

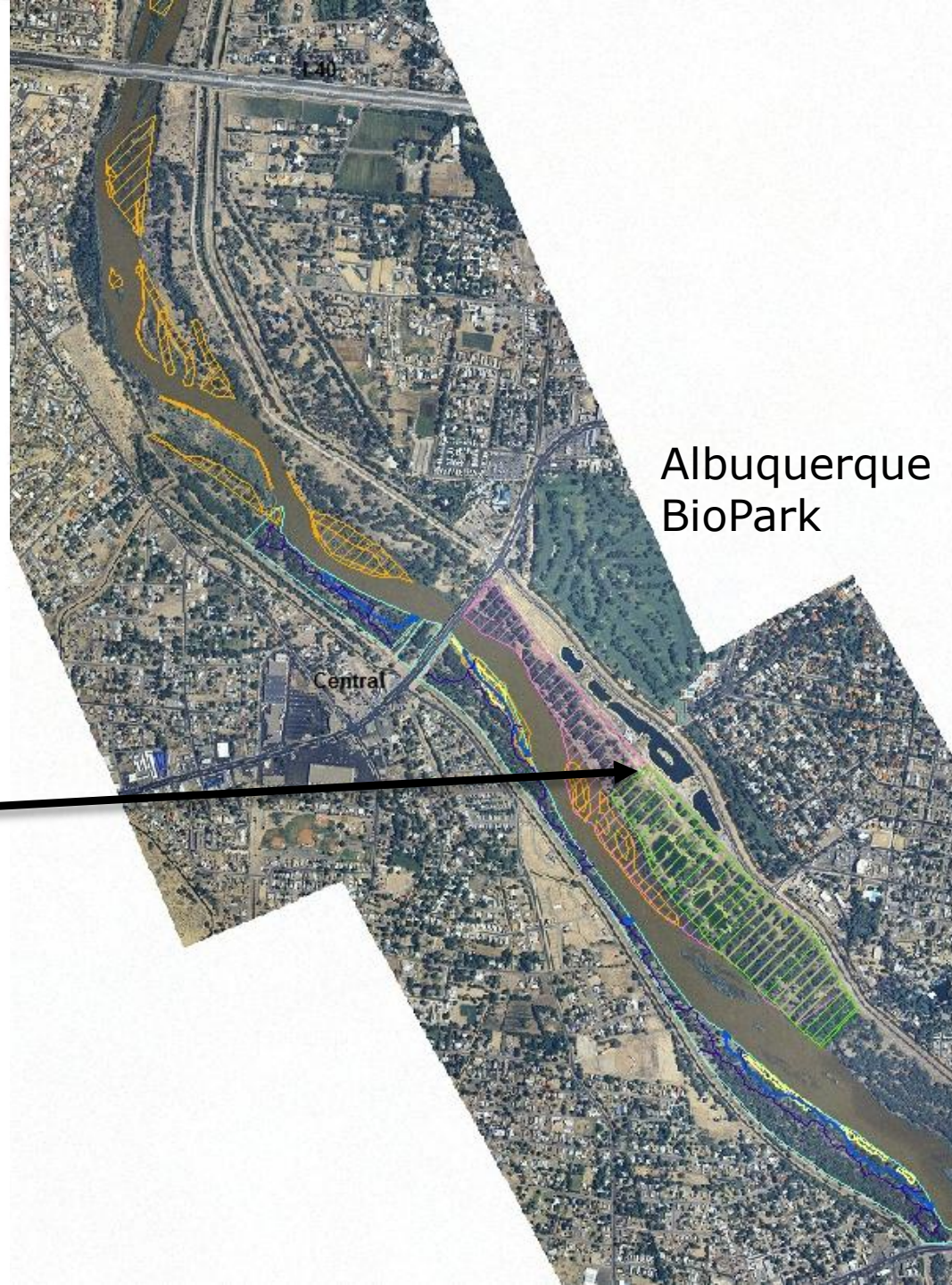
Wetland Restoration and Monitoring in the Southwest

Ondrea Hummel,
USACE Albuquerque District
June 6, 2012

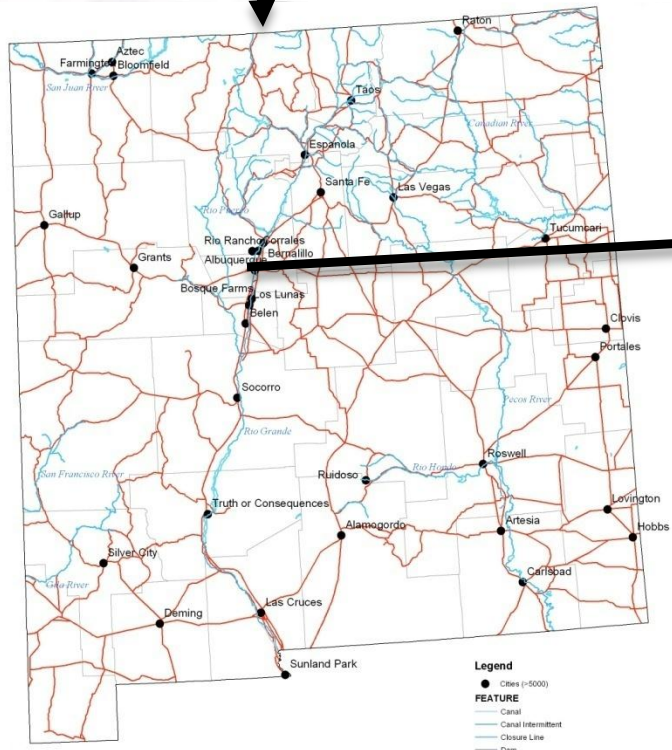


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WHERE WE ARE — U.S. ARMY CORPS OF ENGINEERS



Albuquerque BioPark



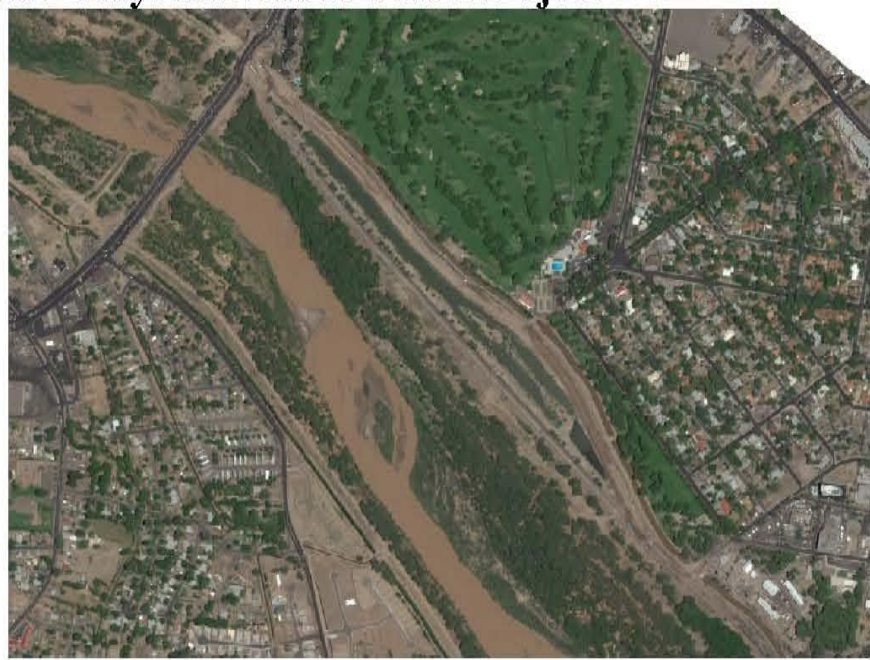
Albuquerque BioPark Wetland Restoration Project

