San Elijo Lagoon Restoration

Pacific Chapter, WEDA

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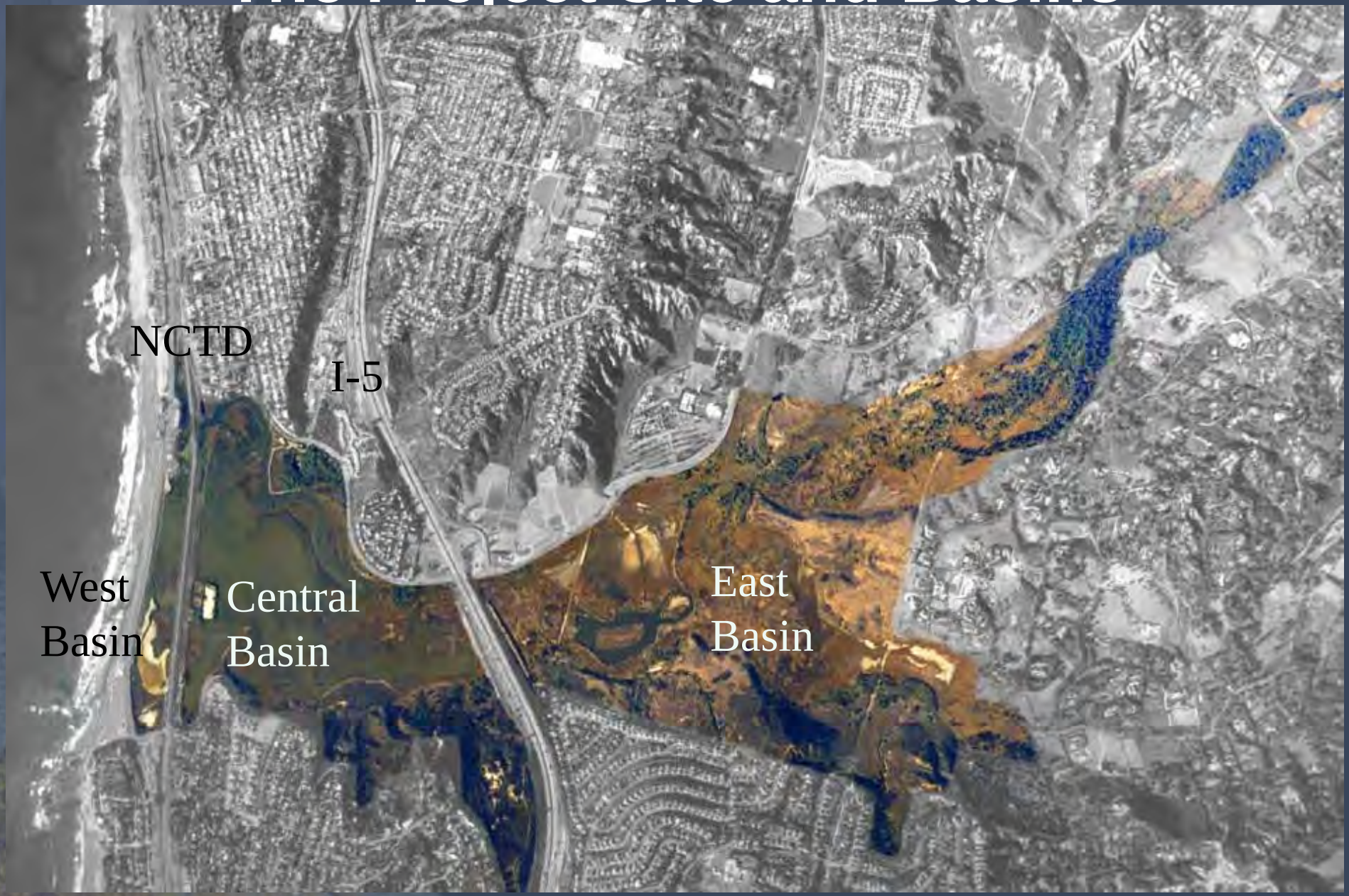
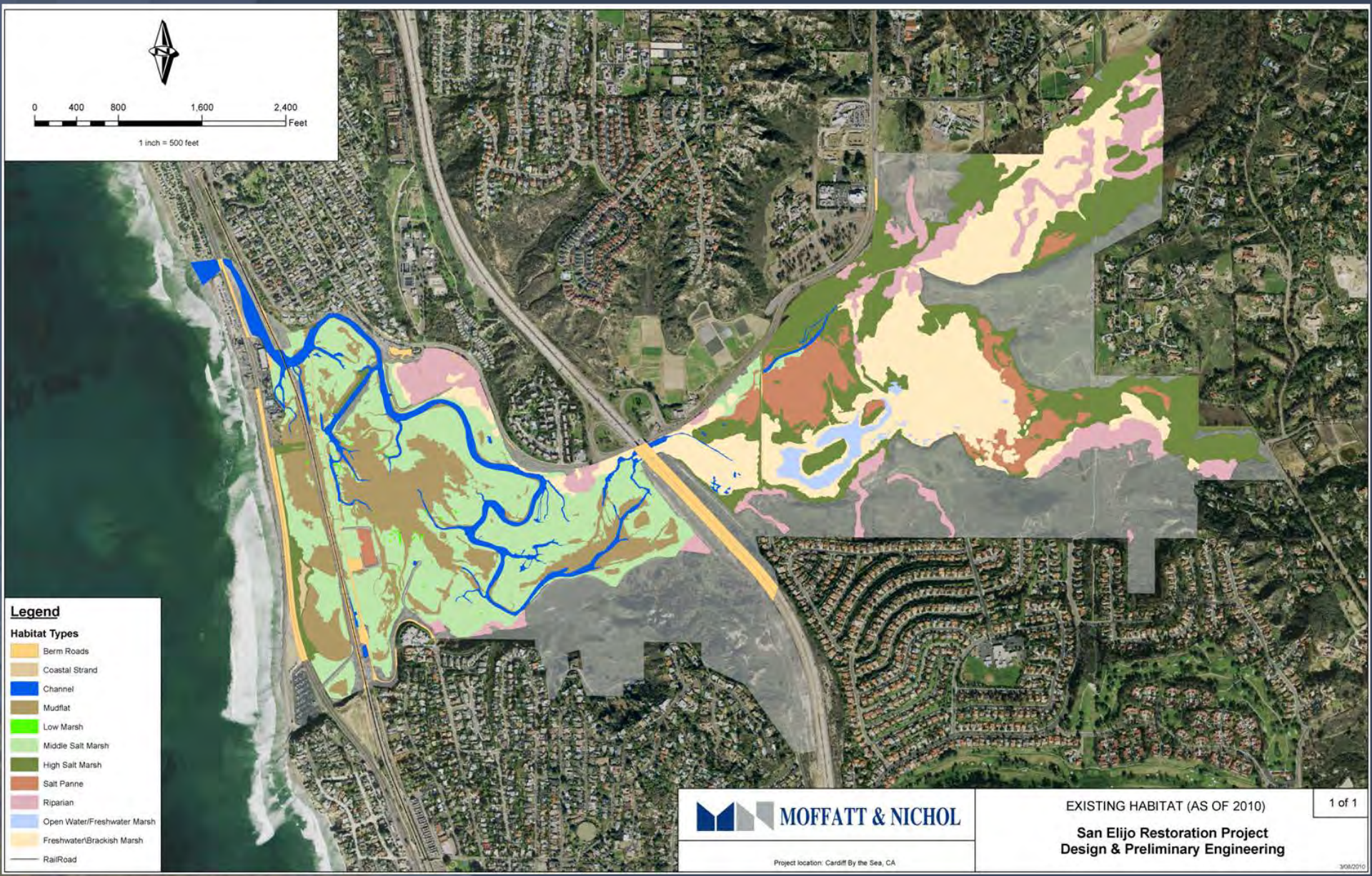
Western Dredging Association

