



Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Laguna Division Conservation Area

Project Update for the Colorado River Terrestrial and Riparian Meeting

Laughlin, NV
January 29, 2013



Fred Phillips Consulting



Natural
Channel
Design, Inc.

Nick Schultz
Bureau of Reclamation
Boulder City, NV



Presentation Outline

Balancing Resource Use and Conservation

- The Team
- Project Site Map
- Objectives and Design Considerations
- Water Accounting
- Status Update
- Construction and Planting Plans
- Re-vegetation and Habitat
- Maintenance and Monitoring

The Laguna Project Team

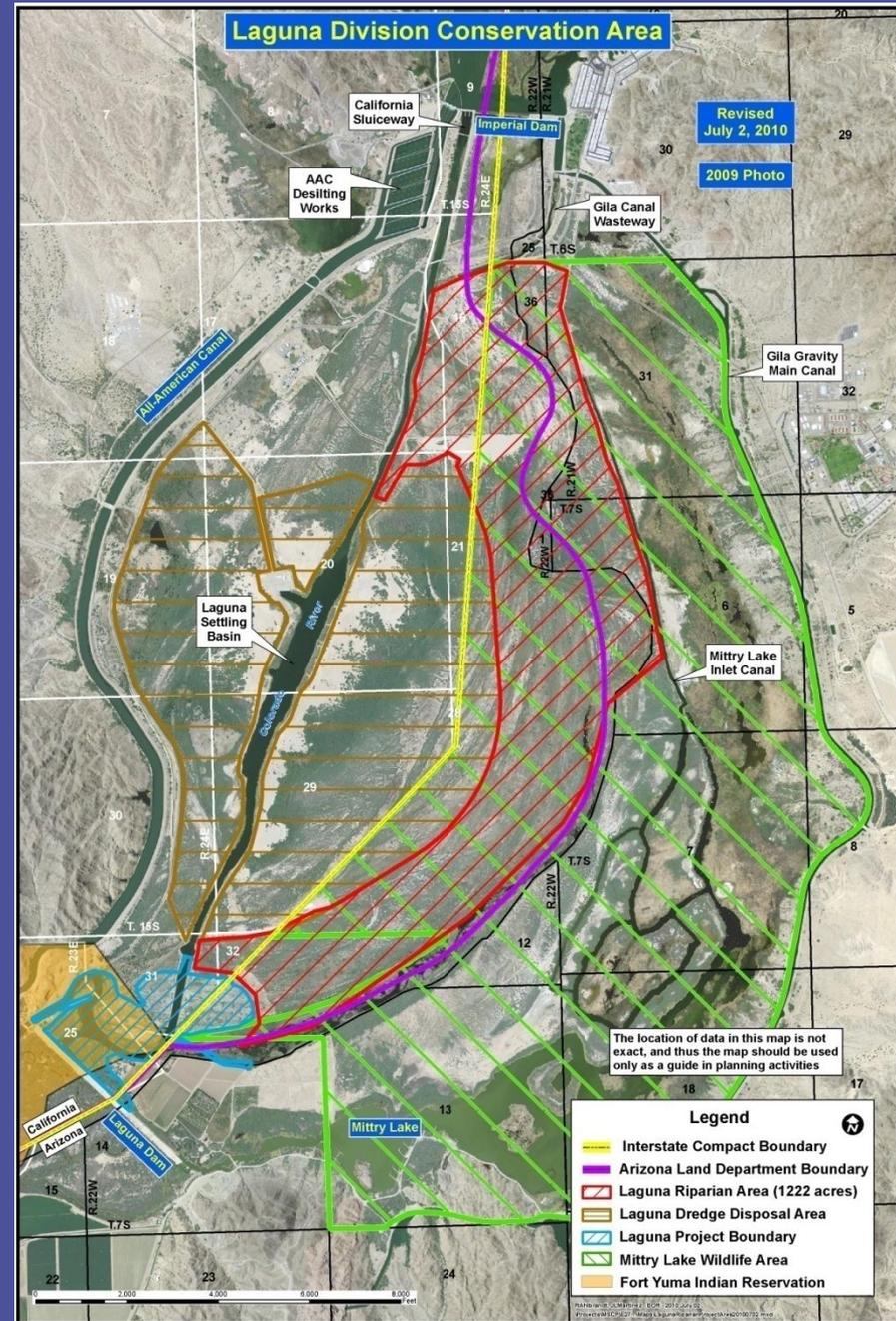
Balancing Resource Use and Conservation

- **Provo Area Office**
 - Earthwork, Construction, Planting, Design Support
- **Yuma Area Office**
 - Modeling, Earthwork/Design Support
- **Natural Channel Design**
 - Engineering and Design
- **Fred Phillips Consulting**
 - Planting Design and Weed Maintenance
- **Bureau of Land Management**
 - Access control, law enforcement



Project Site Map

- Project Area – 1200+ acres
- Reach Length – 4.3 miles
- Existing Conditions
 - Reach 1 completely cleared
 - Reach 2 clearing underway



Legend	
	Interstate Compact Boundary
	Arizona Land Department Boundary
	Laguna Riparian Area (1222 acres)
	Laguna Dredge Disposal Area
	Laguna Project Boundary
	Mitrly Lake Wildlife Area
	Fort Yuma Indian Reservation



Project Design Considerations

Balancing Resource Use and Conservation

- Up to 100 cfs available for project use
- Habitat Targets:
 - Open Water/Marsh: 50 – 100 ac
 - Cottonwood/Willow: >200 ac
 - Upland(mesquite): <500 ac
 - Include specific habitat for T&E species
- Provide hydrology to support habitats for 50 years or more
- No detrimental effect on existing Mittry Lake or Old River Channel Habitats
- Minimize impacts to existing operations (sluicing, dredge disposal, water delivery, etc.)
- Minimize both initial construction and long-term operating costs

