Restoration of Desert Wetlands Dominated by Tamarisk and Pampas Grass

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EcoSystems Restoration Associates

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Desert Wetlands...?

- These unique ecosystems support abundant diversity of plant and wildlife species
- EcoSystems Restoration Associates (ERA) was selected to provide design-build restoration services for this important and complex project.
- ERA's overall goal of this wetland enhancement project is to increase the functions and values of one disturbed wetland area and enhance and create habitat for 2 sensitive bird species.

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Project Location

- The All-American canal is located along the US/Mexican border in southeast California in Imperial County.

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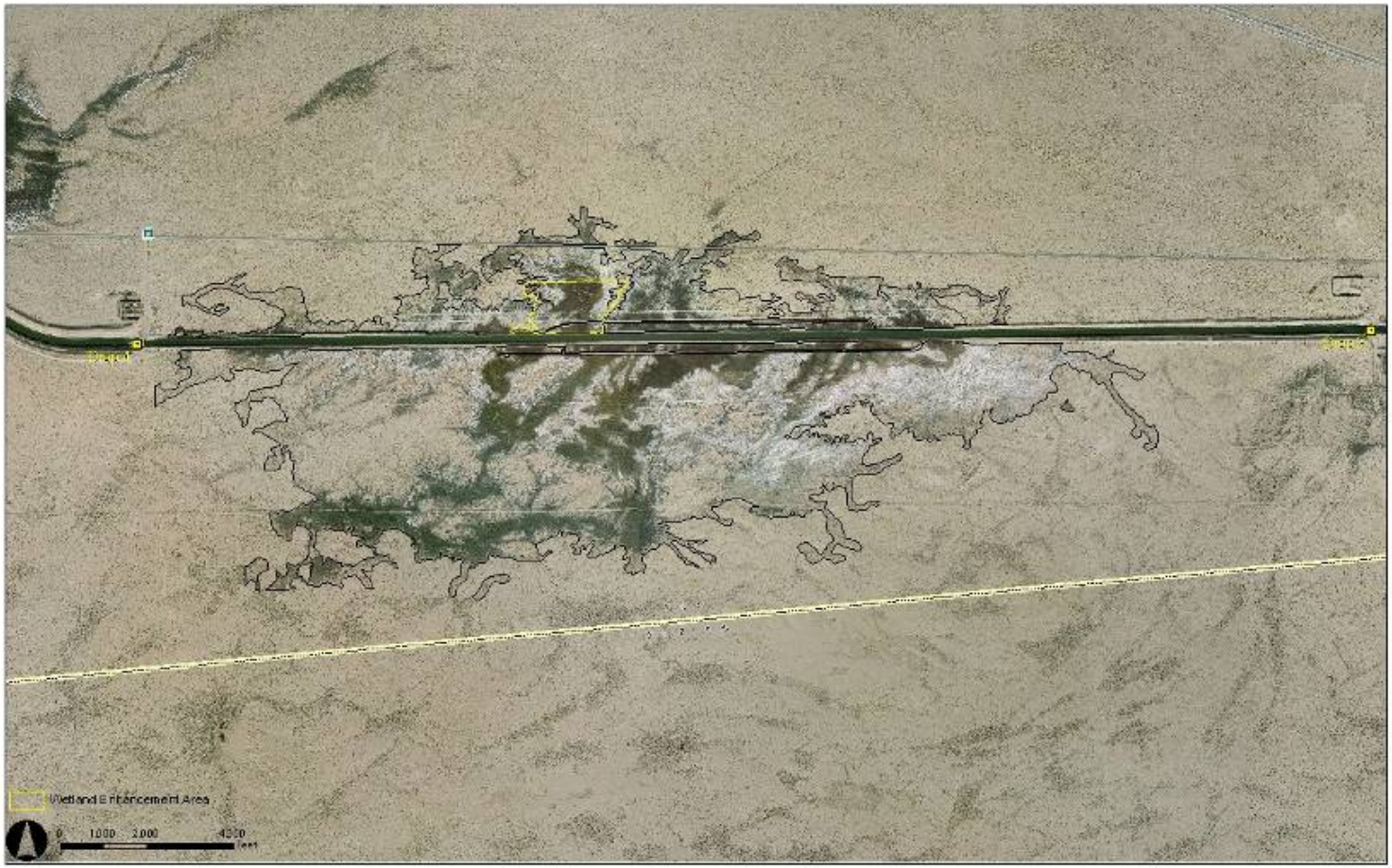
Wetland complex

