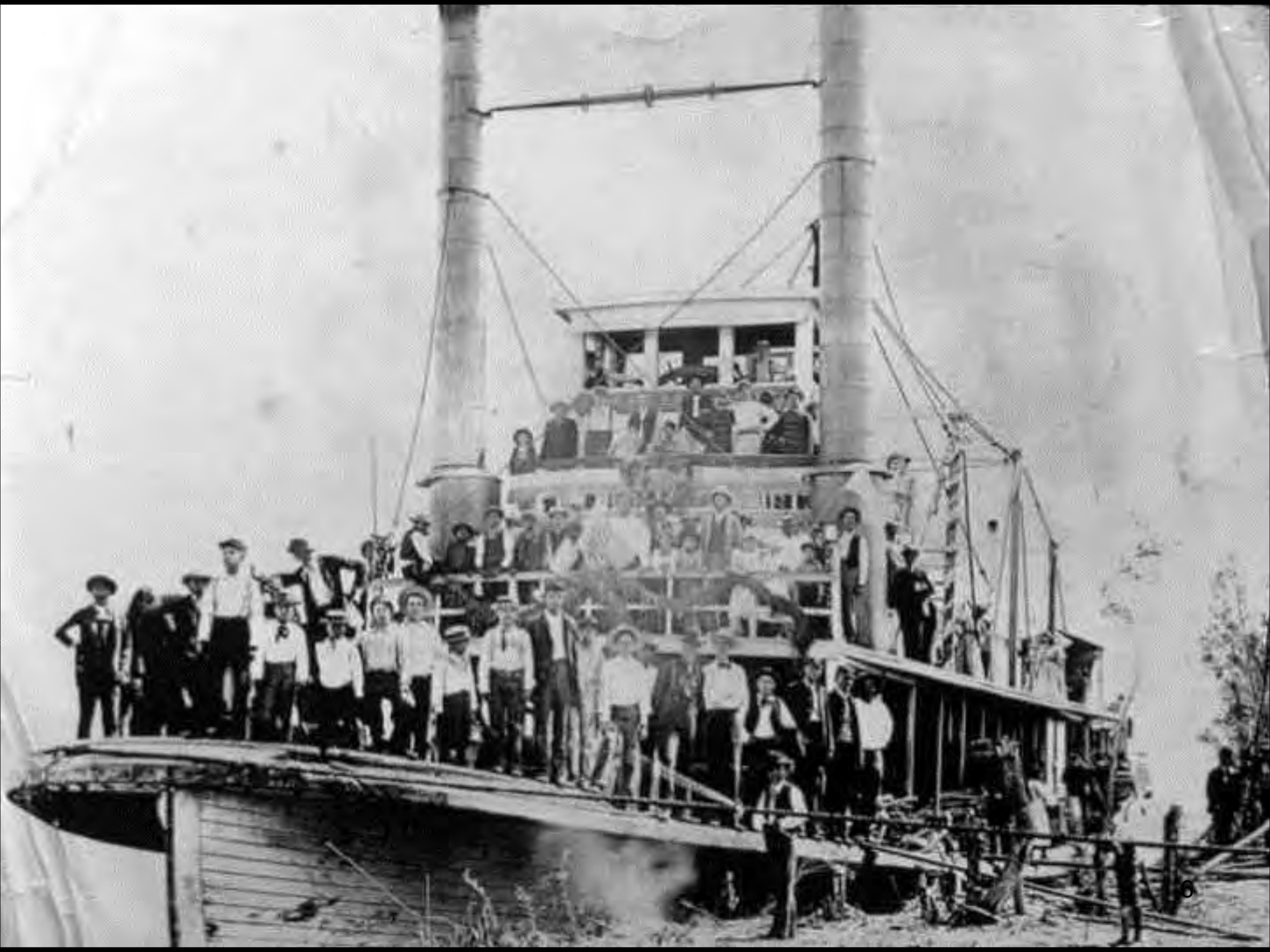
The Colorado River

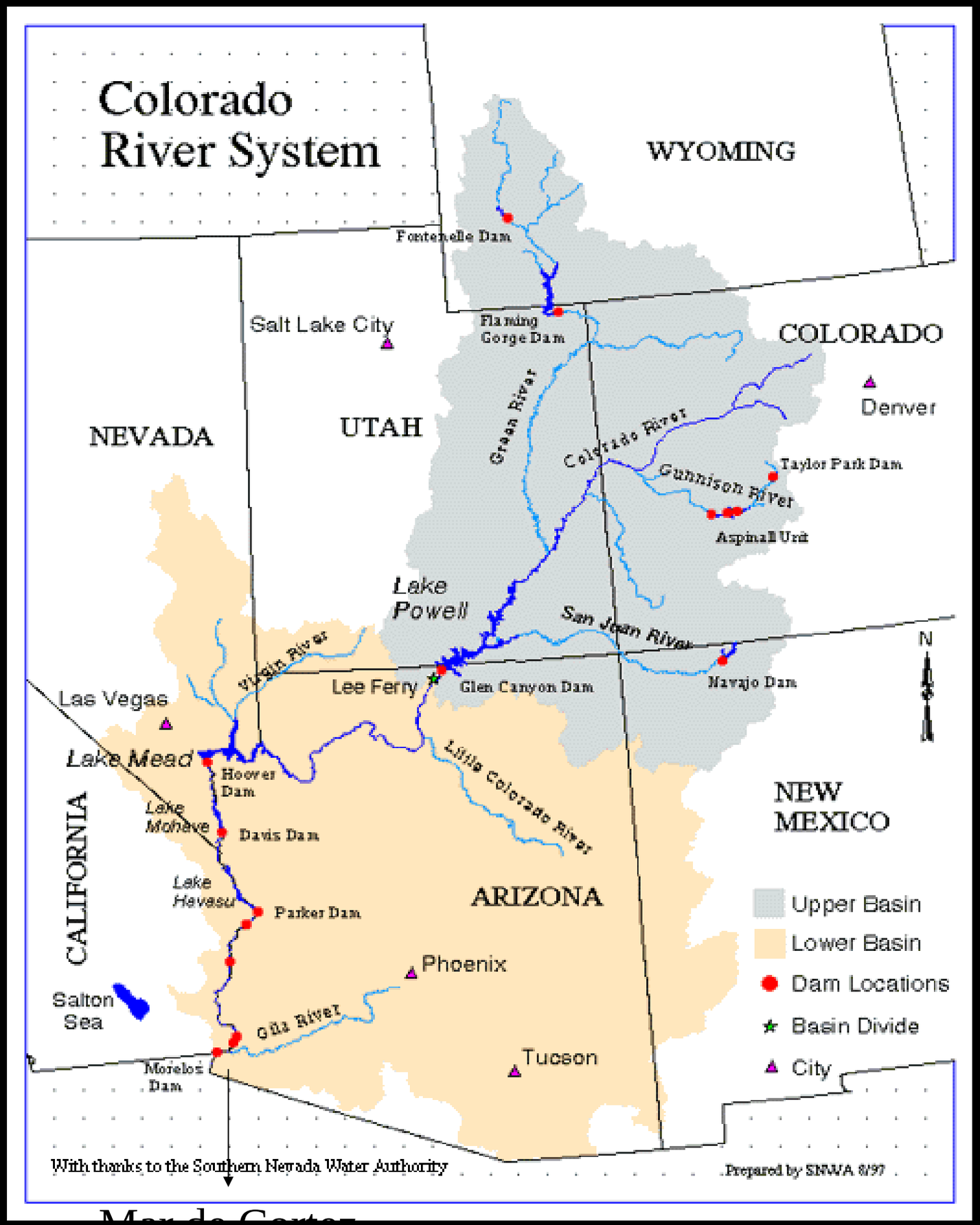
- **Riparian Areas in the Desert Southwest Make up approximately 3% of the Land Mass**