- 1135 Ecosystem Restoration Project
- Total Cost - \$6.5 Million; 75% Federal
- Local Sponsor – City of Albuquerque
- Construction completed in 2006
- Implementing Monitoring Plan 2006 - Present

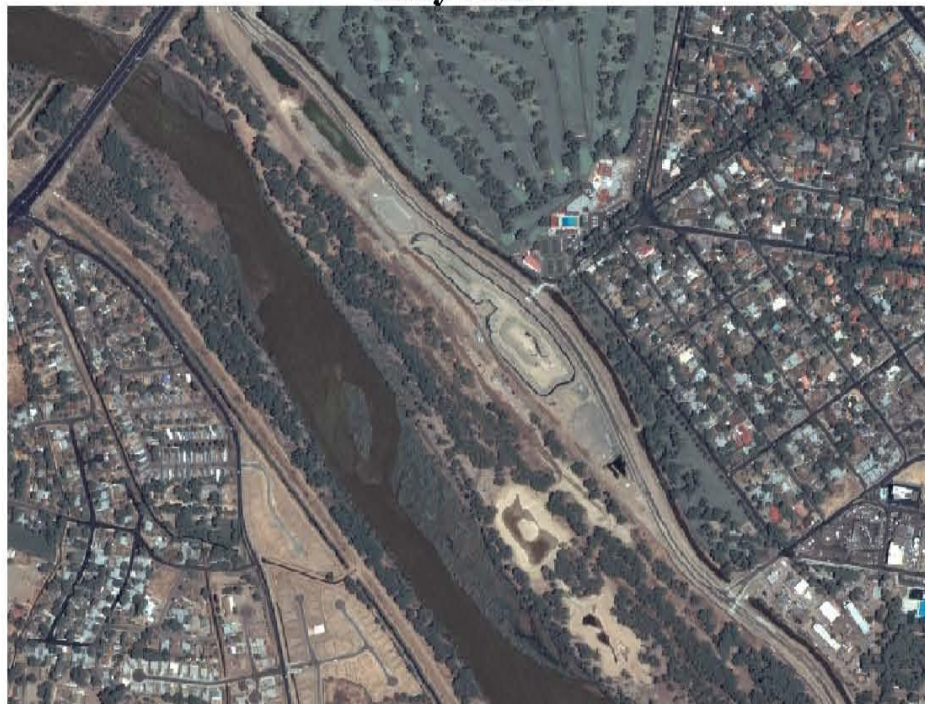




1999



July 2004



June 2005

Thinning
'treatments'
began in 2003-
2004

Albuquerque Bio-Park Environmental Restoration Project



Wet Meadow

Shallow Marsh

Restored Wetlands

Deep Marsh

Observation Area

Observation Area

Marsh Trail

Marsh Trail Entrance

Marsh Trail Entrance

Zoo Biopark Train

Rio Grande

Alexander Road

Central Avenue

South Pond

Central Pond

Aquatic Park

Children's Pond

Model Boat Pond

Tingley Drive

Riverside Drain

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Bohannon & Huston
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Ongoing monitoring

- Avian Monitoring
- Bosque Ecosystem Monitoring Program (BEMP) site
- Surface Water Groundwater Monitoring
- Analysis for adaptive management and design of future similar projects
- Additional project features to be monitored in the future

Avian surveys

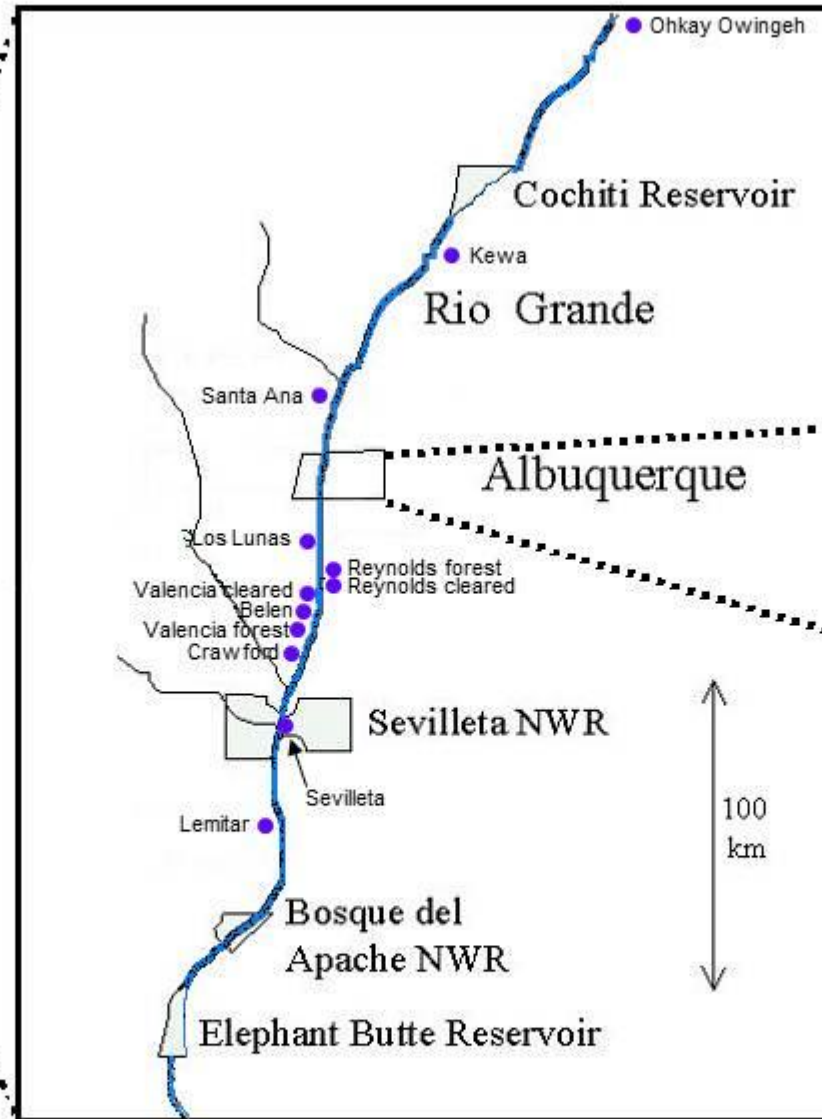
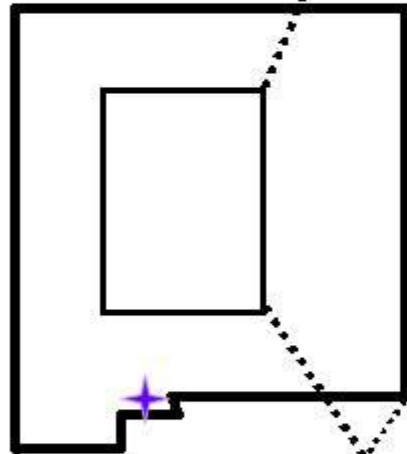


Data set since 2003

- Avian surveys – raptors, tree and ground nesting species
 - Raptor and Songbird Monitoring – Performed annually by Hawks Aloft; comparison of years and ‘treatments’
 - General decrease in avian numbers initially after treatment, but overall increase in population and number of species, especially when water features constructed
- Southwestern Willow Flycatcher Surveys
 - Migrant use of stopover habitat

Did you know???