The wetland complex area developed subsequent to the rise of the seepage induced groundwater ridge to near or above local ground elevation



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Wetland Restoration Site

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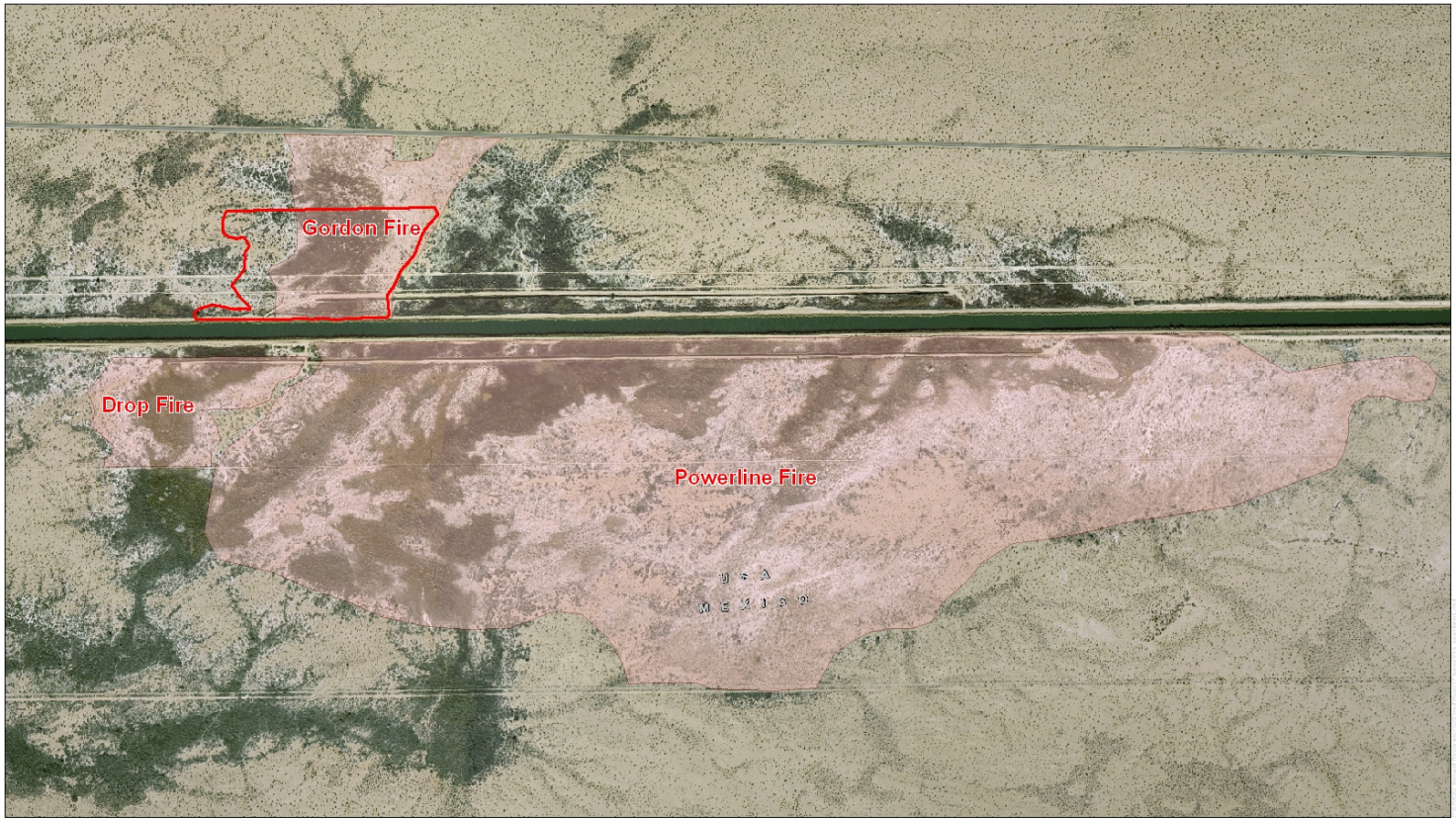
Objectives