Target Habitats



Open Water/Marsh: 50 – 100 ac



Cottonwood/Willow: >200 ac



Upland (Mesquite): <500 ac

Target Species



California Black Rail

Yuma Clapper Rail



Southwestern Willow Flycatcher



Yellow Billed Cuckoo



Yuma Hispid Cotton Rat



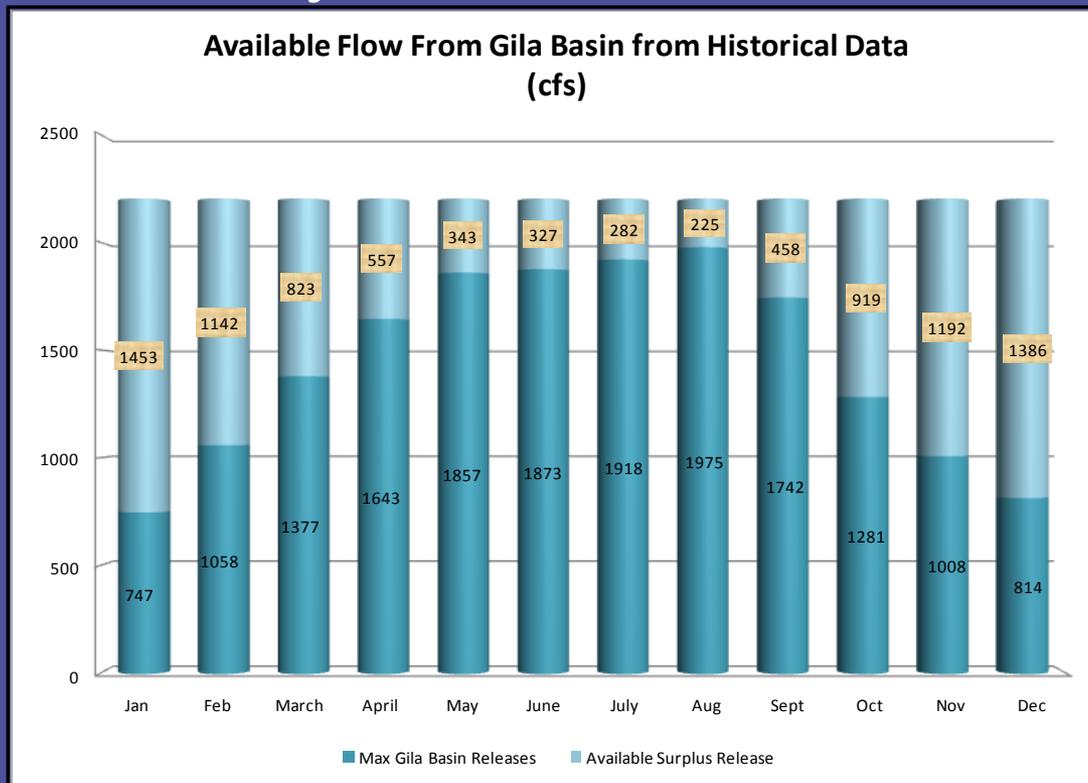
Western Least Bittern



Water Accounting

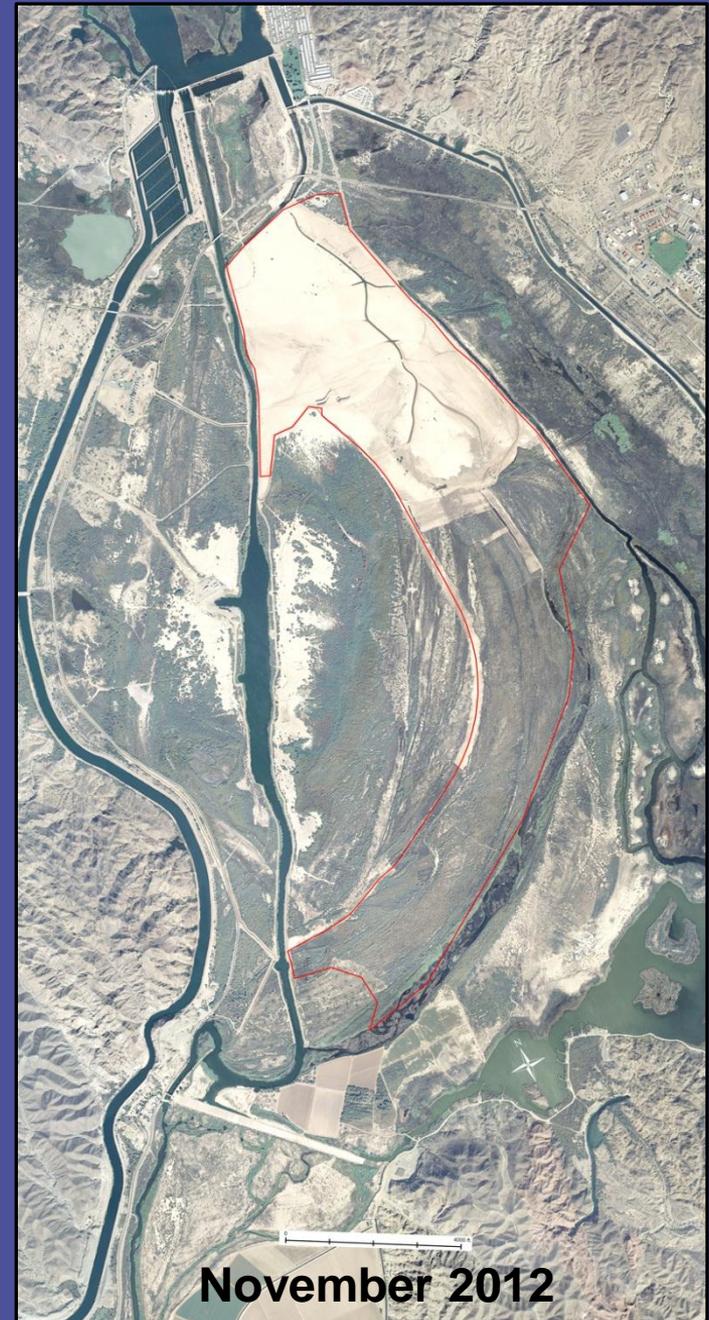
100 cfs continuous flow is available from the Gila Settling Basin

- Looking at historical (1943 – 2009) monthly flow data of gauging station, USGS 0952250 Gila Gravity Main Canal at Imperial Dam, collected in the Main Canal.
- In the event of a water shortage to the Gila Main Canal, the Laguna Division Conservation Area has lower priority than downstream users and water supply to the Area may be limited.



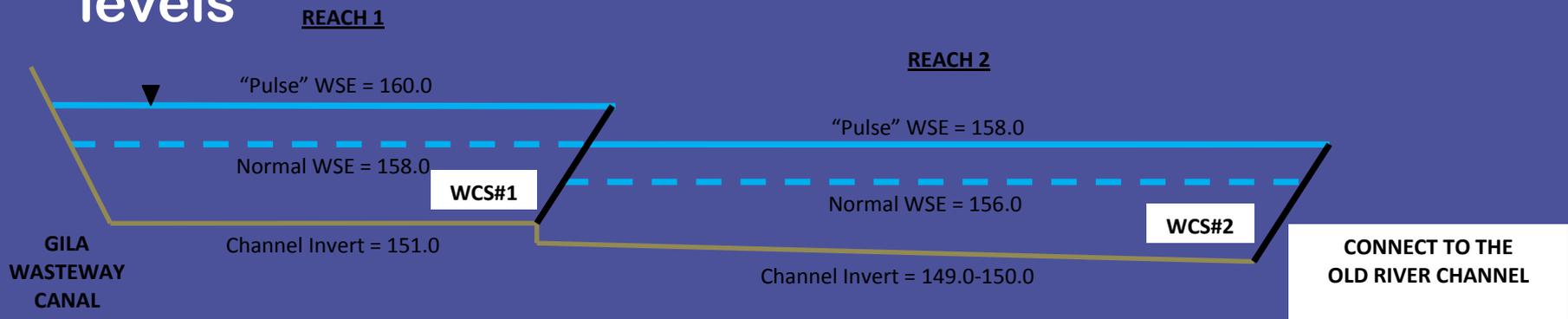
General Project Update

- Clearing underway – will be completed by Fall 2013
- Construction of water control structures ongoing through May 2013
- First planting sequence will begin late Summer 2013
- Expect project completion by Summer 2015



