



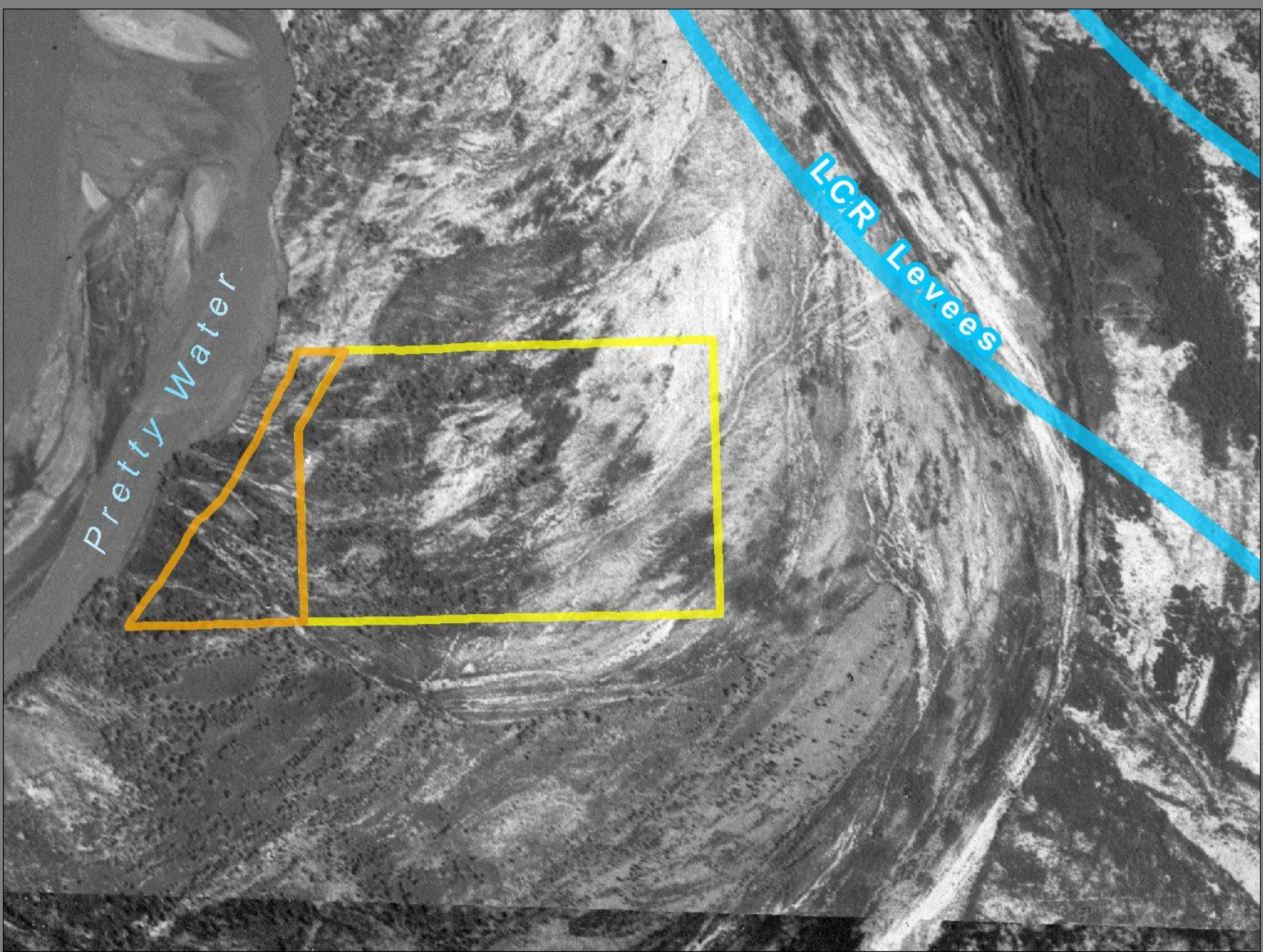
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Restoration Project Goal and Measures of Success