- **Riparian Areas in the Desert Southwest Support 35% of the Avifauna Species and 33% of the Plant Species**

- **90% + of the Riparian Areas have Been Destroyed in the south west**

a sample of the Geese that winter on the -
Colorado River Delta Project





Habitat Fragmentation

4 Large Dams

- **Glen Canyon**
- **Hoover**
- **Davis**
- **Parker**

5 Smaller Weirs

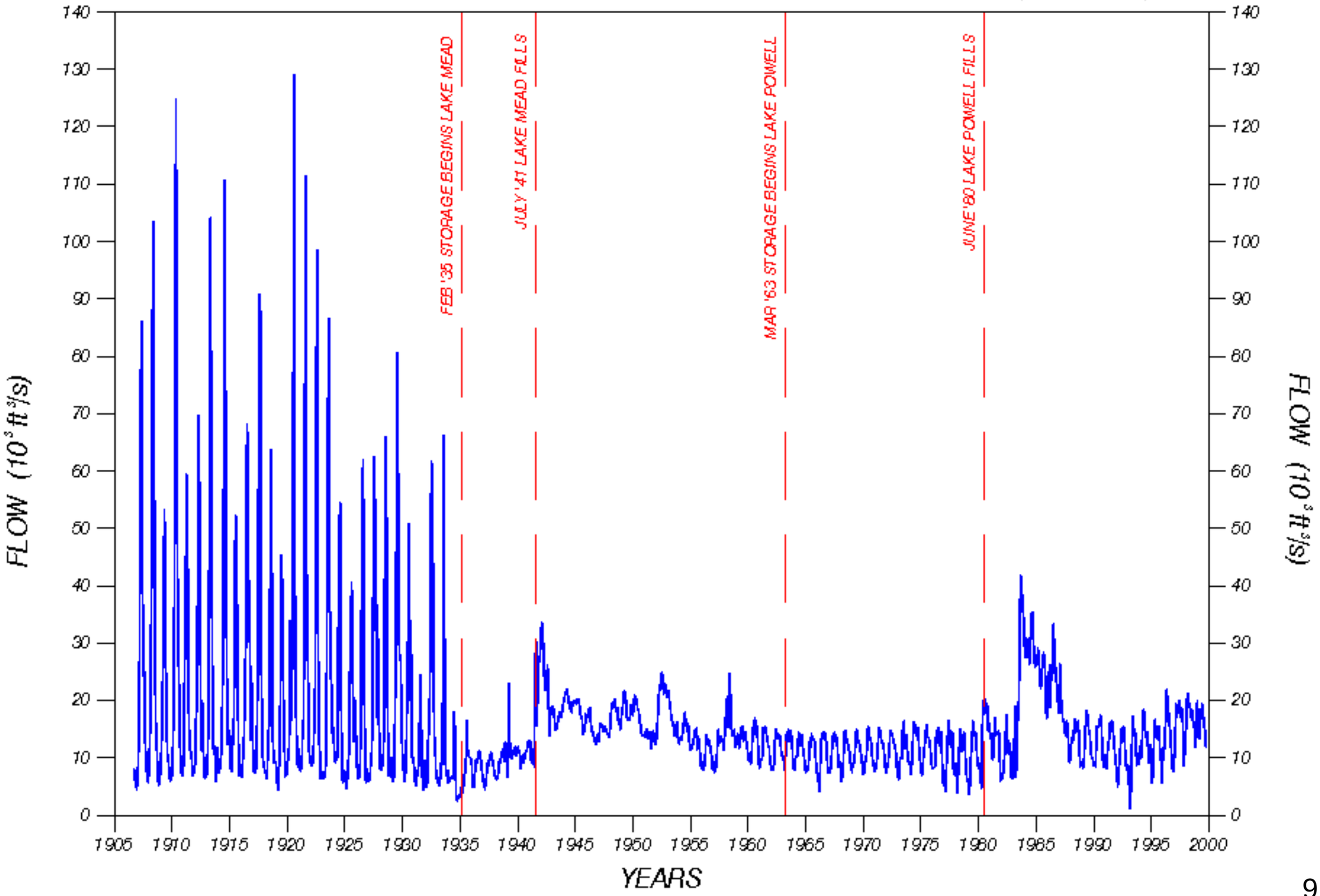
- **Headgate Rock**
- **Palo Verde Weir**
- **Imperial Dam**
- **Laguna Dam**
- **Morelos Dam**