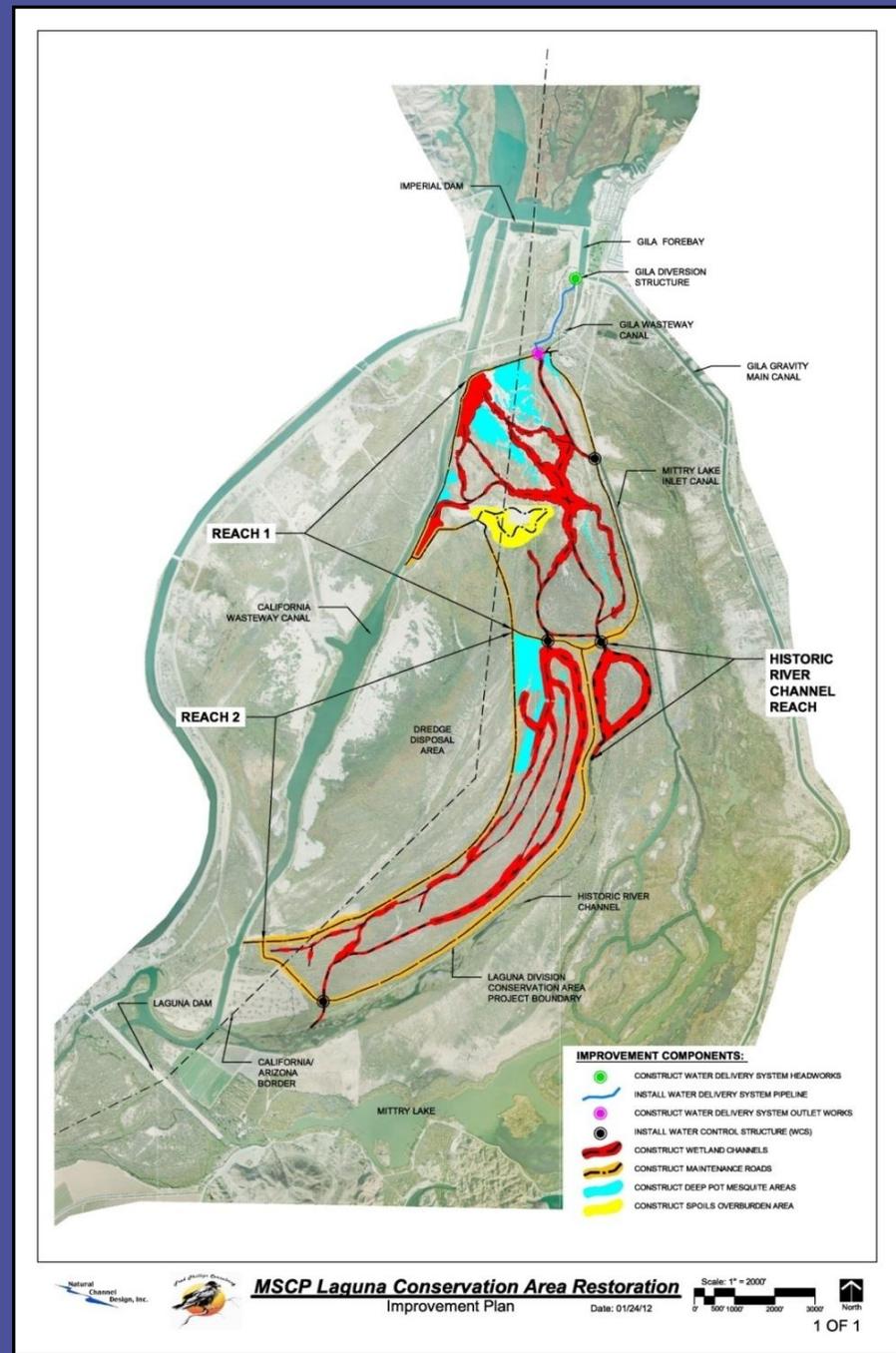
Current Construction Plan: Overview

- Operate as a managed, riverine system to maximize limited water resource
- Use existing overflow channels through project area to minimize excavation
- Use “pulse flows” to provide irrigation to woody species
- Requires water control structures to manage water levels



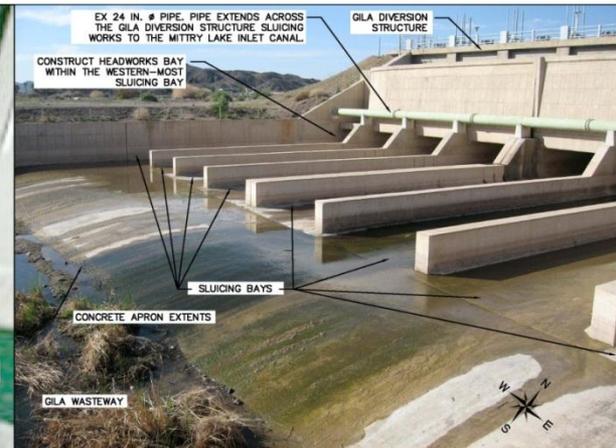
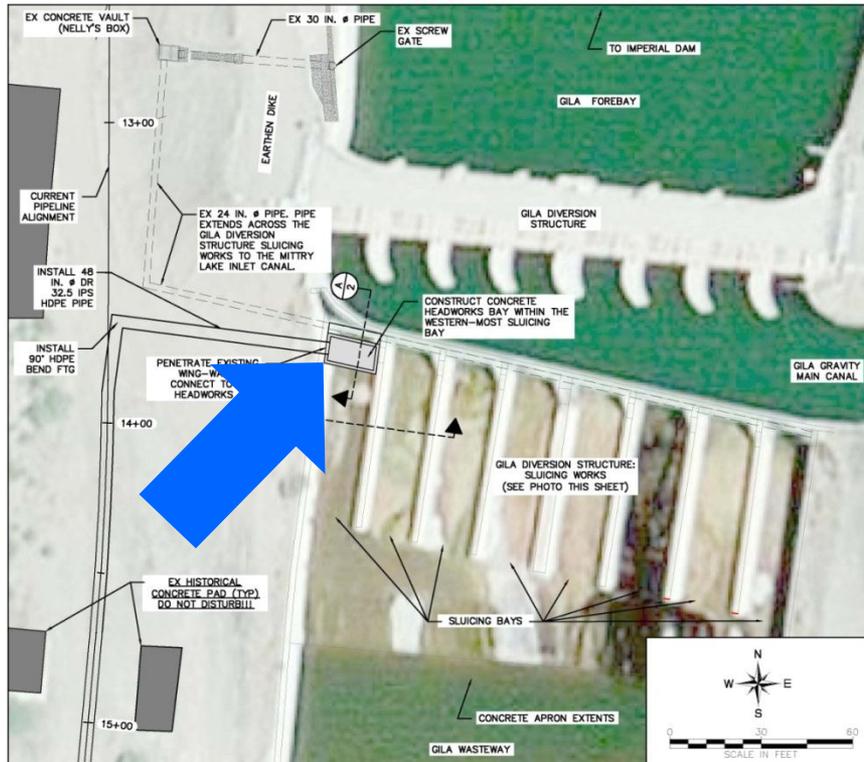
Construction Components

- Water Delivery System from Gila Forebay
 - Headworks & Pipeline
- Site Preparation for Earthwork
 - Clearing/Grubbing of Salt Cedar
- Earthwork
 - Channels support water conveyance and vegetation/habitat
 - Minimize cut/fill and maximize pulse flow irrigated area
 - Reach 1 & 2 primary and secondary channels
 - Roads roads for access and firebreaks
- Water Control Structures
 - Manage water levels in Reaches 1 & 2, and historic river channel
 - Additional Mittry Lake turnout structure



Water Delivery System: Headworks

Balancing Resource Use and Conservation



CONCEPT DESCRIPTION

- CONSTRUCT A CONCRETE HEADWORKS BAY, AS PART OF THE LAGUNA WATER DELIVERY SYSTEM, WITHIN THE WESTERN-MOST SLUICING BAY OF THE GILA DIVERSION STRUCTURE SLUICING WORKS. THE HEADWORKS WOULD BE DIRECTLY INTEGRATED WITH AND WOULD ACT AS AN EXTENSION OF THE EXISTING SLUICE GATE PORT.
- THE EXISTING SLUICE GATE WOULD BE OPENED TO ALLOW WATER TO ENTER THE HEADWORKS BAY, WHERE THE WATER WOULD THEN PASS INTO THE INLET OF THE WATER DELIVERY SYSTEM PIPELINE.
- WHEN SLUICING IS REQUIRED, THE NEW SLUICE GATE TO THE WATER DELIVERY PIPELINE WOULD BE CLOSED AND SLUICING EVENTS WOULD BE ROUTED THROUGH THE HEADWORKS BAY VIA TWO, NEW SLUICE GATES WITHIN THE HEADWORKS BAY.
- WHEN LONG-TERM MAINTENANCE AND/OR INSPECTION IS REQUIRED WITHIN THE HEADWORKS BAY, THE EXISTING SLUICE GATE COULD BE CLOSED.