- Goal > Re-establish a diversity of local native plant species
- Measures of Success: Project deliverables vs. long term re-establishment of wildlife habitat
- Survival, Height, and Canopy Diameter

Success Determinants

- Select the right species
 - Know the existing site conditions in relation to the selected species growth requirements
 - Provide optimum growing conditions-water, weeds, and herbivory
 - Water-irrigation amount and timing
 - Weeds-salt cedar
 - Herbivory-protection in first two months of growth
- Monitor constantly and adjust as needed
- Apply adaptive Management



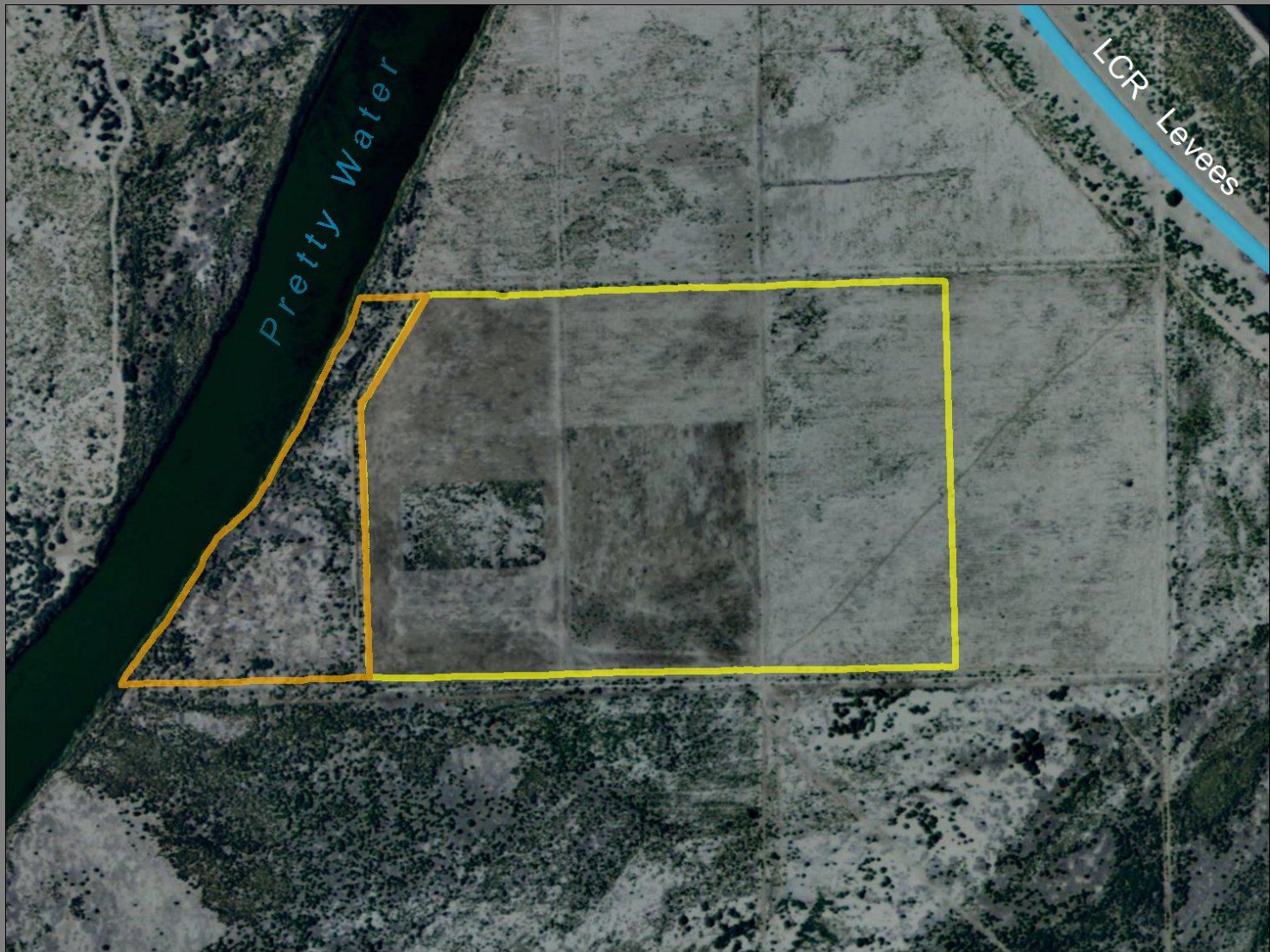
Pretty Water

LCR Levees

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Project Area in May of 2009 Showing Project Within Historic Agricultural Fields, Canals, and Road Layout





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Soil Profile
One of 27 within the project area

- Textures at all depths
- Stratification
- Structure
- Roots
- Soil Moisture
- Wetland/anaerobic conditions?
- Depth to Water