- 44-Acre Wetland Enhancement Area:
  - Increase the functions and values of the disturbed wetland
  - Increase habitat diversity and heterogeneity
  - Reduce and control invasive species
  - Restore natural vegetation communities
  - Create and enhance habitat for the Yuma clapper rail and California black rail

Vegetative Obstacles

- Primary Invasive Species Present
  - Tamarisk (*Tamarix ramosissima*) – located throughout the wetland complex
  - Pampas Grass (*Cortaderia selloana)* – located along the periphery of freshwater marsh areas

Disturbance: Fire



- Fire has type-converted many natural communities to first and secondary sucessional vegetative communities

Type Converted Communities

1 inch equals 167 feet

Percentage of Non-native Cover in Restoration Area

Figure 9

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Restoration Parameters & Techniques

- The distribution and density of non-native species within the restoration area determined the removal techniques (4 categories)

- 1st Category
  - 0-15% cover by non-natives
  - Occurs within the saturated wetland & true desert areas
  - Tamarisk- (Cut-stump method, 100% AquaMaster or glyphosate)

Restoration Parameters & Techniques Contd.

- 2nd Category
  - 16-50% cover by non-natives
  - Occurs adjacent to freshwater marsh areas, primarily areas consisting of willow/cattail stands

  - Tamarisk (cut-stump, 100% glyphosate)
  - Pampas (remove seedheads; 5% foliar Garlon)

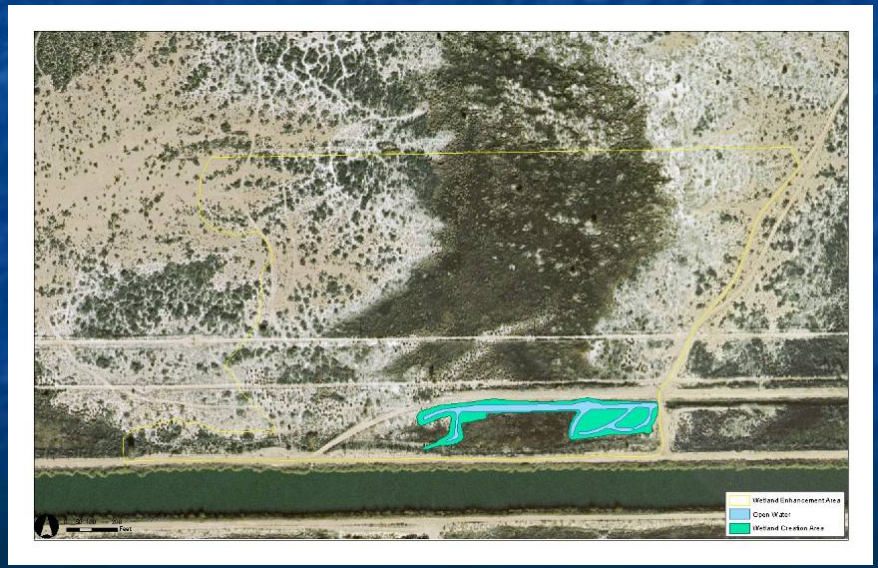
Restoration Parameters & Techniques Contd.

- 3rd Category
  - >51% cover by non-natives
  - Mechanical methods were used in conjunction with a re-emergent foliar herbicide application (5% solution)

Restoration Parameters & Techniques Contd.

- 4th Category
  - Areas >50% non-native cover that are to be enhanced for freshwater marsh habitat.