ADVANTAGES OVER PREVIOUS CONCEPT

- THE HEADWORKS BAY CAN BE CONSTRUCTED COMPLETELY IN THE DRY AND CONSTRUCTION WILL NOT IMPACT OPERATIONS OF THE GILA MAIN CANAL (I.E. NO DRAW-DOWN REQUIRED).
- THE CONCEPT USES EXISTING INFRASTRUCTURE (GATES, SLUICE PORTS, ETC.) AND DOES NOT REQUIRE BREACHING THE WATER WORKS (I.E. NO CONCRETE OR DIKE BREACHING).
- REDUCES PIPE LENGTH BY 275 FEET AND ELIMINATES THE NEED FOR A MANHOLE AND FILTER DIAPHRAGM

ALTERNATIVE HEADWORKS CONCEPT:
PLAN VIEW & NARRATIVE

LAGUNA DIVISION CONSERVATION AREA
WATER DELIVERY SYSTEM PROJECT:
HEADWORKS & OUTLET WORKS PLAN



DRAWN BY: G. CATHEY
DESIGNED BY: G. CATHEY
REVIEWED BY:

REV	DATE	BY	REVISION

**PRELIMINARY
NOT FOR
CONSTRUCTION**

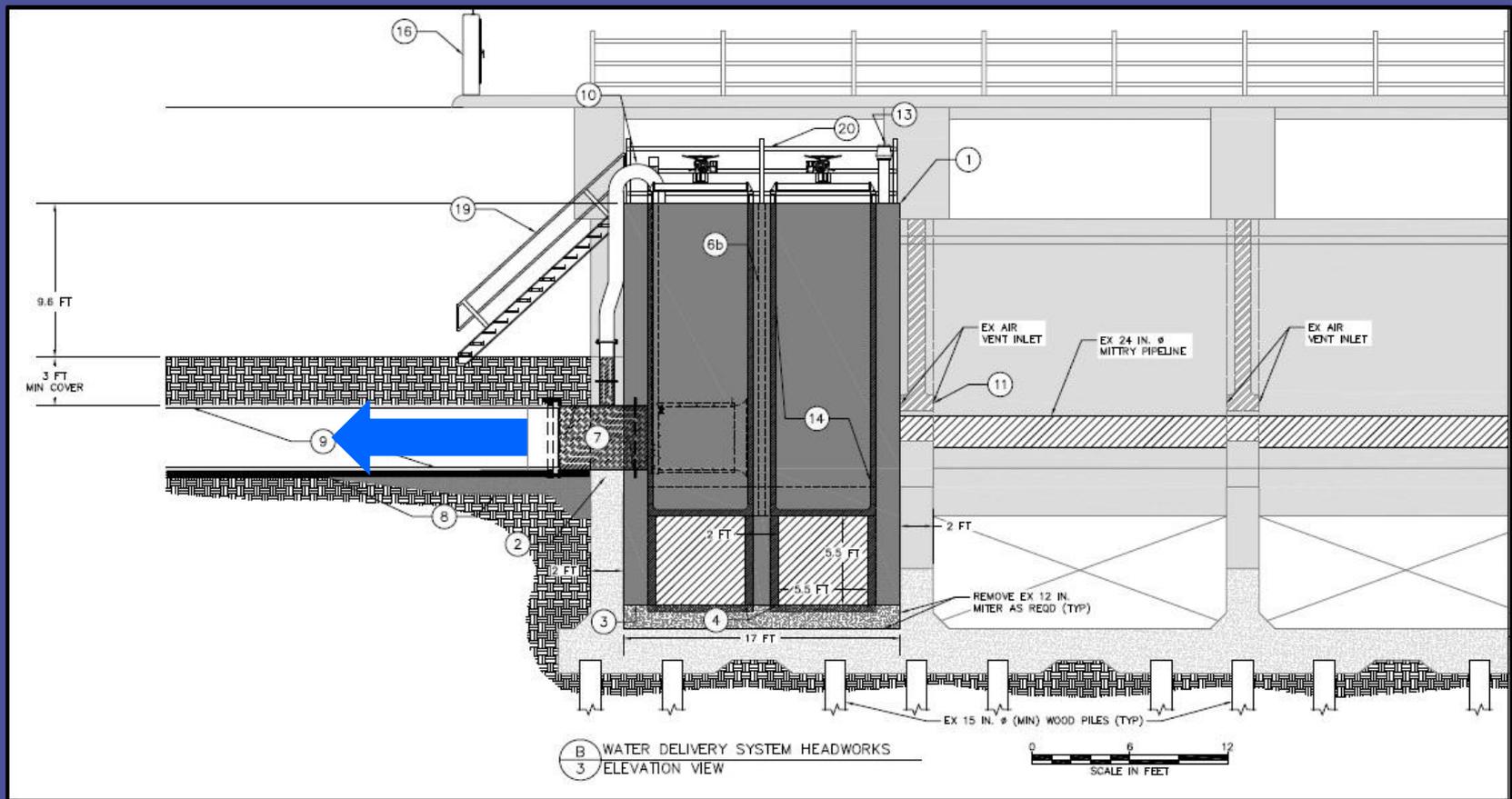
UNAUTHORIZED CHANGES & USES
THE ENGINEER PREPARING THESE PLANS
WILL NOT BE RESPONSIBLE FOR, OR
Liable FOR, UNAUTHORIZED CHANGES TO
OR USES OF THESE PLANS. ALL
CHANGES MUST BE IN WRITING AND
MUST BE APPROVED BY THE PREPARER
OF THESE PLANS.

DATE: 10-05-11
NCD PROJECT NO: 09-164-AZ

DRAWING NO: EX01
SHEET NO: 1 OF 2

Water Delivery System: Headworks

Balancing Resource Use and Conservation



Water Delivery System: Pipeline

Balancing Resource Use and Conservation

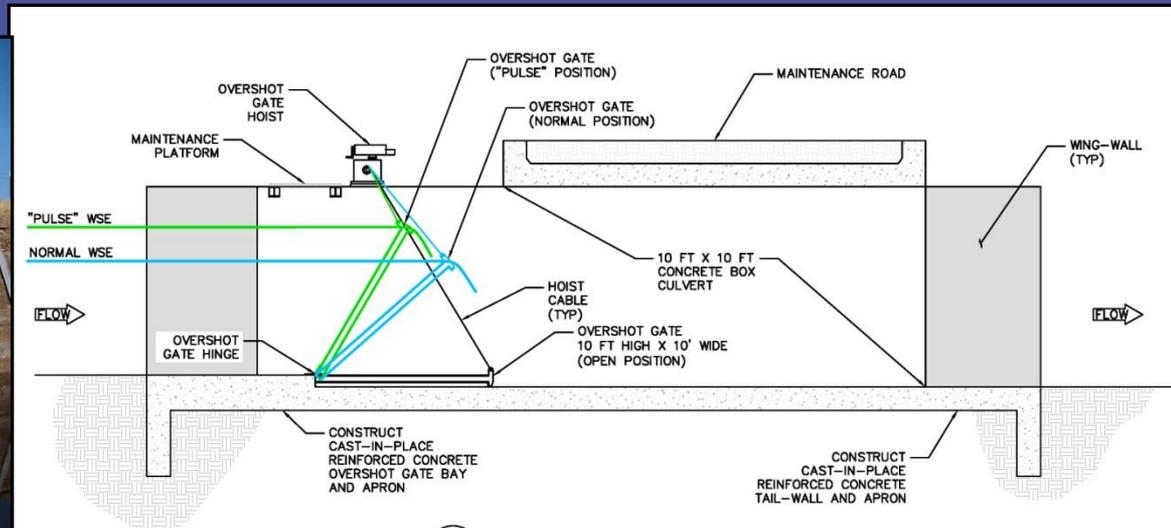
- 48-inch diameter, 4,000 Foot pipeline
 - Inverted siphon to cross underneath the Gila Wasteway Canal
 - Construction Completed in Spring 2012