BEMP has a total of **26 research sites** spanning 560 km (350 miles) of the middle Rio Grande valley! The **26th site** (noted as a **star** ✨ in the map below) at Mesilla Valley State Park began data collections in the summer of 2011.

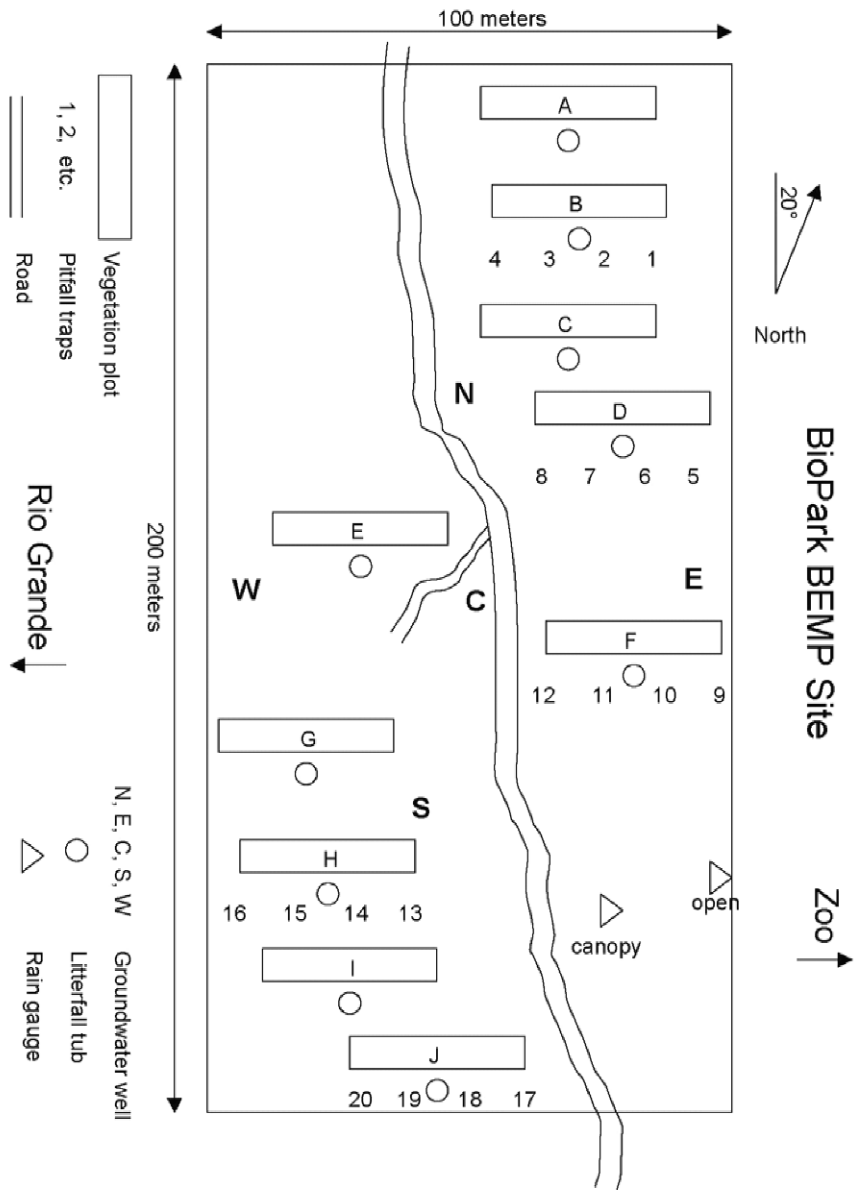


Albuquerque

OUR MISSION

The mission of the Bosque Ecosystem Monitoring Program (BEMP) is collaborative **long-term** ecological monitoring of key abiotic and biotic processes and characteristics to promote continued education, understanding and stewardship of the riparian ecosystem to scientists, teachers, students, policy makers and the public.

For more information:
www.bosqueschool.org/bemp.htm



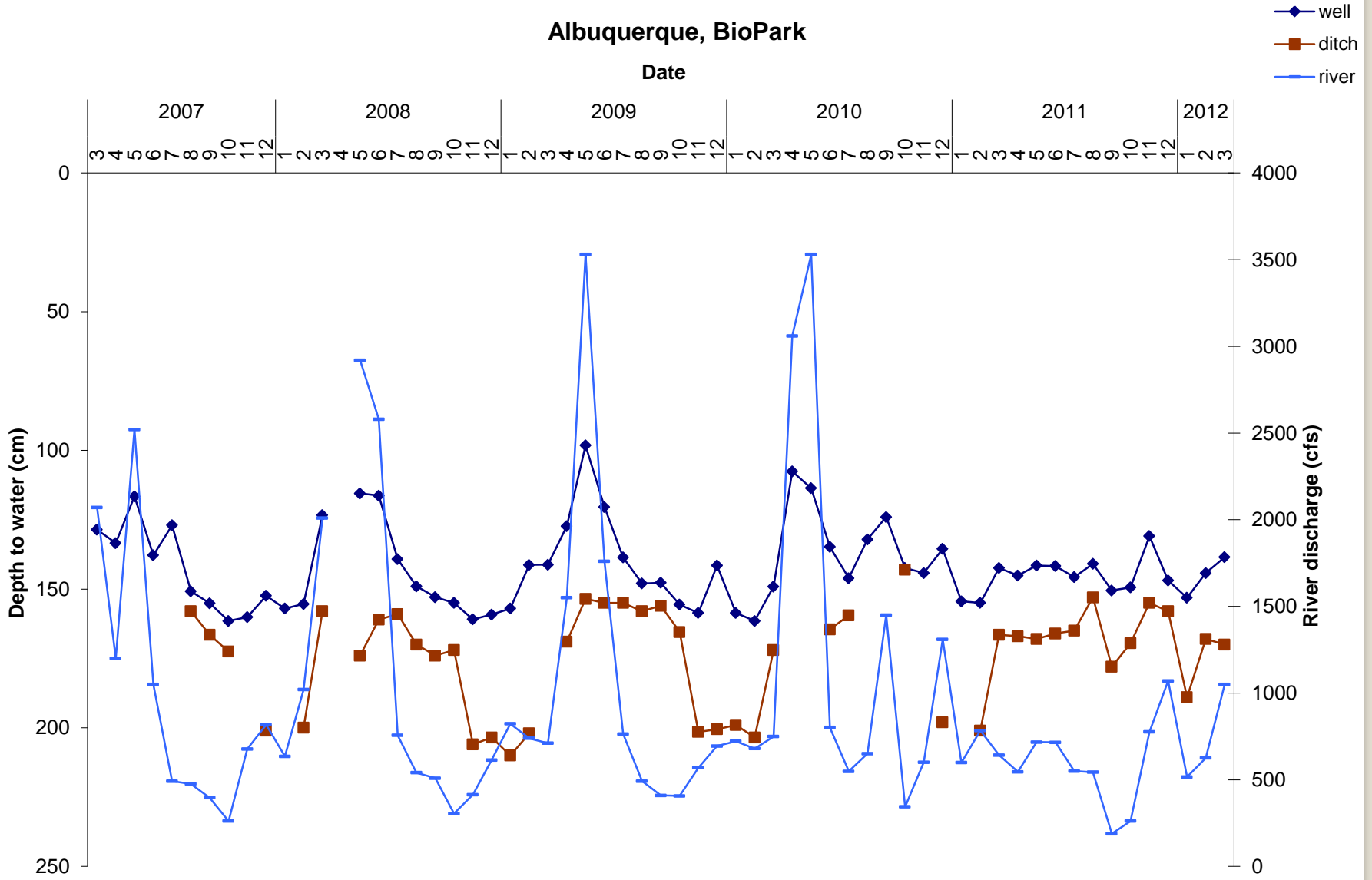
Bosque Ecosystem Monitoring Program (BEMP)

