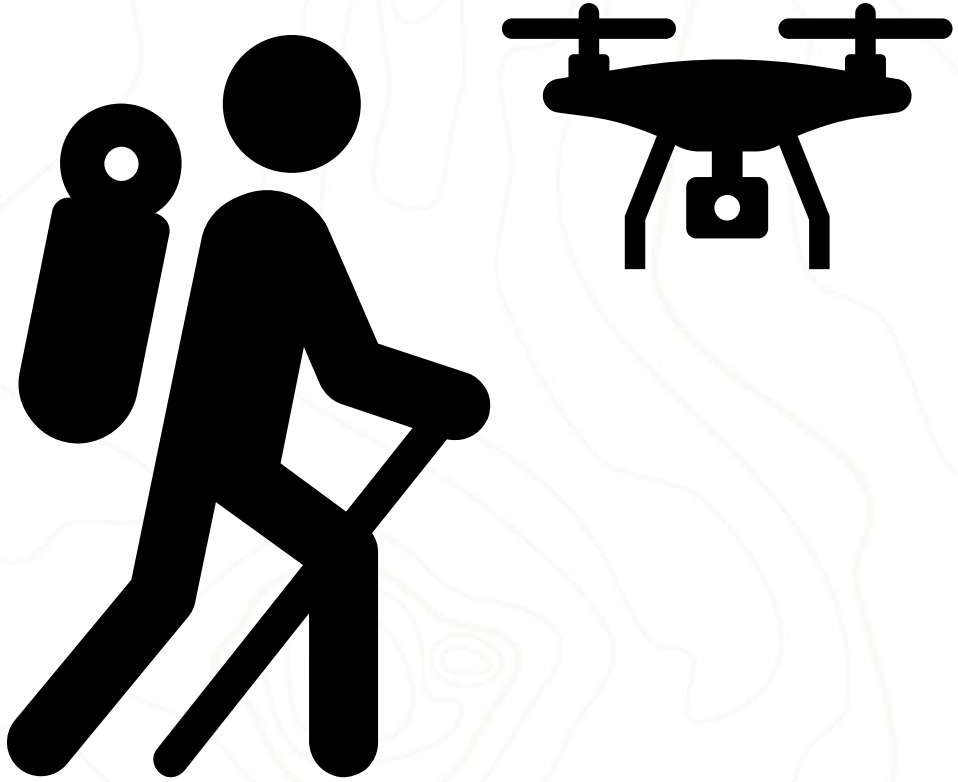
(Taylor and McDaniel 1988)

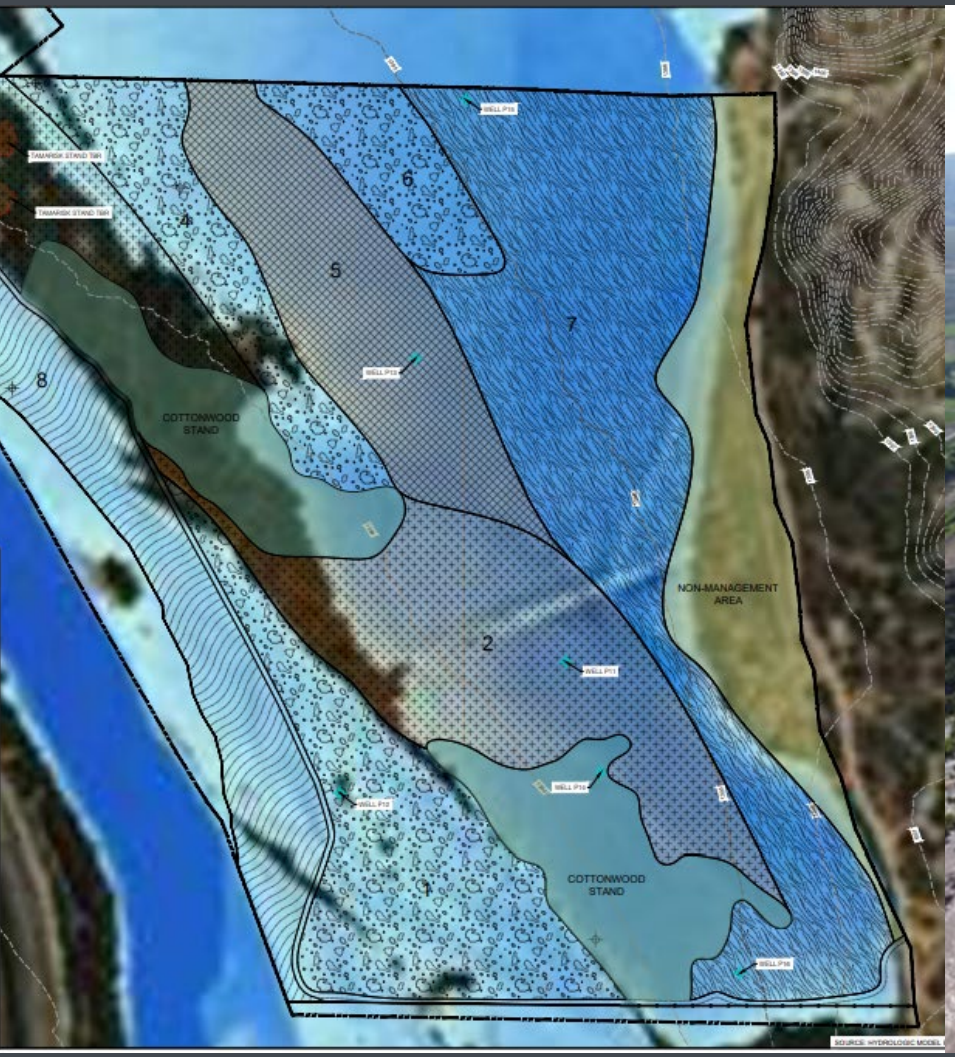


(Fenchel et al.)

Qualified Contractors

Monitor

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WELL P18
1
2
4
5
6
7
8
COTTONWOOD STAND
NON-MANAGEMENT AREA
COTTONWOOD STAND

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SUMMARY

- Have a clear goal but adapt
- Plan for extreme conditions
- Collect both desktop and field data
  - Use your field data to calibrate your models
- Start with your “dream” then scale back
  - Phased approach
    - Funding or material constraints
- Use the resources on site
  - Seed collection/ cuttings/ transplants
- Consider engineering
- Select a qualified contractor
- Monitor

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