Water Control Structures

Balancing Resource Use and Conservation

- Overshot Gates set in cast-in-place concrete bays
- Constructed in concert with earthwork operations
- Fully-automated
- Additional Mittry Lake turn-out structure



Earthwork Operations

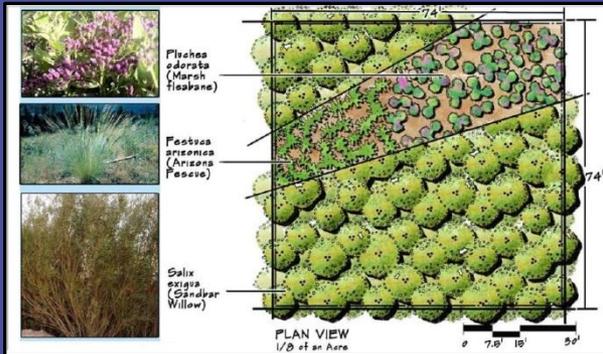
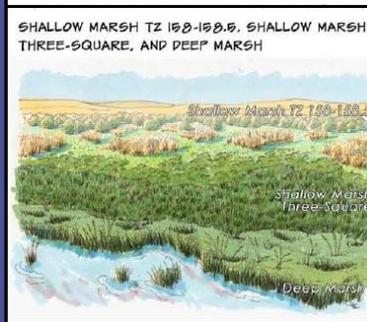
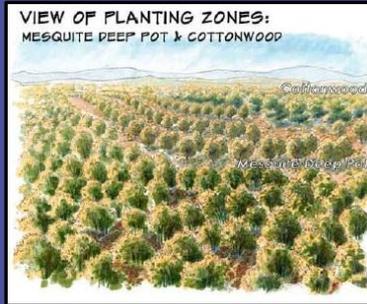
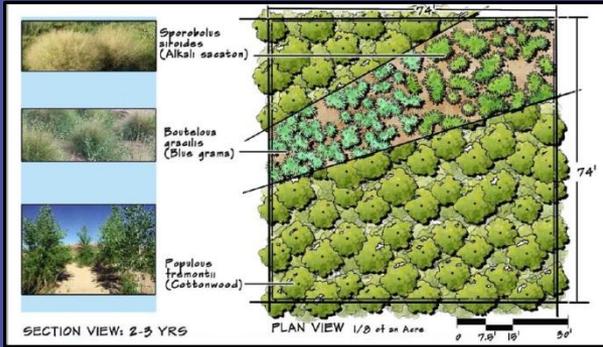
- Earthwork *Balancing Resource Use and Conservation*
 - Roughly 2 Million Cubic Yards of excavation
 - Utilize excavated spoils to form levees and maintenance roads
 - Began Fall 2011
 - Scheduled completion in Fall 2013
- Invasive weed management on-going



Site Preparation for Planting



Proposed Planting Plan



Legend

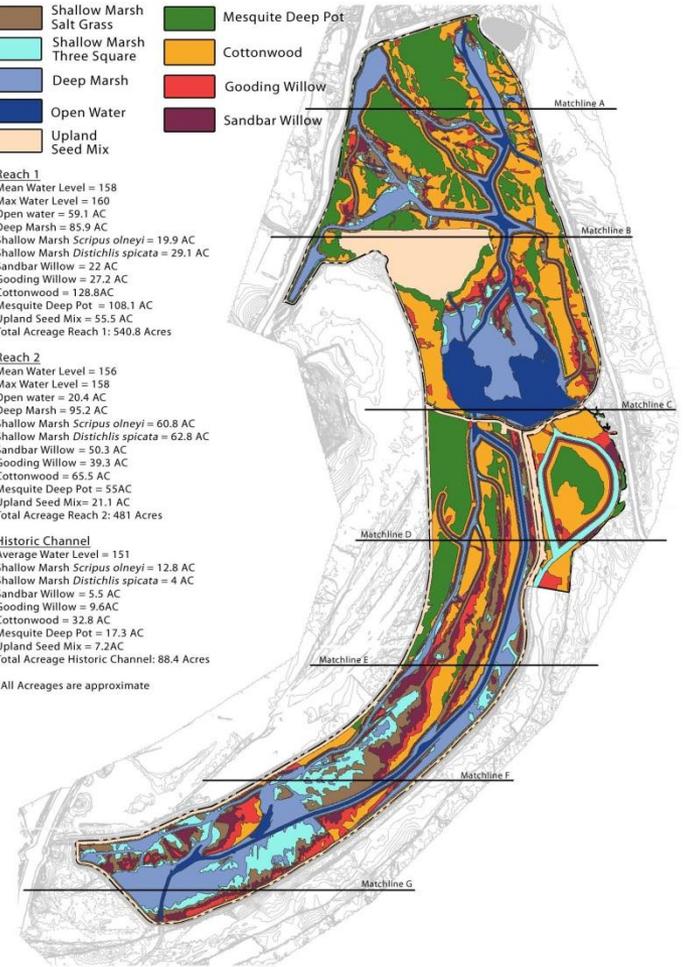
- | | | | |
|--|----------------------------|--|-------------------|
| | Shallow Marsh Salt Grass | | Mesquite Deep Pot |
| | Shallow Marsh Three Square | | Cottonwood |
| | Deep Marsh | | Gooding Willow |
| | Open Water | | Sandbar Willow |
| | Upland Seed Mix | | |