- Monitoring activities are synchronized between sites with volunteers (primarily grade K-12 students and their teachers) collecting long-term data on:
 - core weather data
 - shallow groundwater table depth
 - monthly precipitation
 - surface active arthropod activity
- measurements of forest production such as:
 - leaf litter biomass/plant productivity
 - tree diameter and growth rates
 - woody and herbaceous plant distribution



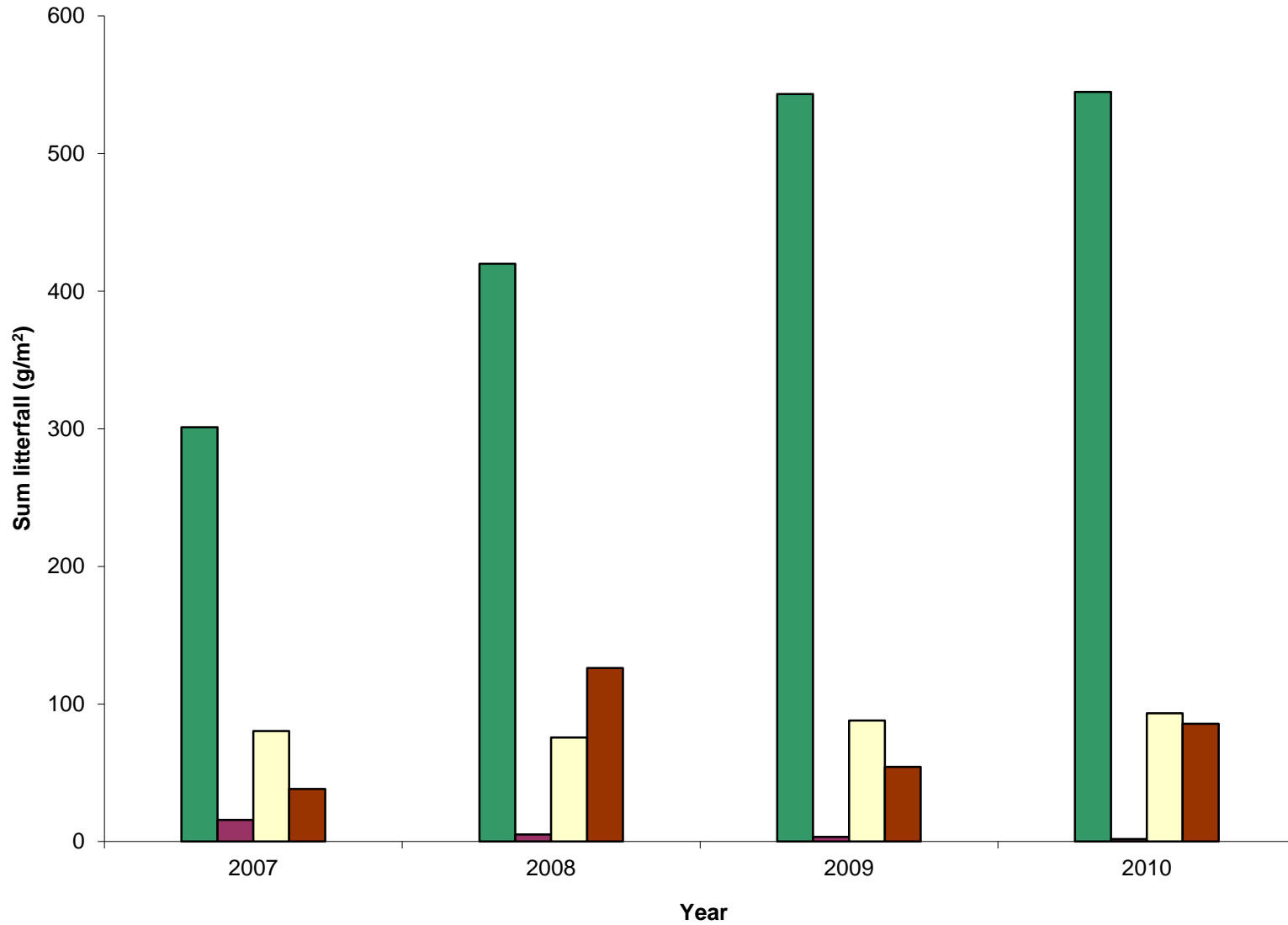
Albuquerque, BioPark

Date

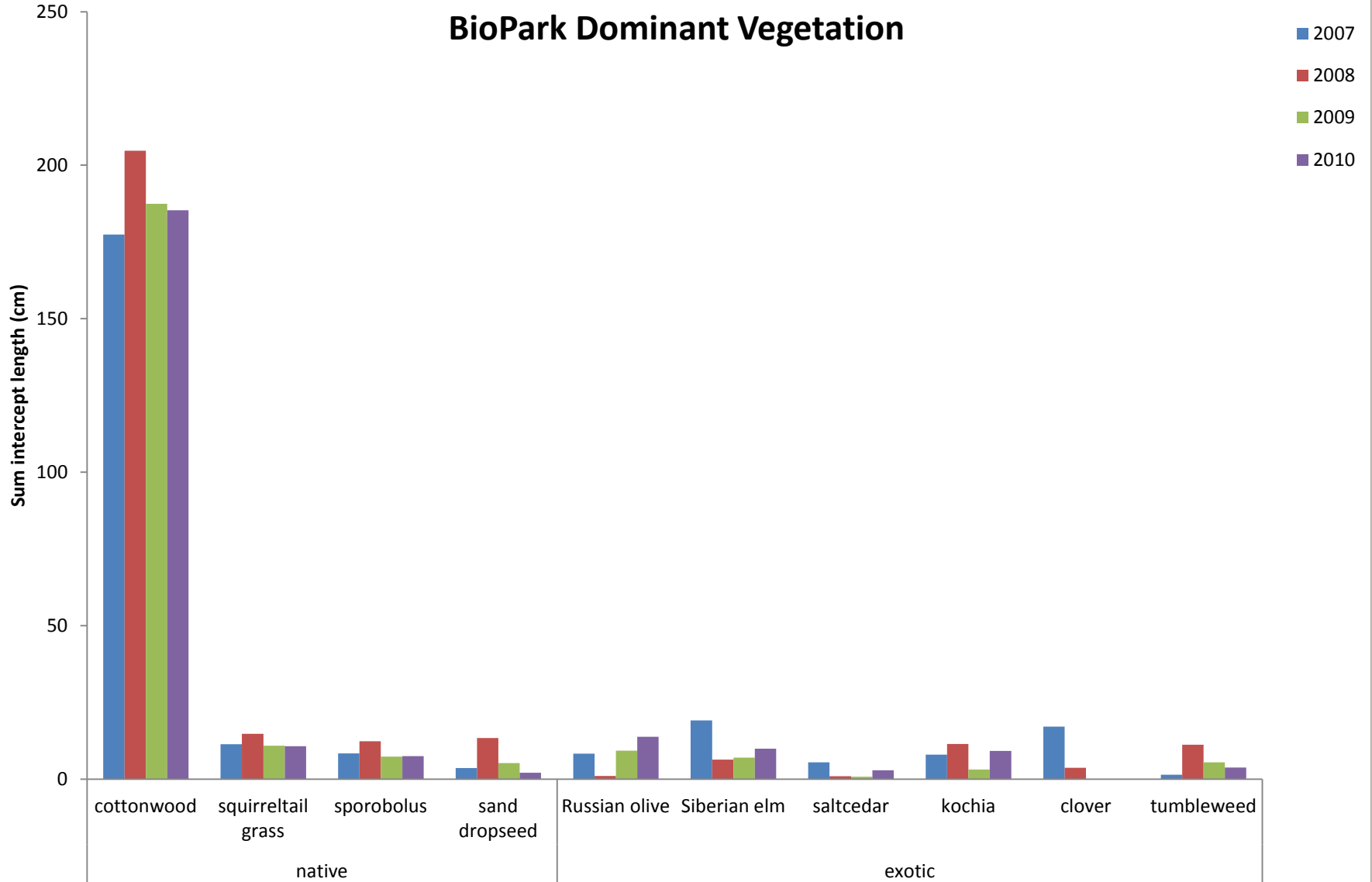


BioPark Litterfall

- native leaves
- exotic leaves
- reproductive parts