Imperial Dam & Desilting Works
C423-300-020000

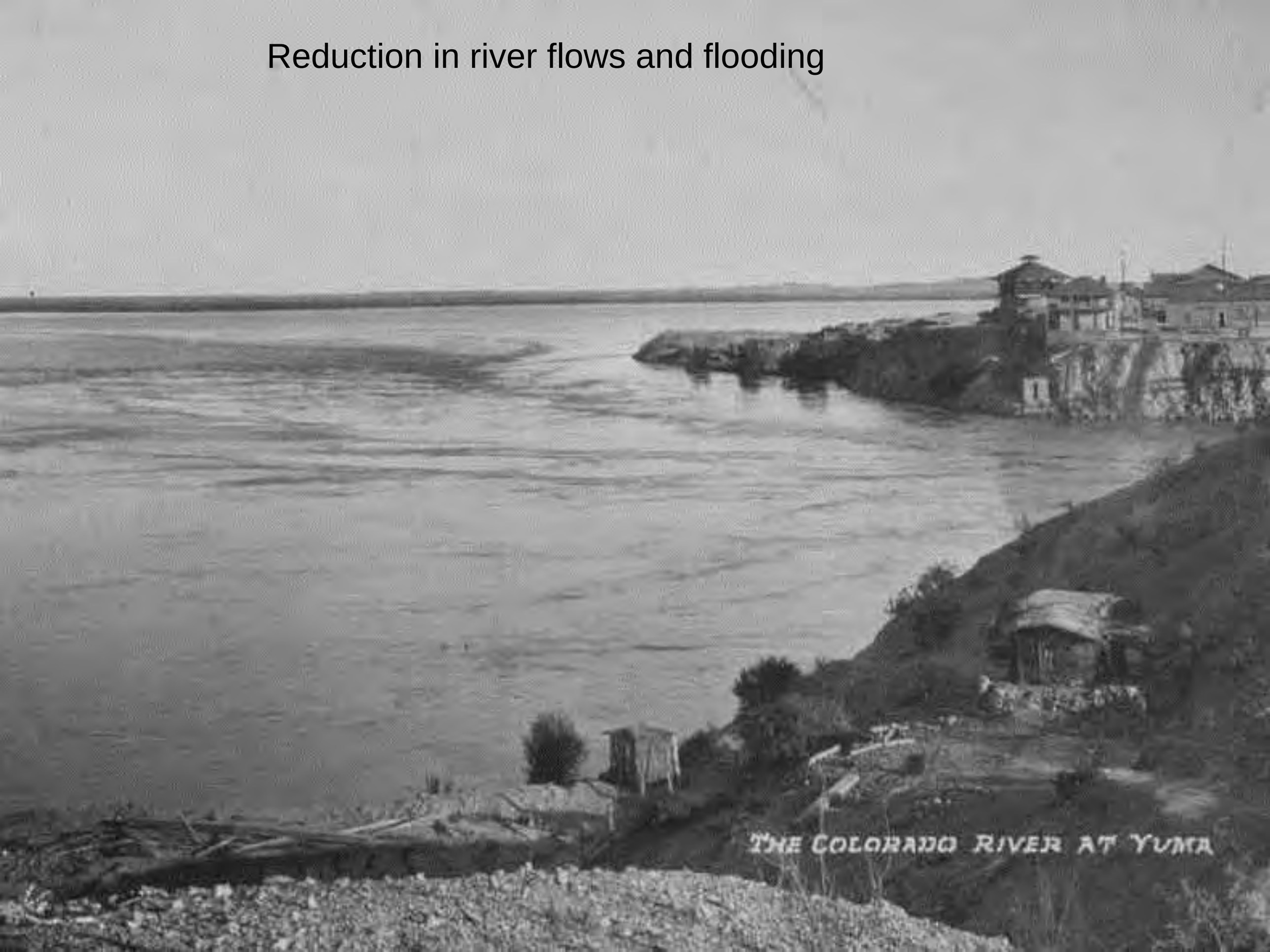
FLOW BELOW HOOVER DAM

1906 THROUGH SEPTEMBER 1999

(UNITS: ENGLISH)



Reduction in river flows and flooding

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ENGLAND

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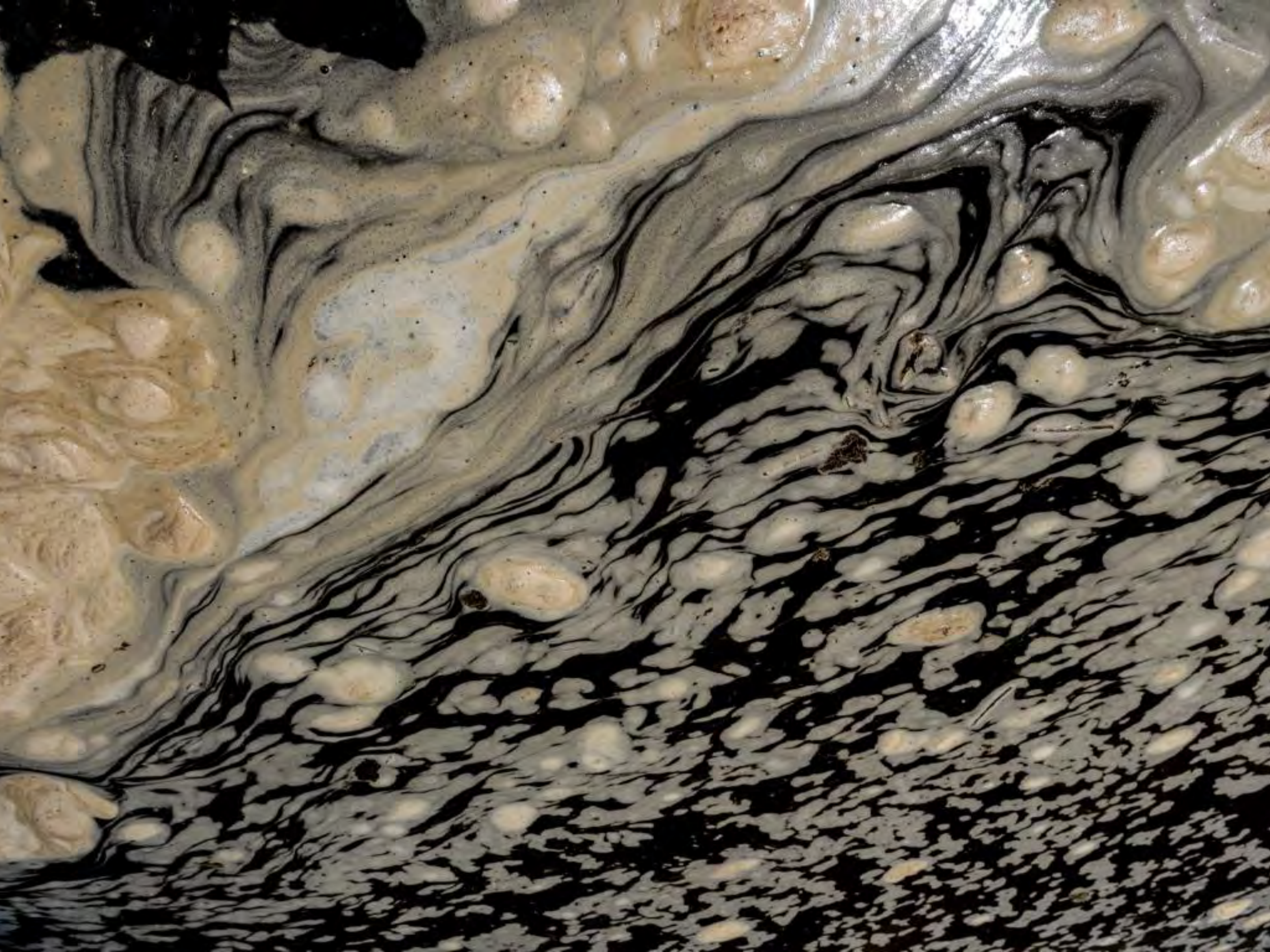


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AERIAL PHOTO POINT 1

AERIAL PHOTO POINT 2

* Main River Restoration design is dependent on existing groundwater conditions and conditions enhanced by the proposed pulse flow

** Backwater Restoration design utilized historic channels, oxbows, and existing infrastructure to capture and hold water from pulse and base flow waters (delivered via the main river channel and adjacent irrigation canals) to improve groundwater conditions and allow for restoration of native riparian habitat.