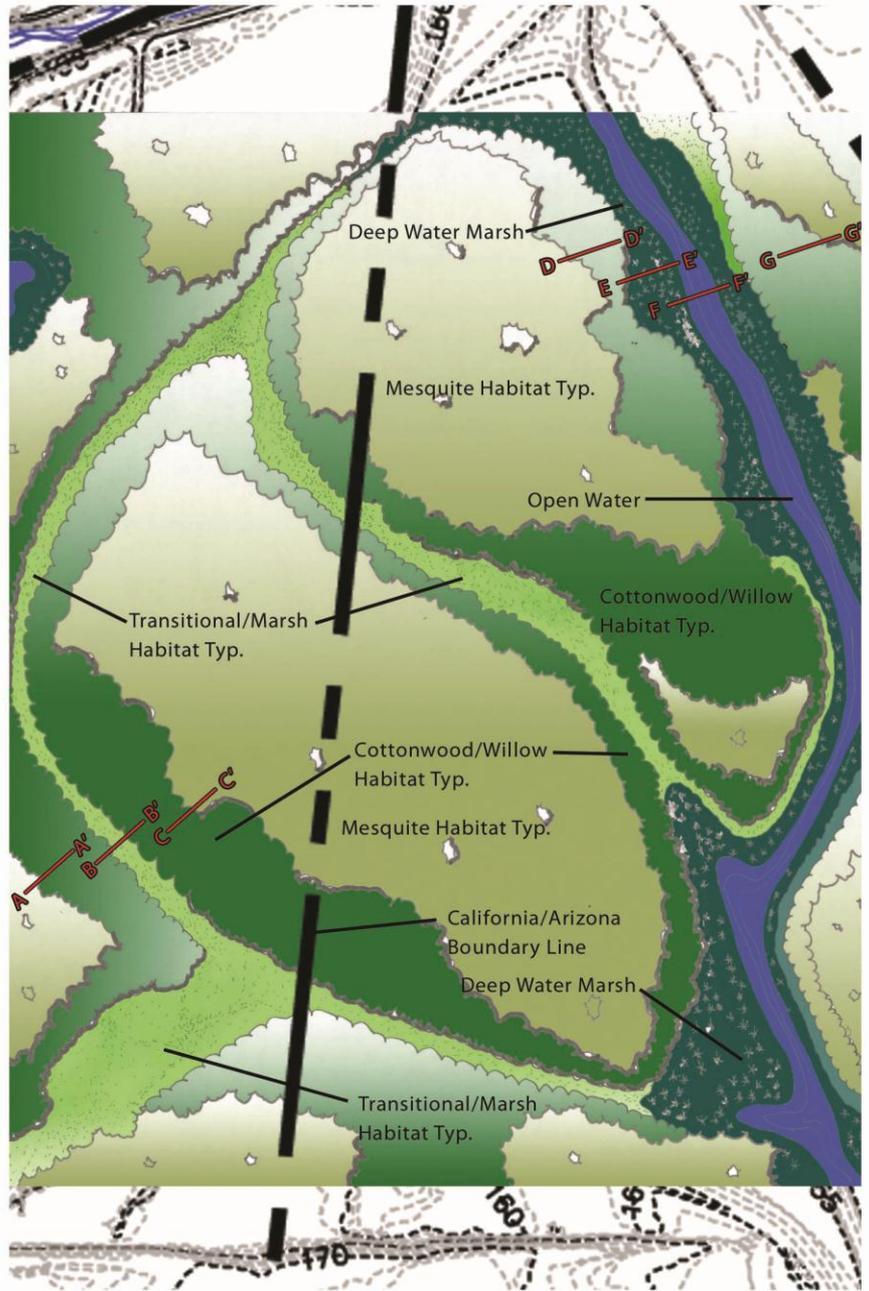
Reach 1
 Mean Water Level = 158
 Max Water Level = 160
 Open water = 59.1 AC
 Deep Marsh = 85.9 AC
 Shallow Marsh *Scripus olneyi* = 19.9 AC
 Shallow Marsh *Distichlis spicata* = 29.1 AC
 Sandbar Willow = 22 AC
 Gooding Willow = 27.2 AC
 Cottonwood = 128.8 AC
 Mesquite Deep Pot = 108.1 AC
 Upland Seed Mix = 55.5 AC
 Total Acreage Reach 1: 540.8 Acres

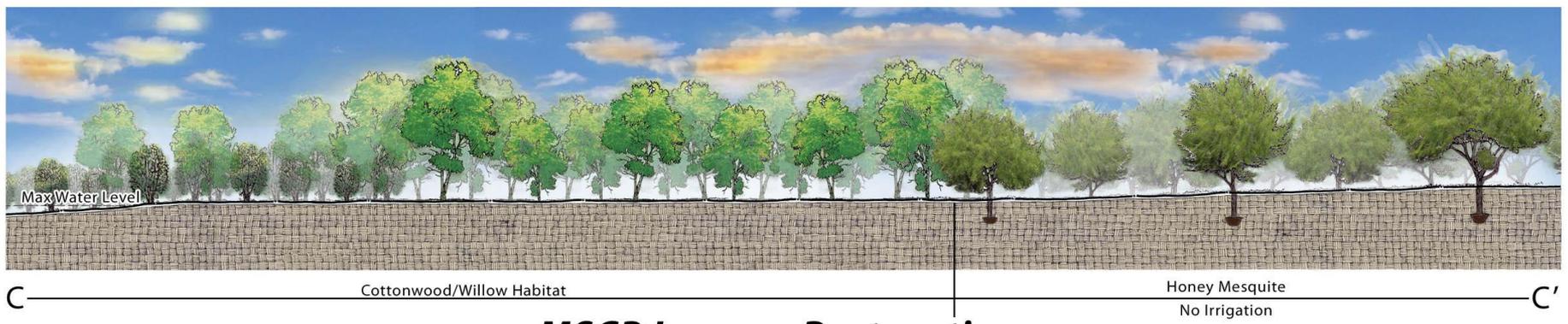
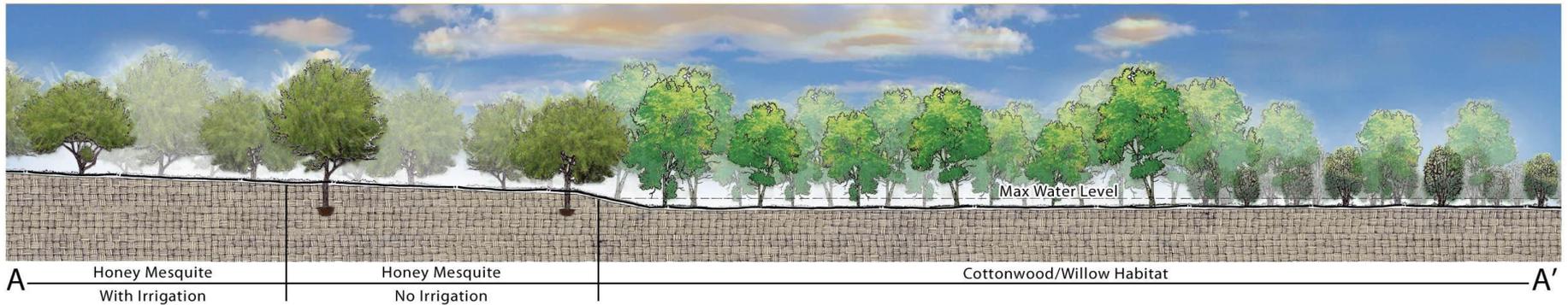
Reach 2
 Mean Water Level = 156
 Max Water Level = 158
 Open water = 20.4 AC
 Deep Marsh = 95.2 AC
 Shallow Marsh *Scripus olneyi* = 60.8 AC
 Shallow Marsh *Distichlis spicata* = 62.8 AC
 Sandbar Willow = 50.3 AC
 Gooding Willow = 39.3 AC
 Cottonwood = 65.5 AC
 Mesquite Deep Pot = 55 AC
 Upland Seed Mix = 21.1 AC
 Total Acreage Reach 2: 481 Acres

Historic Channel
 Average Water Level = 151
 Shallow Marsh *Scripus olneyi* = 12.8 AC
 Shallow Marsh *Distichlis spicata* = 4 AC
 Sandbar Willow = 5.5 AC
 Gooding Willow = 9.5 AC
 Cottonwood = 32.8 AC
 Mesquite Deep Pot = 17.3 AC
 Upland Seed Mix = 7.2 AC
 Total Acreage Historic Channel: 88.4 Acres