- wood



BioPark Dominant Vegetation



Need for understory
vegetation

Dominant species

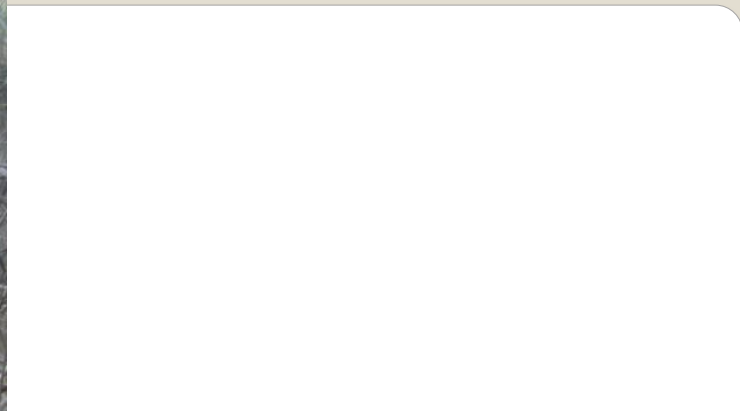
Surface water-ground water interaction studies

- Development of an understanding of the hydraulic connection between the river, ground water, and bosque soil moisture
- Ground water well clusters installed, detailed soils analysis of soil cores near each well has been conducted.
- Wetwater Services

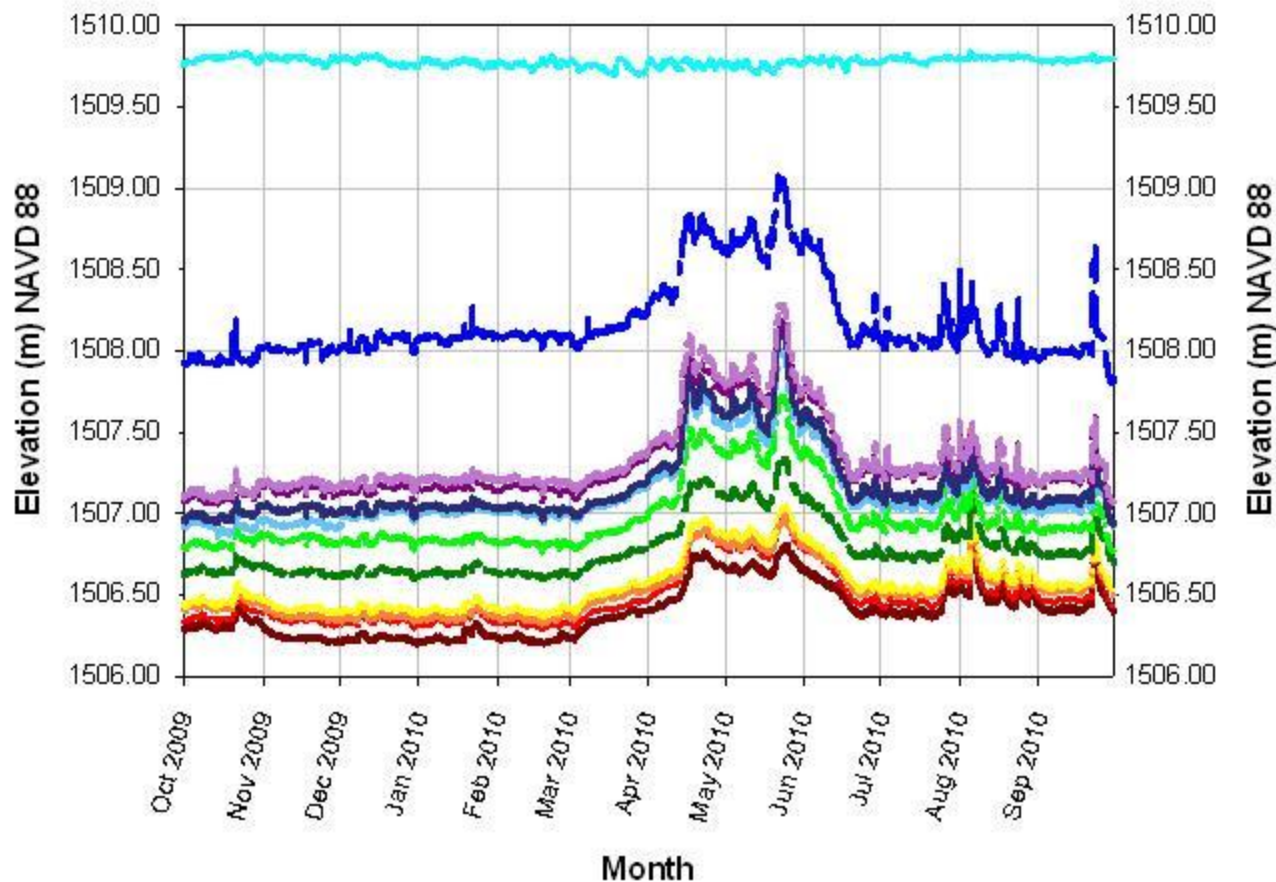




Image Source: Bernalillo County Orthoimagery, 2010



Water Year 2010 BioPark Wetland Complex



*Note: USGS data are provisional.