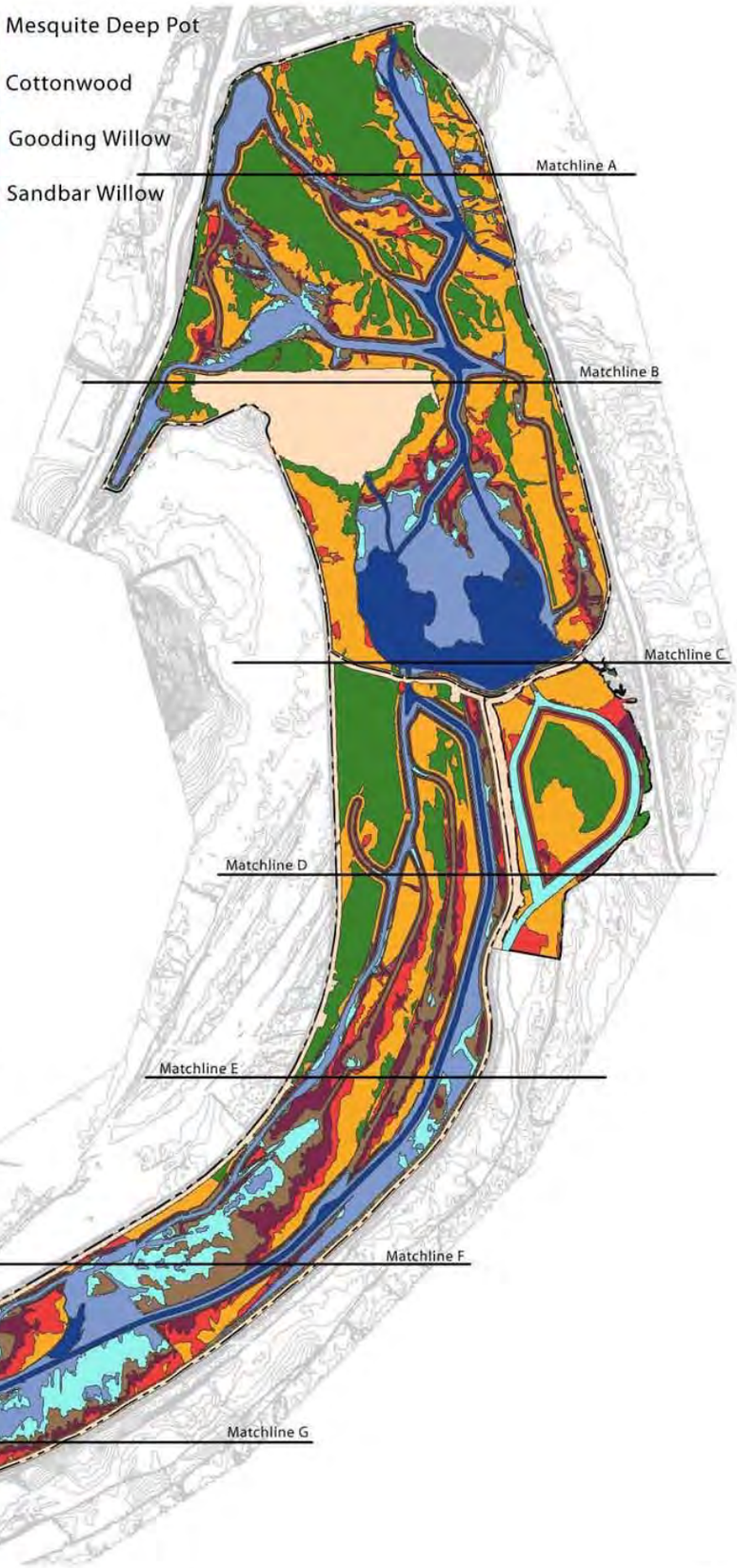
*** Agricultural Conversion design creates a series of flood irrigated cells, using water from existing irrigation infrastructure. Irrigation cells immediately adjacent to irrigation canals will be used to cultivate nursery stock for native riparian, wetland, and upland species.

LAGUNA GRANDE RESTORATION CONCEPT

Sheet # 3

Legend

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



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 = 128.8AC
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 = 55AC
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 = 9.6AC
Cottonwood = 32.8 AC
Mesquite Deep Pot = 17.3 AC
Upland Seed Mix = 7.2AC
Total Acreage Historic Channel: 88.4 Acres

*All Acreages are approximate

Natural Channel Design, Inc.