*All Acreages are approximate







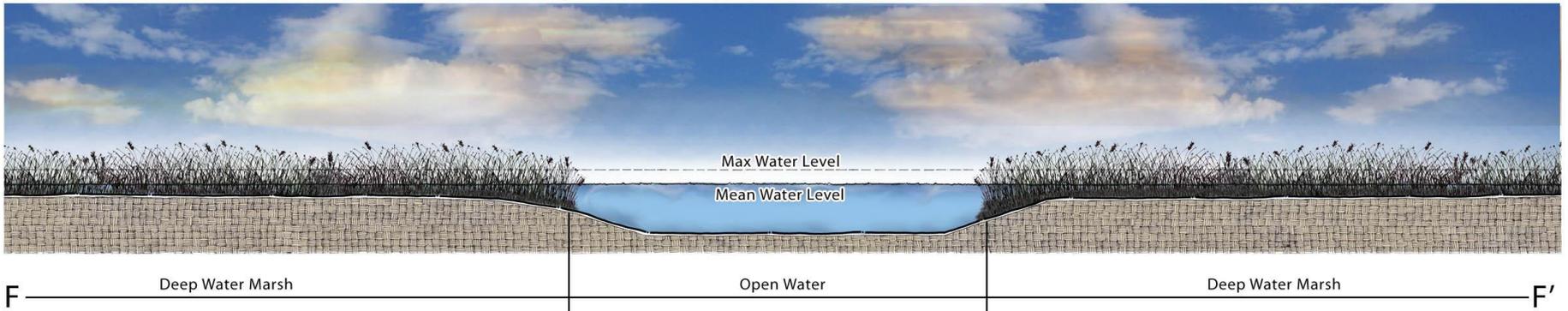
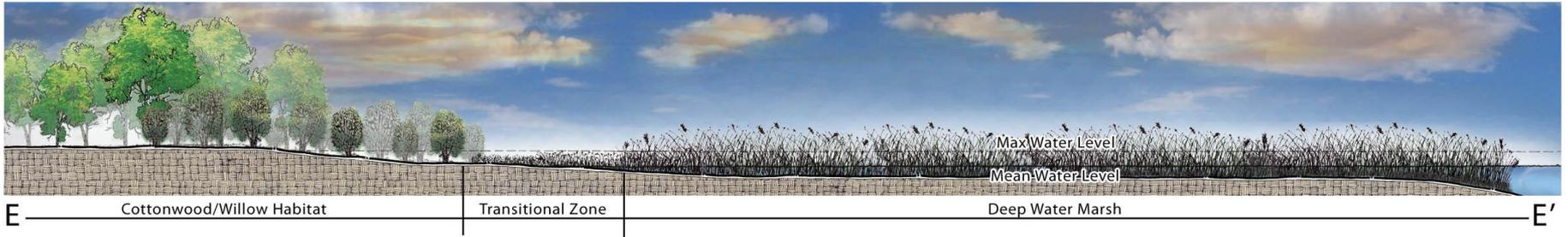
MSCP Laguna Restoration

Reach 1 Cross Sections

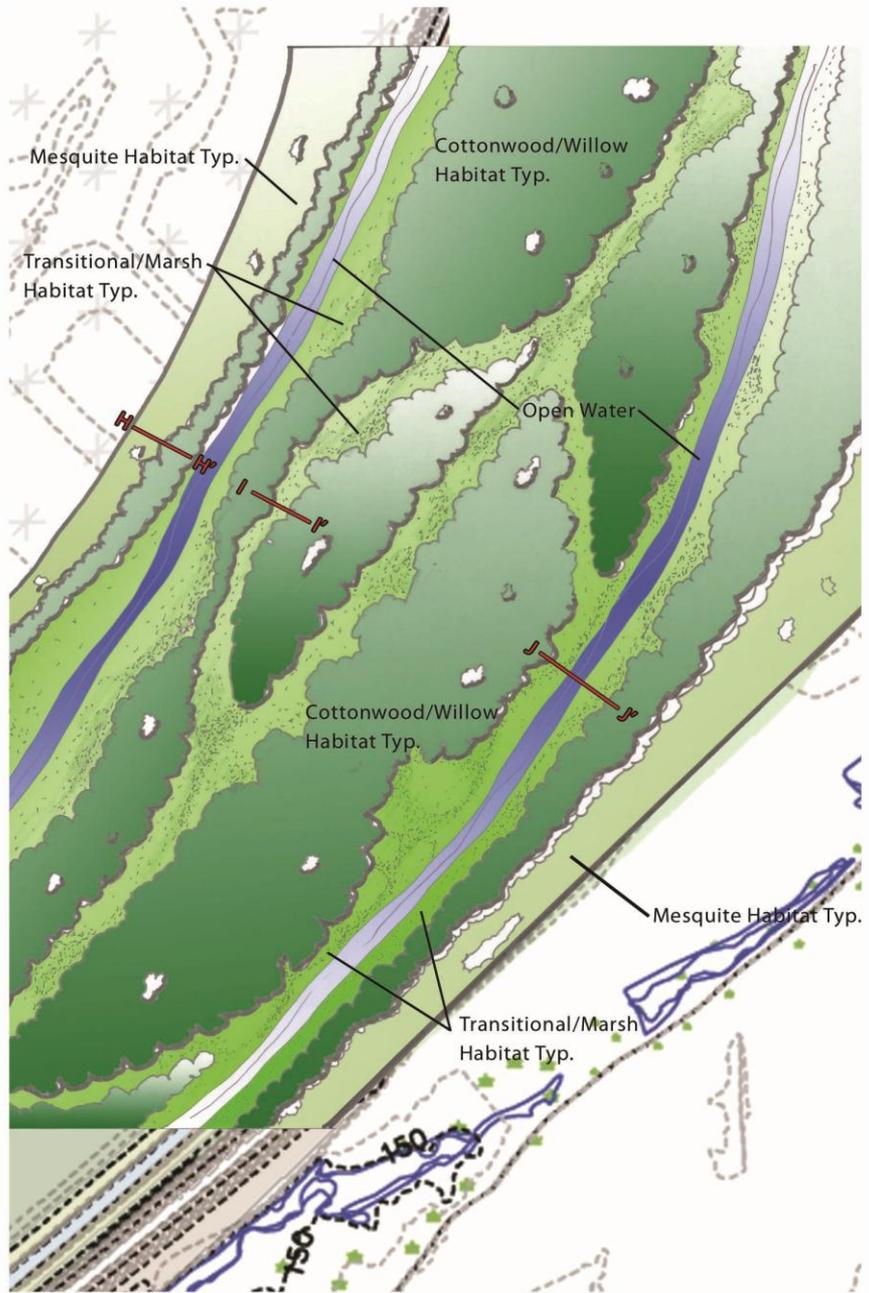


Date: 8/25/10

Scale: 1" = 120'