Yuma Clapper Rail, USFWS Photo by Jim Rorabaugh



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Challenges, failures, & successes of the initial restoration effort

- Removal Techniques
  - Mechanical
  - Cut-stump
  - Foliar spray
- Temperature
  - Chemical
  - Personnel
- Recruitment
  - Native/Non-native

Non-native Recruitment

- Recolonizing treated areas
  - Seed-bank
  - Wind Blown
  - Tracked in

- Ability to control-
  - **<u>Persistence and luck from nature</u>**

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Native Recruitment

- Native plant succession
  - Extremely successful in areas where mechanical grading occurred
    - Removal of non-native species reduced competition
    - Disturbance of soil by machinery
    - Change in groundwater availability and hydrologic regime

Integrative Management: Planting

- Approximately 6000 arroyo willow (*Salix lasiolepis*) and 100 black willow (*Salix goodingii*) cuttings were planted within the wetland complex
  - 9 - 14 days soaking
- In shadehouse
  - 4500 arroyo willow
  - 1000 cottonwood
  - 100 black willow
  - 100 white-stemmed milkweed
  - 1100 mesquite

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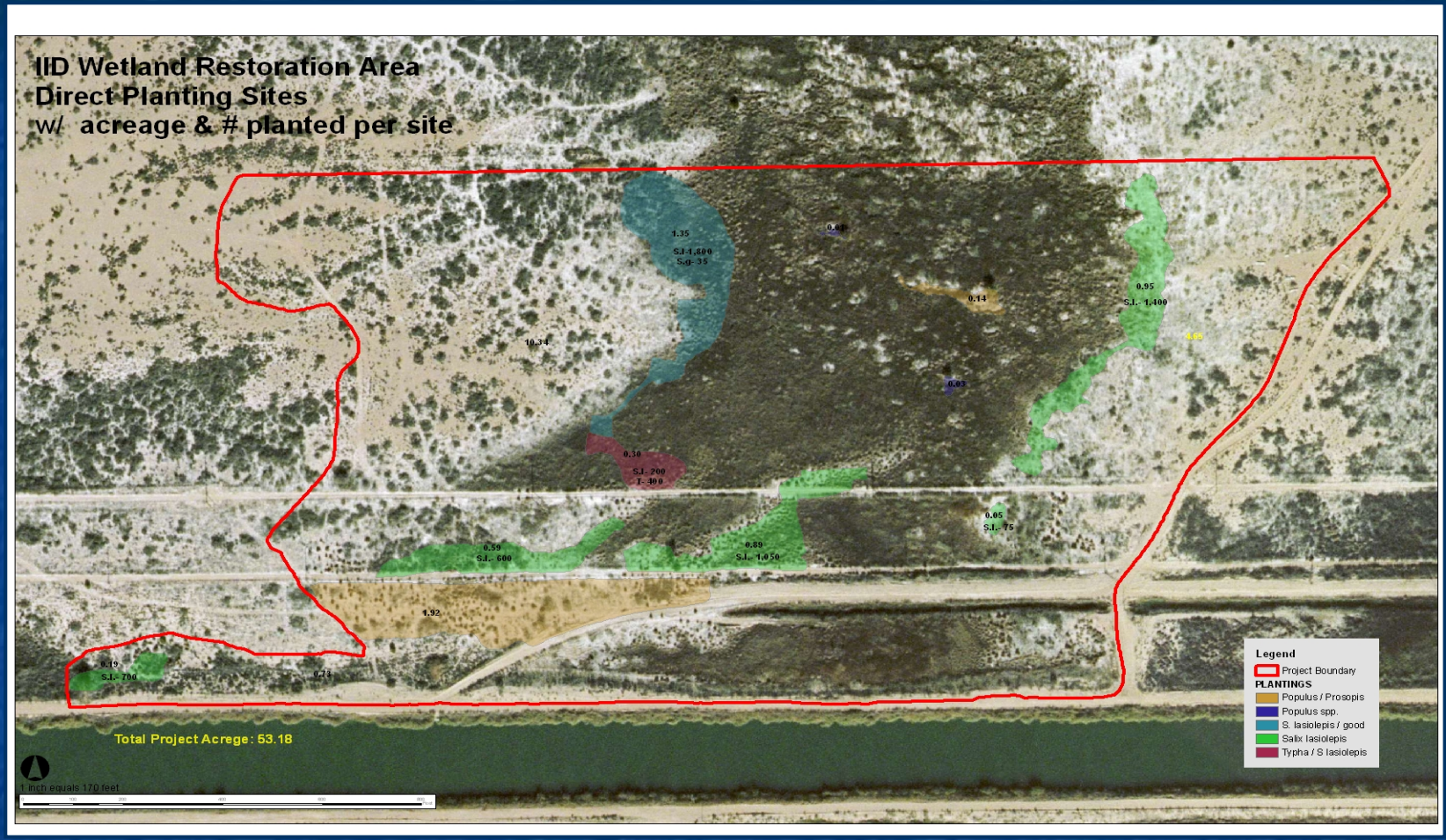
Planting Regimes