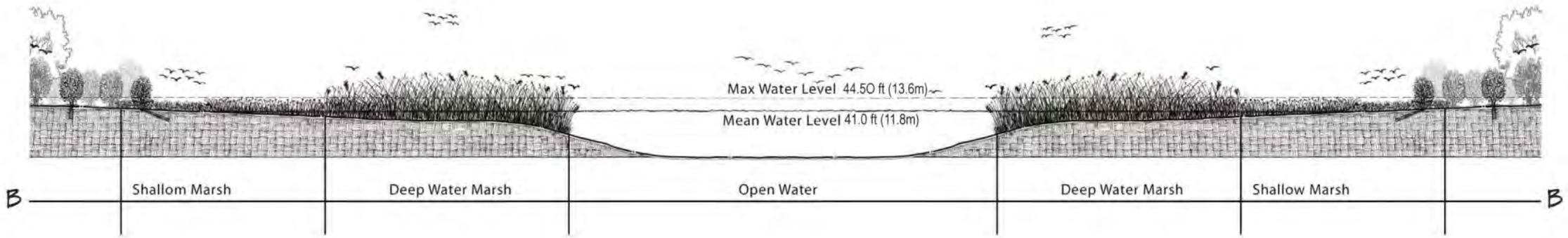
LAGUNA DIVISION CONSERVATION AREA WETLAND RESTORATION PROJECT

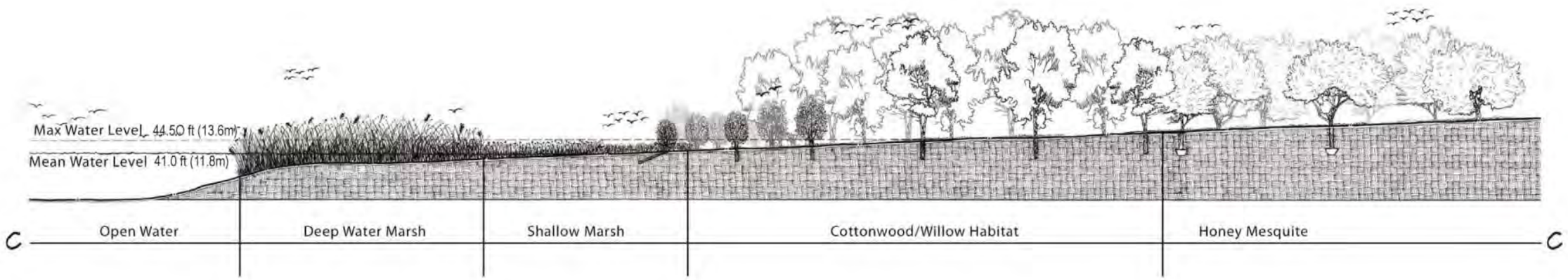
PLANTING PLAN

Figure 1A

Scale 1"=1200'
North
0 300' 600' 1200' 1800'

Date: 1/30/2012



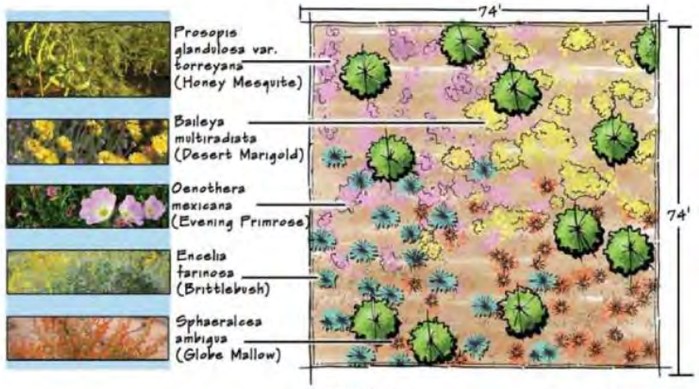


Scale: 1" = 6'

0' 3' 6' 12' 18'

LAGUNA GRANDE CONCEPT DESIGN SECTIONS

Sheet # 4



PLAN VIEW
1/8 of an Acre

0 7.5' 15' 30'

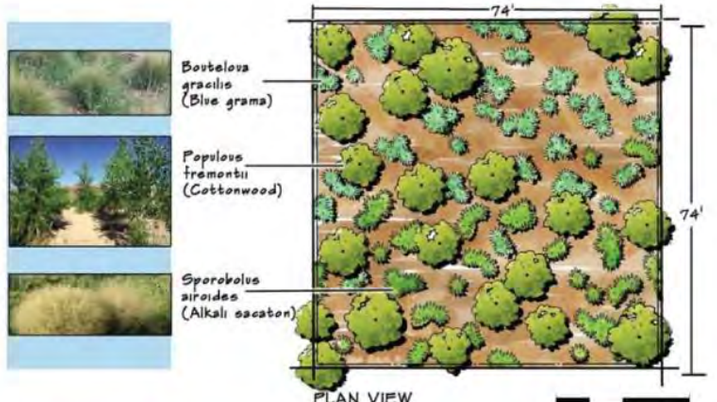
SECTION VIEW: 2-3 YRS

PLANTING ZONE PROPERTIES

Plant Specs:
* Prosopis glandulosa var. torreyana, 1 gallon, hand planted randomly 20' O.C.

Seed entire area 5 lbs per acre with Seed Mix 1:
*Oenothera mexicana
*Baileya multiradiata
*Encelia farinosa
*Sphaeralcea ambigua

PLANTING DETAIL MESQUITE HABITAT



PLAN VIEW
1/8 of an Acre

0 7.5' 15' 30'

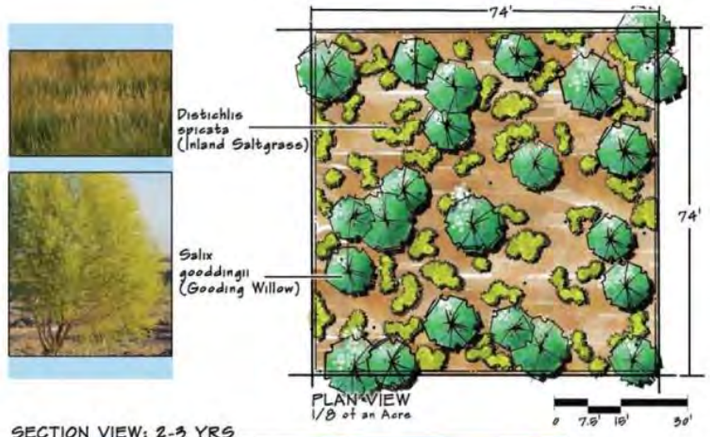
SECTION VIEW: 2-3 YRS

PLANTING ZONE PROPERTIES:

* Populous tremontii 1 gallon, hand planted randomly 15' O.C.

* Seed entire area 5 lbs per acre with Seed Mix 2:
* Sporobolus airoides
* Bouteloua gracilis

PLANT DETAIL COTTONWOOD HABITAT



PLAN VIEW
1/8 of an Acre

0 7.5' 15' 30'

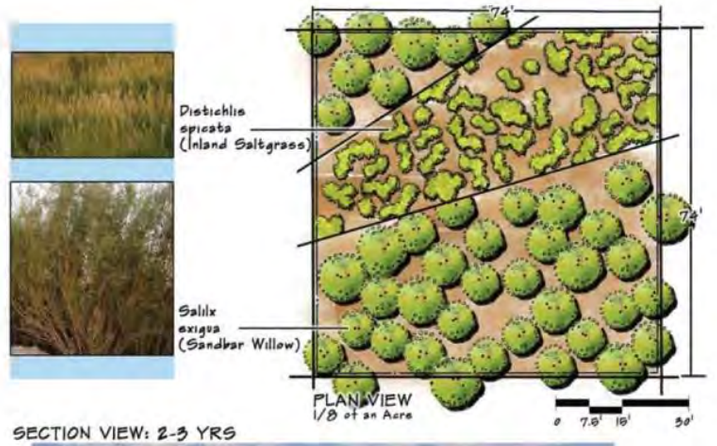
SECTION VIEW: 2-3 YRS

PLANTING ZONE PROPERTIES:

* Salix gooddingii 1 gallon, hand planted randomly 15' O.C.

* Distichlis spicata 4" plugs, hand planted randomly 5' O.C.