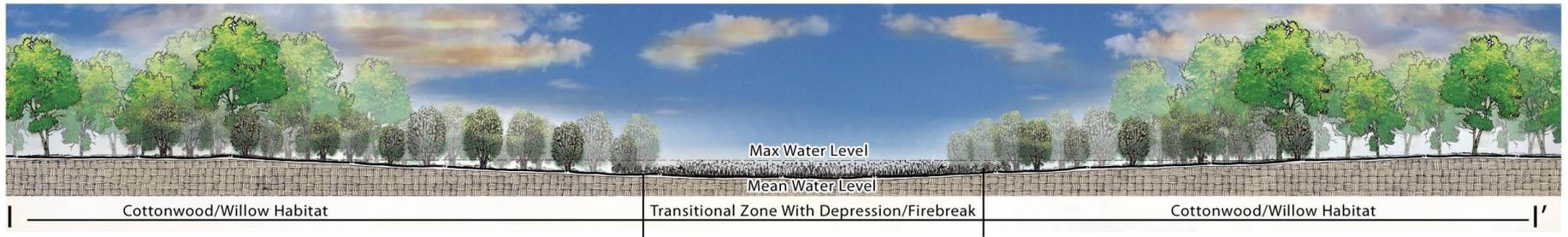


MSCP Laguna Restoration
Reach 1 Cross Sections

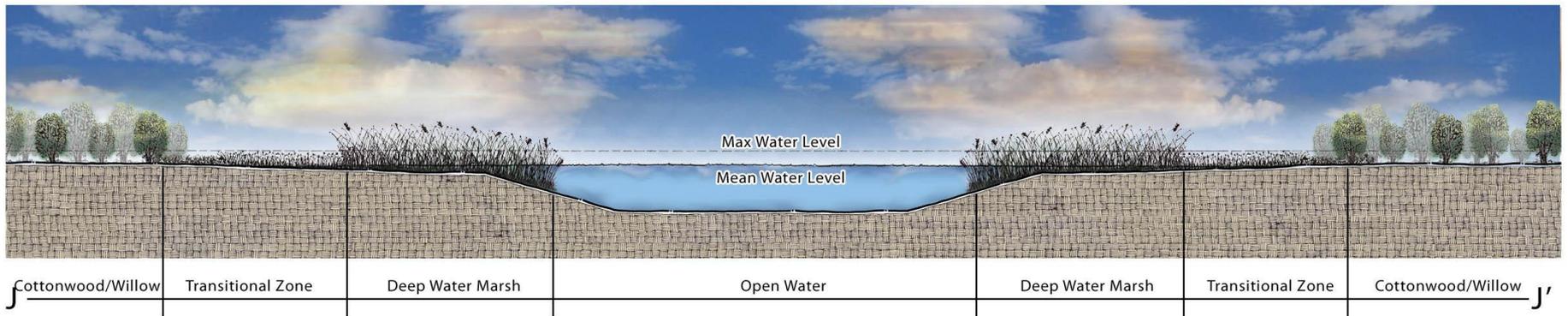




H Honey Mesquite With Irrigation | Honey Mesquite No Irrigation | Cottonwood/Willow Habitat H'



Cottonwood/Willow Habitat | Transitional Zone With Depression/Firebreak | Cottonwood/Willow Habitat I'



J Cottonwood/Willow | Transitional Zone | Deep Water Marsh | Open Water | Deep Water Marsh | Transitional Zone | Cottonwood/Willow J'

MSCP Laguna Restoration

Reach 2 Cross Sections



Scale: 1" = 120'

Date: 8/25/10





Plant Establishment

Balancing Resource Use and Conservation

1. Marsh and Mesquite

- Hand-planting of marsh plugs and deep pot mesquites
- Marsh plants must establish before the transitional/cottonwood areas
 - can be flooded
- Mesquites irrigated by water trucks if needed

2. Cottonwood and Willow

- Mass-planted with plugs and pole planting

3. Water level management

- Frequent fluctuations the first two years during establishment
- Once vegetation is established, maintain stable water levels

Channel Revegetation (Tidal irrigation with water control structures)



April 2006



June 2010

Marsh and Transitional Zone (Tidal irrigation with water control structures)



October 2005

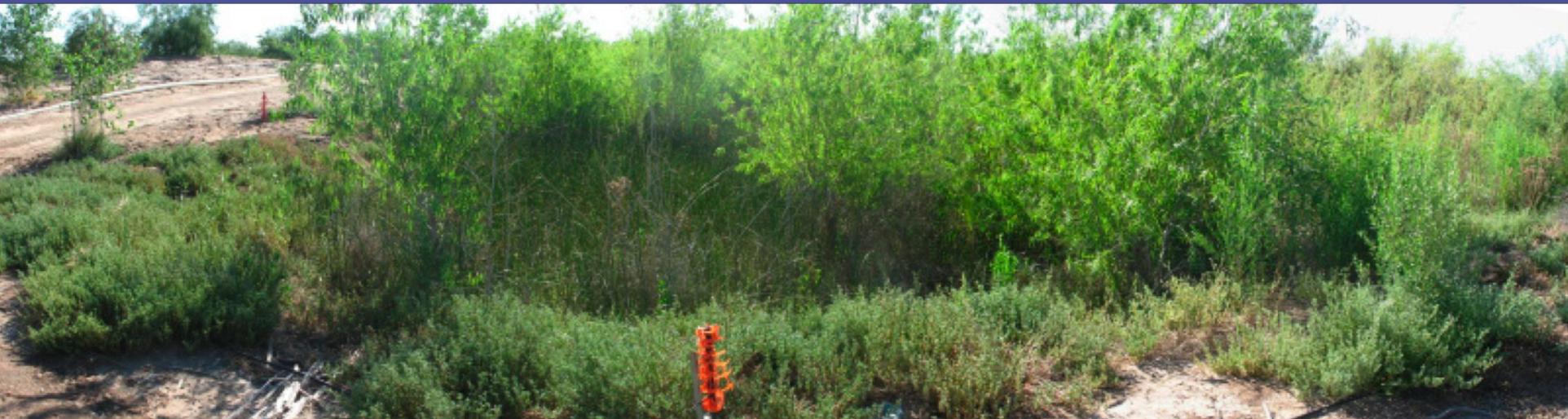


June 2010

Transitional Zone (Tidal irrigation with water control structures)



October 2006



June 2010



Project Maintenance and Monitoring

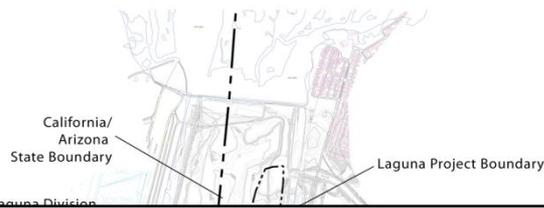
Balancing Resource Use and Conservation

- Follow-up contouring after test flooding and prior to planting
- Continued weed maintenance during plant establishment period
- Maintenance and operation of water control structures, roads and project infrastructure (50 years)
- Irrigation of upland mesquite re-vegetation
- Plant and wildlife monitoring
- Long-term weed, replanting and irrigation maintenance

LDCA Access

Legend

- Mesquite on Irrigation
- Mesquite Deep Pot
- Cottonwood
- Gooding Willow
- Sandbar Willow
- Shallow Marsh Salt Grass
- Shallow Marsh Three Square



Multi Species Conservation Program

Managing water in the west...

The following seed collecting work for the Virgin River was done by three person crew working eight hours per day over the course of Collection Site #1 in the main channel of the flood plain of the Virgin River. This site is located in the 200+ year old acequia and drainage. Seeds from stands of gooding willow *Salix goodingii* (Director of restoration project manager Tom Doolittle and Ben University). Seeds were collected directly from the trees at the branches or pruned branch branches from higher up in the tree using pruning methods as not to injure or kill the trees. To ensure collected from a multitude of stands in the area. Care was taken to collect seed heads and all seeds were bagged and labeled with cottonwood *Populus tremulus* were collected from this site were collected from site #1.

Collection Site #2 is a half mile downriver Beaver Dam Wash. On course just upstream from the wash's confluence with the N1 contained seed were collected here using the methods described above.

COLORADO RIVER CONSERVATION HABITAT

Laser Survey of a Mesa City

WELCOME TO THE LAGUNA DIVISION CONSERVATION AREA

COMMON WILDLIFE OF THE LAGUNA CONSERVATION AREA



Designed By: FFC

LAGUNA DIVISION CONSERVATION AREA

PROPOSED INTERPRETIVE SIGNS

Figure 2

Date: 7/1/11



Laguna Division Conservation Area

Proposed Access Plan

Figure 1
Date: 7/12/11





Current Schedule

Balancing Resource Use and Conservation

- Test flood Reach 1 (summer 2013)
- Plant Reach 1 marsh (fall 2013)
- Collect & plant poles in Reach 1 (Jan 2014)
- Plant mesquites in Reach 1 (Feb – Apr 2014)
- Plant riparian in Reach 1 (Feb – Apr 2014)
- Plant marsh in Reach 2 (April 2014)
- Collect & plant poles in Reach 2 (Jan 2015)
- Plant mesquites in Reach 1 (Feb – Apr 2015)
- Plant riparian in Reach 2 (Feb – Apr 2015)



Questions?

<http://www.lcrmscp.gov/conservation/laguna.html>