- BEMP East
- ... BEMP South
- BEMP North
- BEMP Center
- BEMP West
- Marsh
- Terrace North
- Terrace Center
- ... Terrace South
- Terrace West
- South Pond
- USGS #08330000 (Central Bridge)

Findings

- The majority of soils extracted and analyzed can be generally described as:
 - Poorly-graded sand, with and without gravel and small clay lenses
 - Silty-clay loams
 - Fine-sandy silt
- Depth to water table ranged from 1.9 feet above ground surface to 7.5 feet below ground surface.
- Longitudinal groundwater generally flows in a southeast direction at less than one-percent gradient and was found to have an inverse relationship with river stage height
- Since the shallow marsh is lined with tightly-packed clay, it has minimal hydrological connection with the system at this point.



Continued monitoring, especially in relation to additional restoration features to be constructed

Middle Rio Grande Restoration Project

Middle Rio Grande Restoration Project

Corrales / Sandia Project Area
 Alameda north to North Boundary
 Corrales - 4 project areas
 Sandia - 2 project areas
 RGVSP - 2 project areas

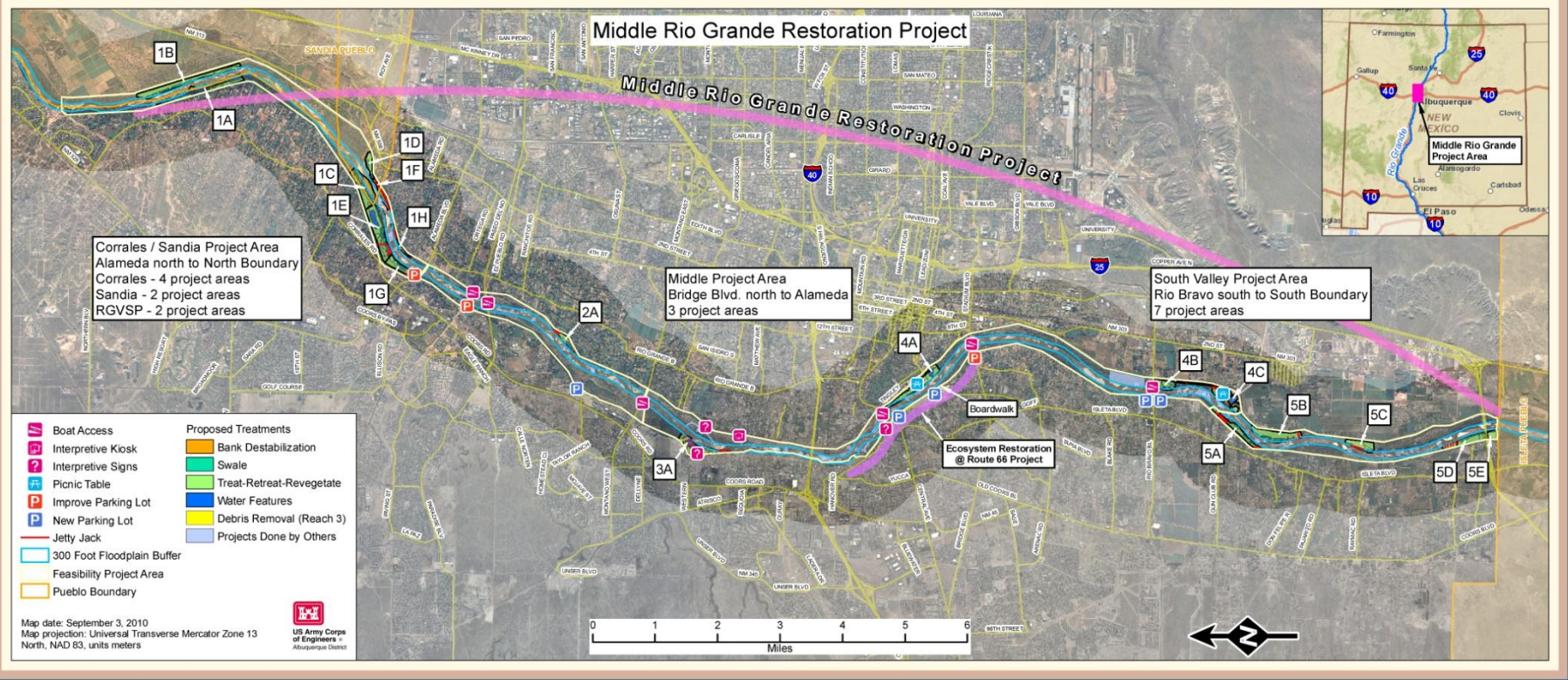
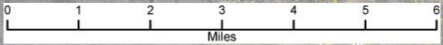
Middle Project Area
 Bridge Blvd. north to Alameda
 3 project areas

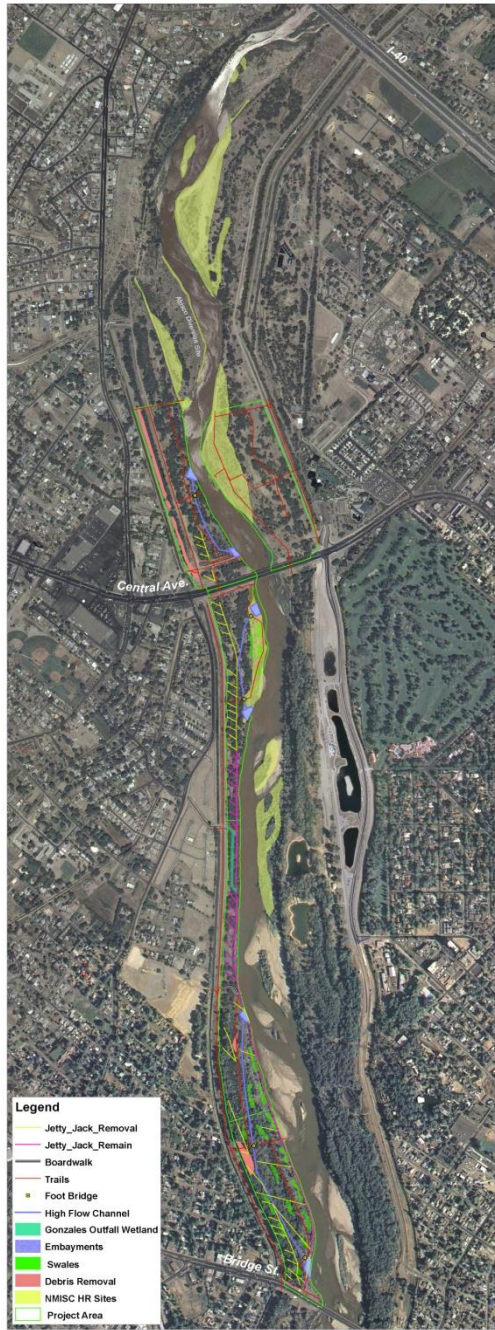
South Valley Project Area
 Rio Bravo south to South Boundary
 7 project areas