PLANT DETAIL GOODING WILLOW HABITAT



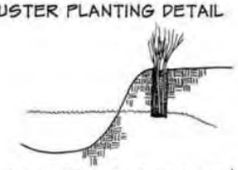
PLAN VIEW
1/8 of an Acre

0 7.5' 15' 30'

SECTION VIEW: 2-3 YRS

PLANT DETAIL SANDBAR WILLOW HABITAT

CLUSTER PLANTING DETAIL



Each cluster will have 3 poles at least 7' in length with a minimum diameter of 1/2". Holes will be augured at a 6" diameter to the lower water table of the year. All poles will be planted at the bottom of the lowest water table of the year. The above ground portion of the pole will be cut at a maximum height of 2' high and a minimum height of 18". When planted all poles will be storried in with a water auger leaving no air gaps between pole and soil. To maintain maximum soil to stem contact.
All willow pole plantings will be soaked for a minimum of 7 days prior to planting. The entire pole will be under water while being soaked.
Once poles are removed from water they will not spend more than 6 hours out of water before planting. All poles will be cut locally during plant dormancy. The tops of all poles will be sealed with latex paint to seal in moisture.

PLANTING ZONE PROPERTIES:

Plant Specs:

* Salix exigua 1 gallon, hand planted randomly 7' O.C.

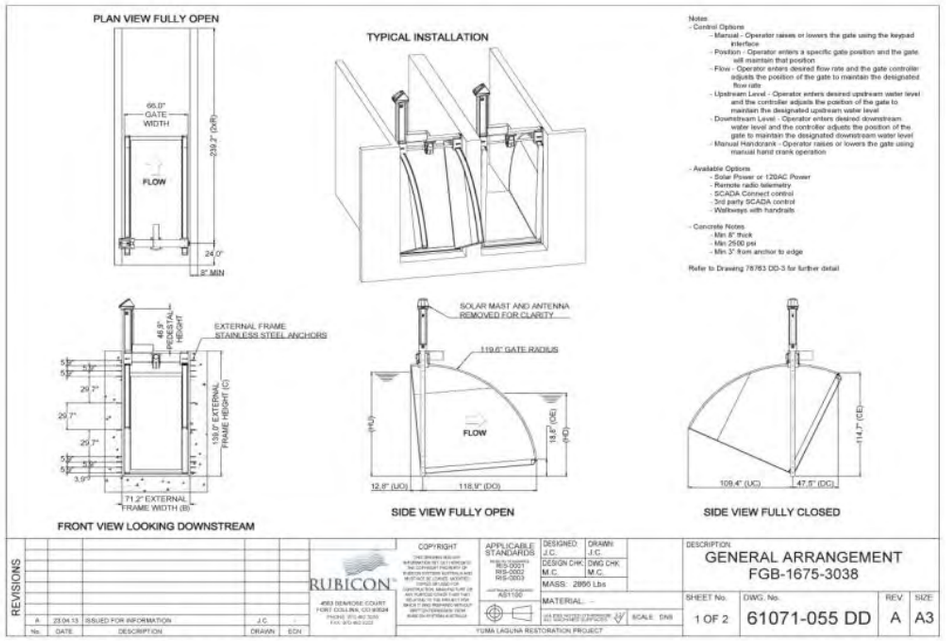
* Distichlis spicata 4" plugs hand planted randomly 5' O.C.