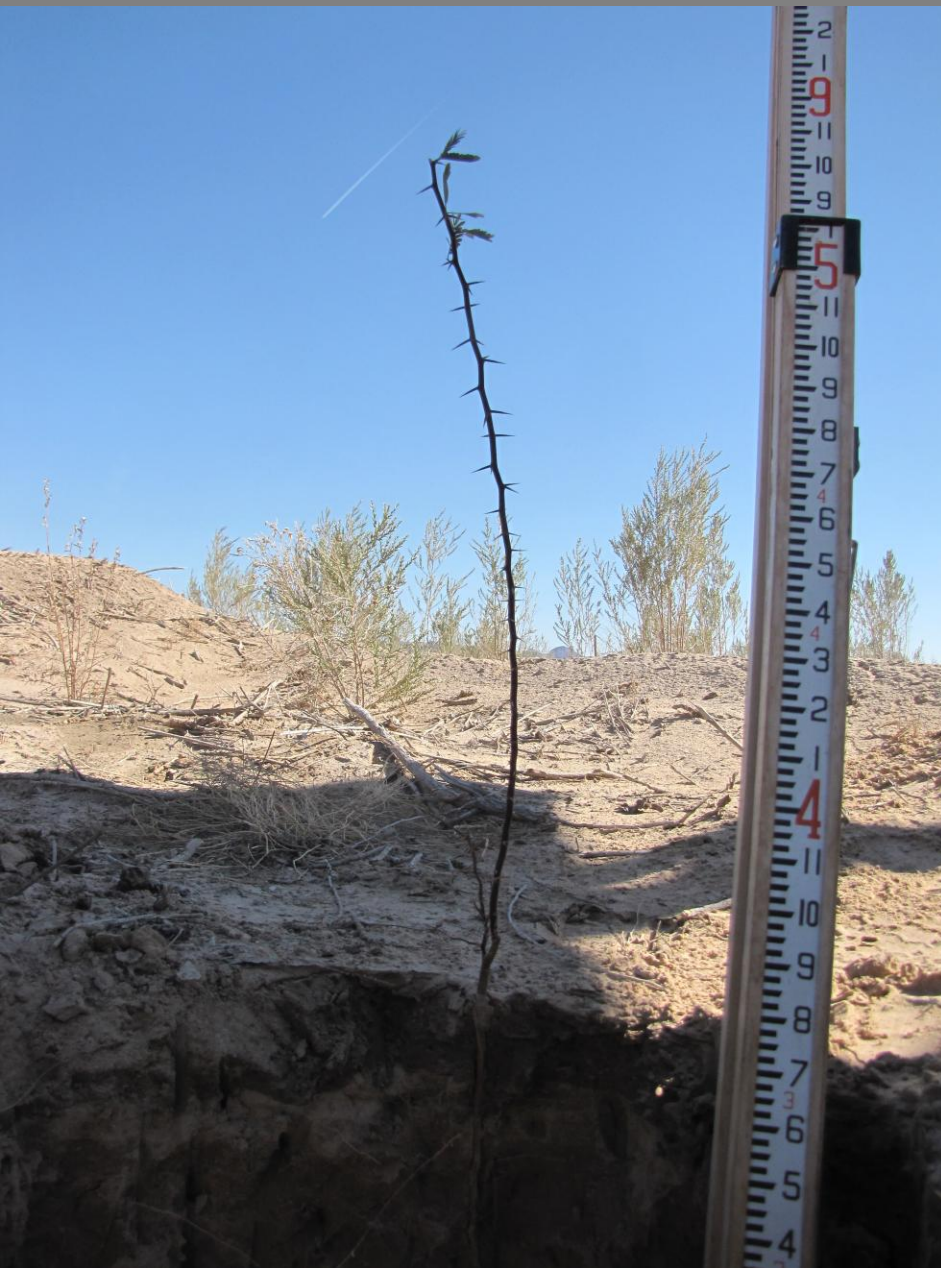
Historic wetland Soils at 12' Depth

Standing Water Across Site Ranges From 10-13.5. Mean Standing Water = 12



Western Honey Mesquite Recruit

Root Nodules Utilized by
Nitrogen fixing and absorbing
Bacteria





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Species Composition

Western Honey Mesquite	40%
Screwbean Mesquite	10%
Desert Ironwood	1%
Blue Palo Verde	1%
Catclaw acacia	8%
Big Saltbush	7%
Four-wing Saltbush	4%
Cattle Saltbush	4%
Creosote Bush	3%
Water Jacket	1%
Desert Broom	1%
Desert Globemallow	6%
Alkali Sakaton	10%
Inland Saltgrass	4%

Plant Communities

Mesquite Bosque

Saltbush Scrub Mix Herbaceous

Plant Spacing of 10' within
row x 18' between rows

-242 plants/acre

-13,300 plants

Spatial database for field
labeling and monitoring

First Year Planting Results

- 1) 45% of plants planted-remaining plants will be planted as available throughout 2011.
- 2) 94% survival of initial planting in late May through Mid June of 2010-All dead plant spaces replanted.
- 3) Mean Ht. of WHM = 1.6 meters
- 4) Mean Canopy of WHM = 1.3 meters

Salt Cedar Control

Within-row spraying with Rodeo and surfactant

Between row spot spraying and 10-acre Pretty Water site with Rodeo and Garlon 3E with surfactant