- | | |
|--|----------------------------|
| | Proposed Treatments |
| | Bank Destabilization |
| | Swale |
| | Treat-Retreat-Revegetate |
| | Water Features |
| | Debris Removal (Reach 3) |
| | Projects Done by Others |
| | |
| | |
| | |

Map date: September 3, 2010
 Map projection: Universal Transverse Mercator Zone 13
 North, NAD 83, units meters





Ecosystem Revitalization @ Route 66 Project



Central

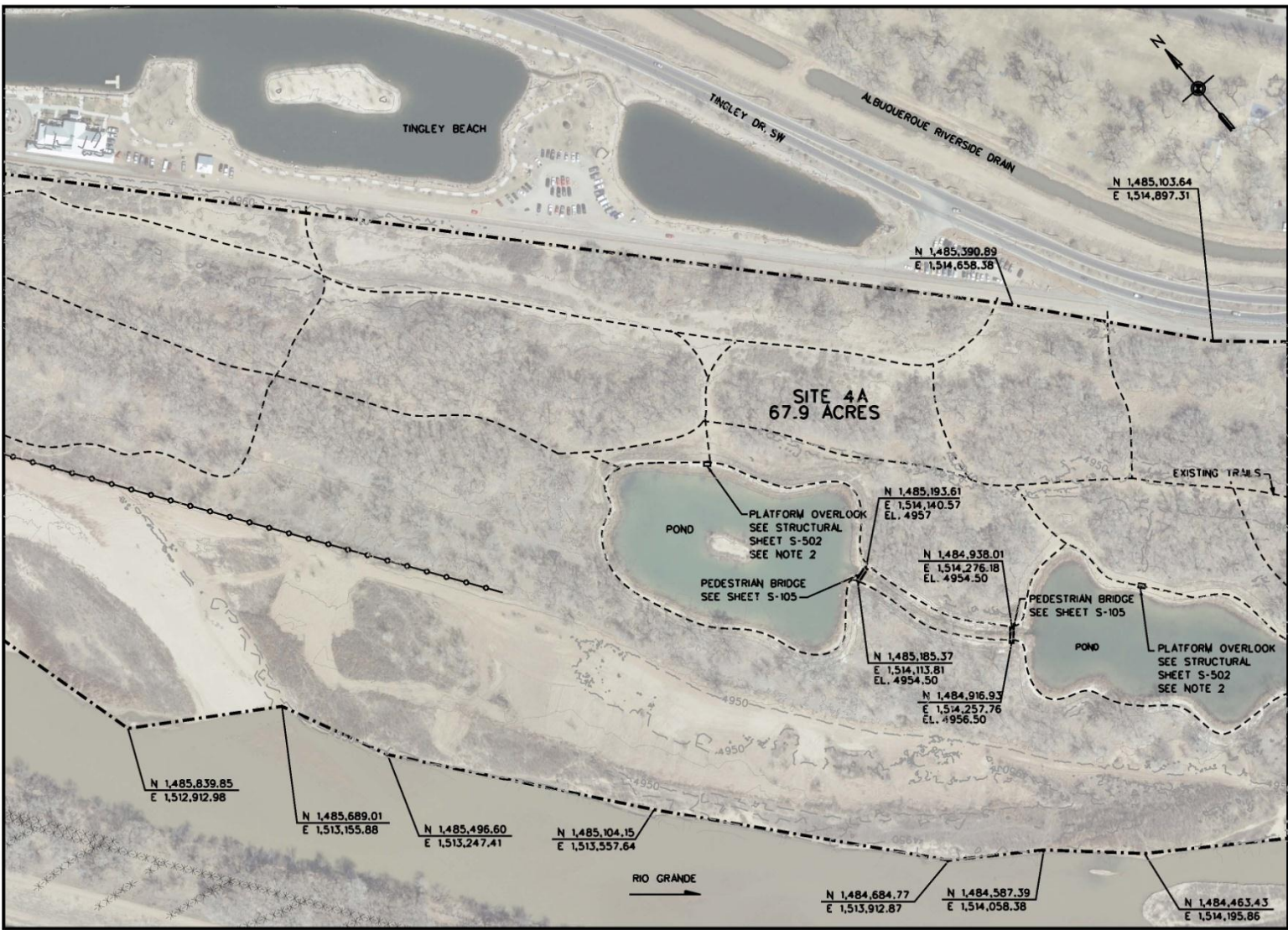
Bridge Blvd.

D

C

B

A



LEGEND

- TRAILS - EXISTING
- XXXXXXXXXX JETTY JACKS TO
- JETTY JACKS TO
- FUEL REDUCTION, THINNING, REVEGETATION CONSTRUCTION BY SEE SPECIFICATION