PLANTING ZONE DETAILS

Sheet # 5

RUBICON SLIP METER, CANAL INLET

EXAMPLE OF EARTHEN LEVEE TO CONTAIN WATER IN BACKWATER AREAS



DETAIL OF PROPOSED RUBICON POUROVER STRUCTURE

PROPOSED RUBICON POUROVER STRUCTURE

PROPOSED RUBICON POUROVER STRUCTURE WITH STOPLOG SLOTS

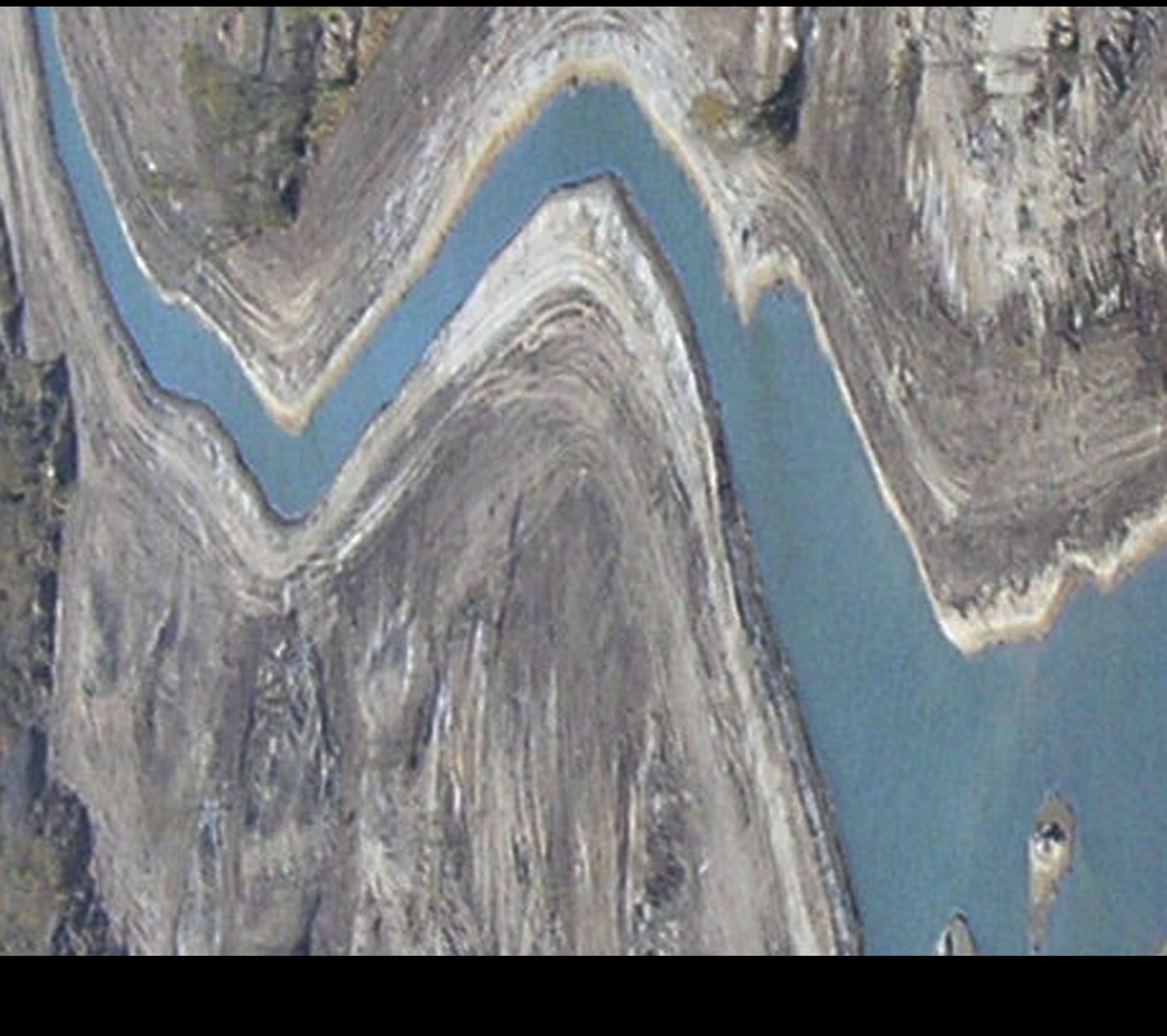
PROPOSED RUBICON POUROVER STRUCTURE

Yuma East Wetlands (YEW) prior to restoration, note invasive salt cedar and phragmites

Same site after clearing, grading, and installation of water control strutures

Site aftrer capturing river "pulse flows" and water input from adjacent agricultural ditches

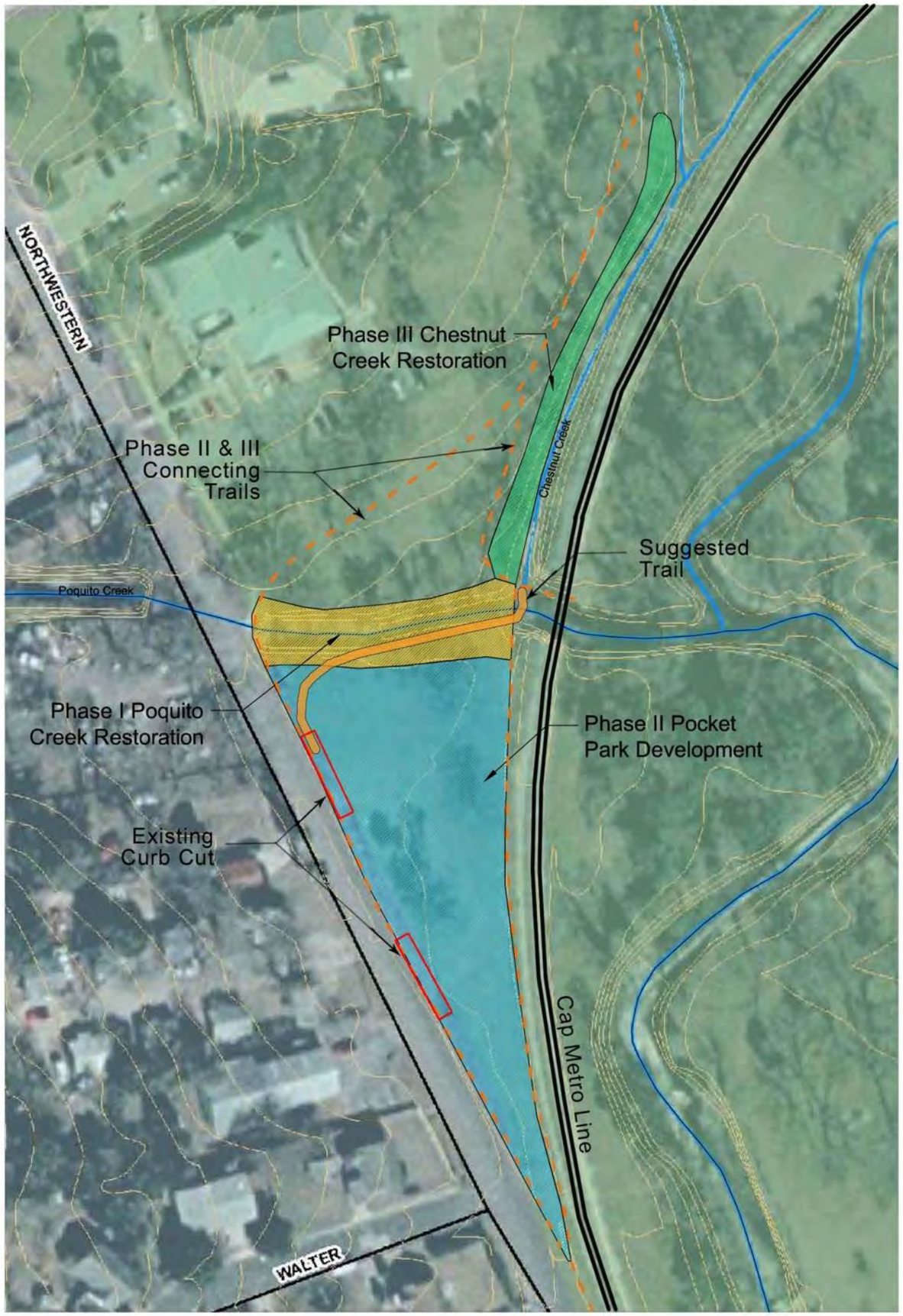
5 years post restoration (using same methods specified in this plan)



Poquito Creek Restoration

Creek People
Austin Parks Foundation
Austin Parks and Recreation
COA Watershed Protection Department
Ladybird Wildflower Center
Fred Phillips Consulting
Tauras Irrigation
Rain Lily DesignL

Austin, Texas



Scale 1"= 60'

0 5 10 20 30 NORTH

Poquito Creek Restoration Design

Figure 1

Poquito Creek Restoration Phase Map

5/30/2012

DESIGN LEGEND

Large Trees (15 gallon)

Mix of:
-Chinkapin Oak (2)
-Bur Oak (1)
-Anaqua (1)

Mixture of:
- Cottonwood (4)
- Sycamore (3)

Mixture of:
- Bald Cypress (4)
- Cedar Elm (3)

Medium Trees (5 gallon)

Mixture of:
- Possumhaw (5)
- Button Bush (4)

Grasses (1gallon)

Mistflower (17)

Purpletop (23)

Inland Seaoats (38)

Bushy Bluestem (17)