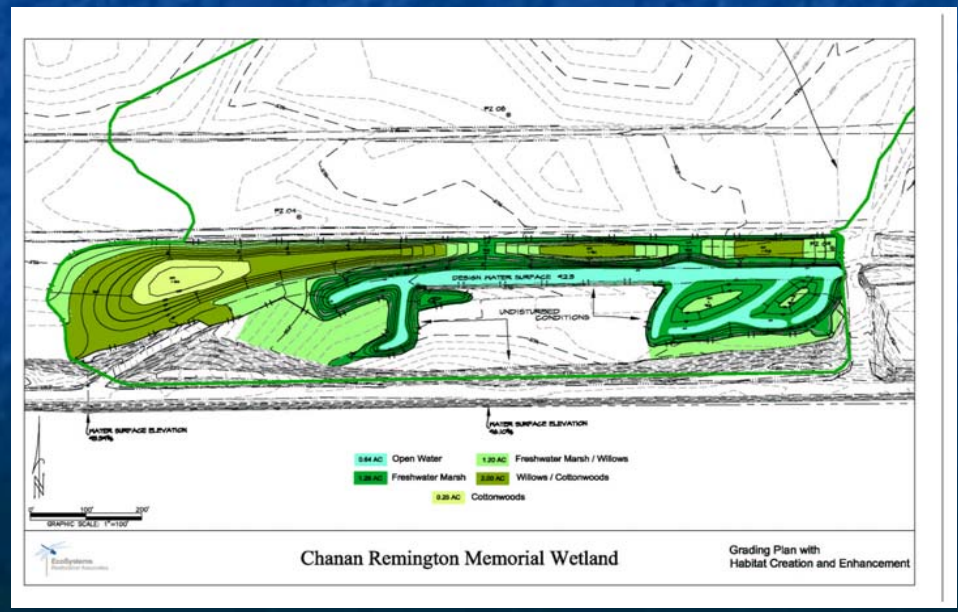


- Plantings occurred along periphery of existing wetland areas to increase the density and size of established wetlands

Future

- Maintenance will continue for the duration of the contract (10 years)

- A hydrological regime that simulates natural desert wetlands will be implemented to provide natives a competitive advantage



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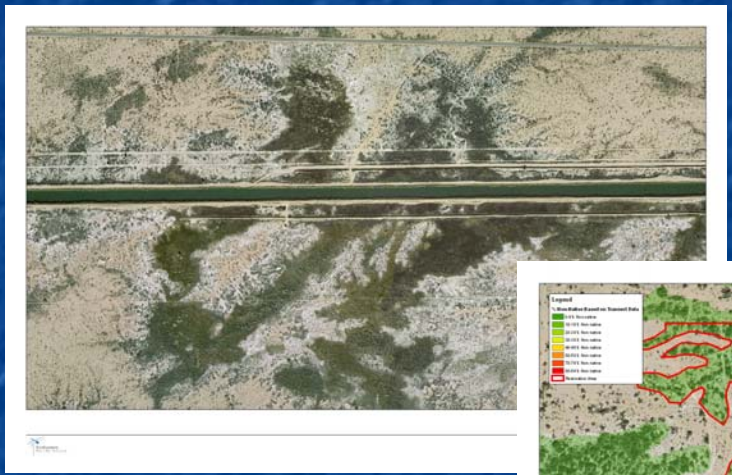
Conclusion

- 1) a comprehensive understanding of the environment



- 2) a strategic plan to accomplish implementation

- 3) monitoring & adaptive management

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Acknowledgements

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Thank You

“Sentiment without action is the ruin of the soul”

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