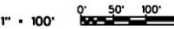
GENERAL NOTES

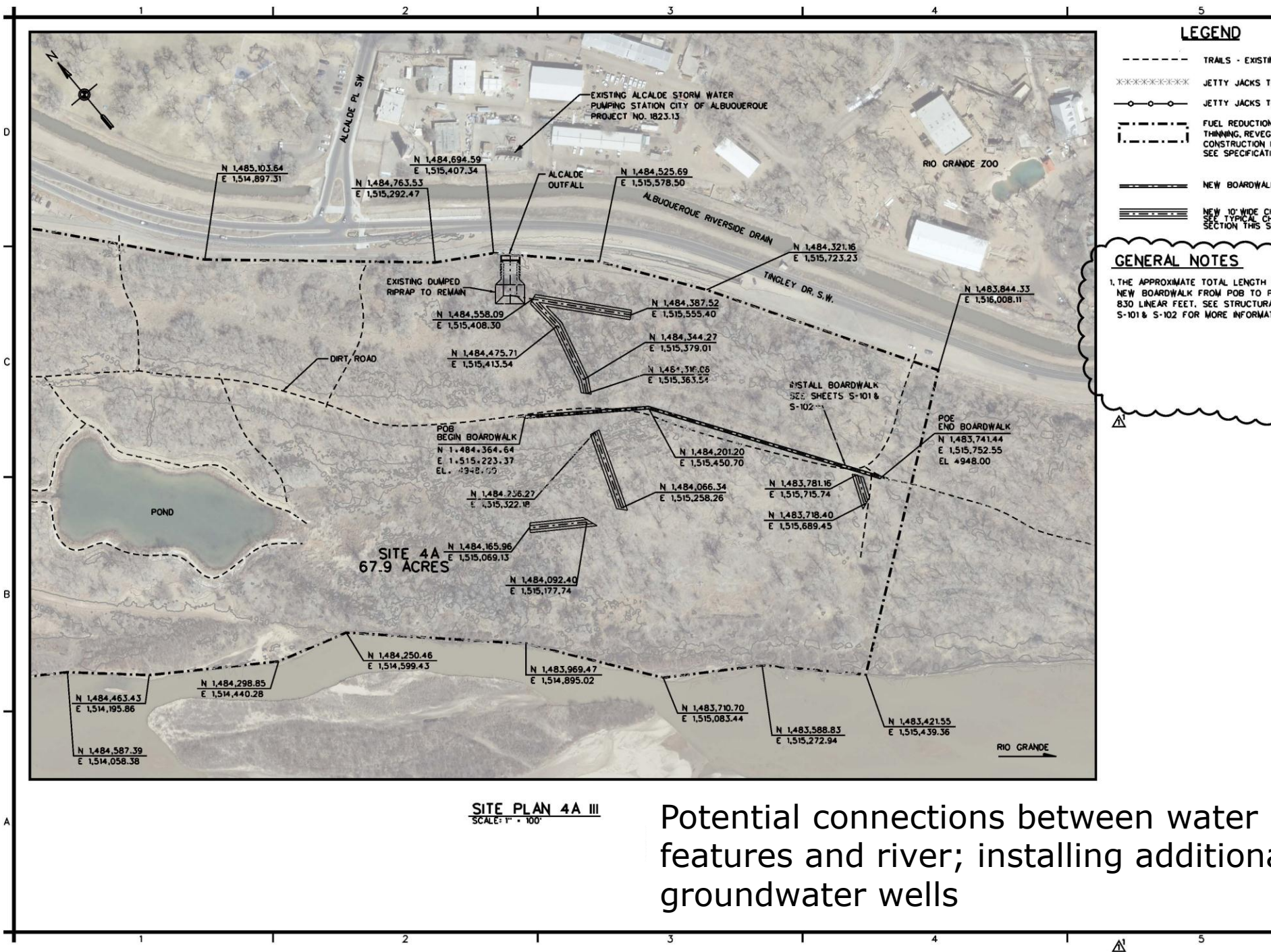
1. THE CONTRACTOR SHALL NOT DAMAGE EXISTING PONDS IN ANY WAY. IF DAMAGE DUE TO CONSTRUCTION ACTIVITIES IT BY THE CONTRACTOR AT NO EXPENSE TO THE GOVERNMENT.
2. PLATFORM OVERLOOK LOCATIONS ARE SHOWN. FINAL LOCATIONS WILL BE DETERMINED BY THE CONTRACTING OFFICER. WORK WILL NEED TO BE PERFORMED TO CREATE A NATURAL SURFACE TRAIL WITH A GRADE OF AT LEAST 1 ON 10 AT THE ENTRANCE OF PLATFORM OVERLOOK. THE ENTRANCE TO BE THE FULL WIDTH OF THE PLATFORM.

SITE PLAN 4A II

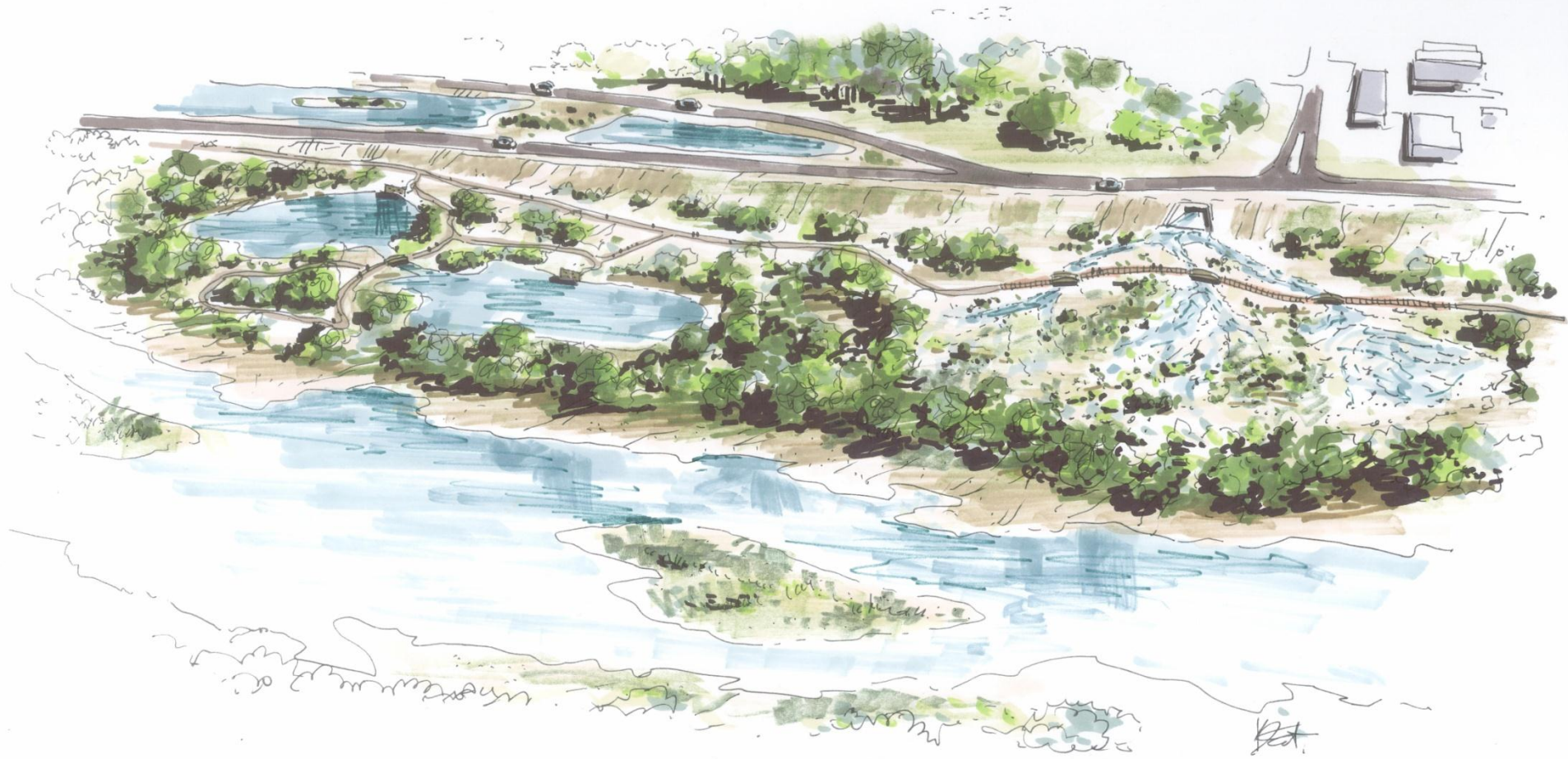
SCALE: 1" = 100'

FOR CONSTRUCTION





Potential connections between water features and river; installing additional groundwater wells



Ongoing Monitoring

- Vegetation monitoring – plantings, transects – overall % cover comparison with pre-project
- Hydrology - flood frequency, flood duration, depth, velocity, wetted area, groundwater depth
- Avian monitoring





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