Wetland Plants

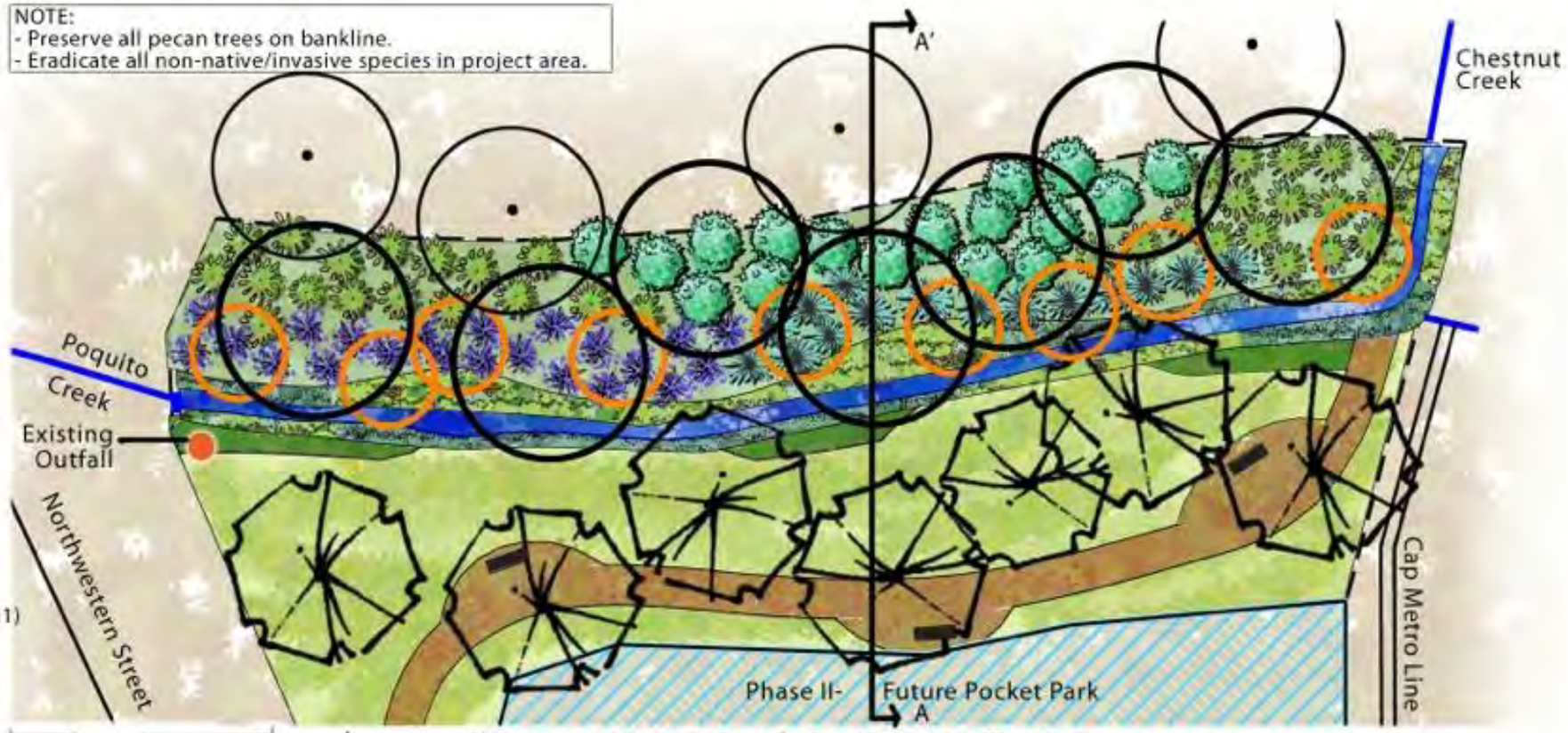
Sandbar Willow Vertical Bundles 7' O.C. (13)

Meadow Sedge/ Creek Sedge Plugs 5' O.C. (31)

Spikerush Plugs 5' O.C. (21)

Seed Mix (Purpletop, Inland Seaoats, Prairie Wildrye, Sideoats Grama, Virginia Wildrye, Plains Bristlegrass)- .12 Acres, 15 lbs per Acre

NOTE:
- Preserve all pecan trees on bankline.
- Eradicate all non-native/invasive species in project area.



Phase I- Poquito Creek Restoration Design

Existing Conditions of Poquito Creek

Restored Cross-section of Poquito Creek

Poquito Creek Restoration Design

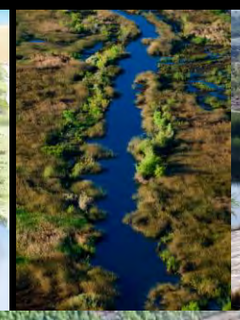
Figure 2

Phase I Restoration Design

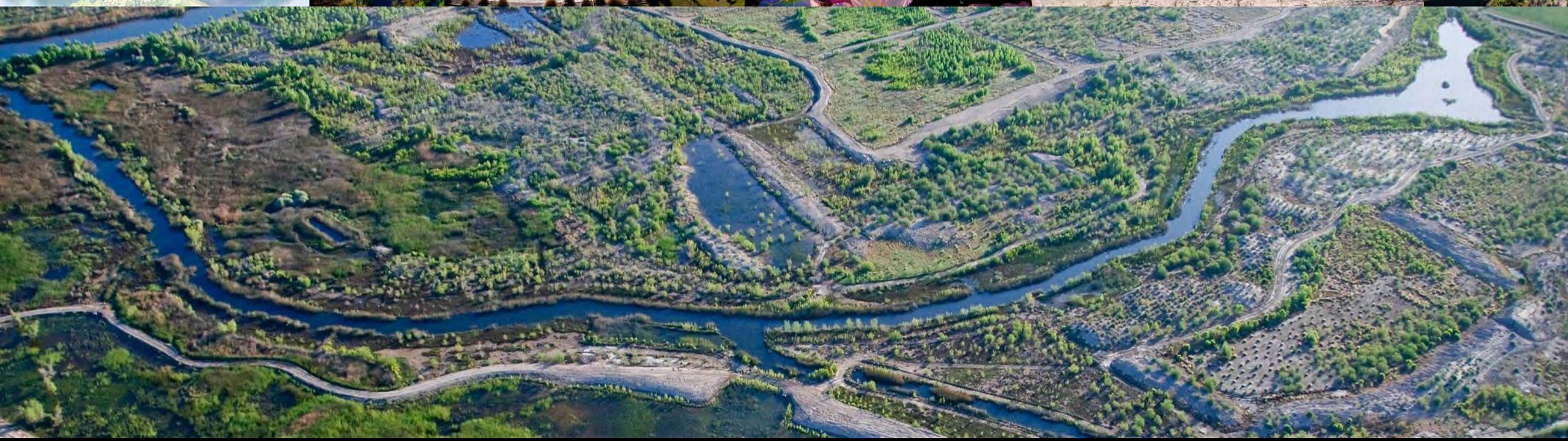
5/30/2012


225
Hastings

Landscape Architecture **Ecological Restoration** **Wildlife Biology** **Land Management**



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