***Results: herbicide only moderately effective.
Key challenge for 2011.***

Species Recruiting to Site

<u>Species</u>	<u>Common Name</u>	<u>Native/Introduced</u>
<i>Tamarix rammosissima</i>	Salt Cedar	I
<i>Schismus arabicus</i>	Arabian schismus	I
<i>Sisymbrium altissimum</i>	Tall Tumblemustard	I
<i>Prosopis glandulosa ssp. torreyana</i>	Western Honey Mesquite	N
<i>Prosopis pubescens</i>	Screwbean	N
<i>Populus fremontii</i>	Fremont Cottonwood	N
<i>Salix gooddingii</i>	Gooddings willow	N
<i>Salix exigua</i>	Narrow leaf willow	N
<i>Atriplex lentiformis ssp. lentiformis</i>	Big Saltbush	N
<i>Larrea tridentata</i>	Creosote Bush	N
<i>Sphaeralcea ambigua ssp. rugosa</i>	Desert Globemallow	N
<i>Sesuvium verrucosum</i>	Verrucose sea purslane	N
<i>Bouteloua aristoides</i>	Needle Grama	N
<i>Pleuraphis rigida</i>	Big Galleta	N
<i>Perityle emuryi</i>	Emory's Rockdaisy	N
<i>Leptochloa panicea ssp. brachiata</i>	Mucronate Sprangeltop	N
<i>Heliotropium curassavicum</i>	Seaside Heliotrope	N
<i>Aristida adscensionis</i>	Sixweeks Threeawn	N



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Cibola, AZ National Wildlife Refuge





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