The Project Site and Basins



Existing Habitat



Timeline

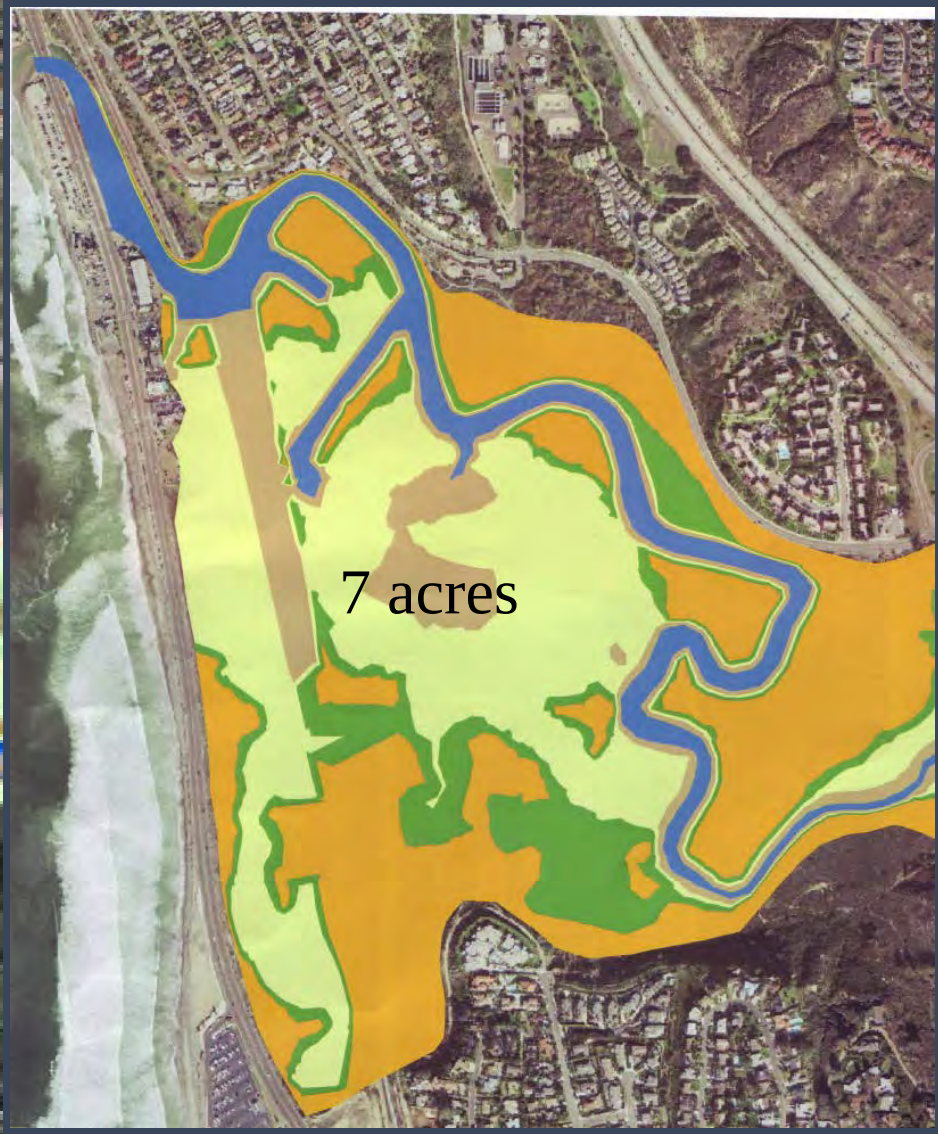
- 22 years-
  - 10 years of study
  - 5 years of funding
  - 5 years of design
  - 2 years of procurement
  - 3 years of construction
  - 5 years of monitoring

Existing Conditions and Problems

- Major infrastructure (3 transportation corridors) crosses the site
  - Causes habitat fragmentation
  - Impedes tidal circulation and storm drainage
- The watershed is modified from historic conditions and lagoon encroachment occurs
  - Contributes sediment, nutrients and bacteria
  - Lagoon is 303d listed for all of these
- **The Lagoon is degraded**

Existing Habitat 2010

Predicted Change of Mudflat



Coordination

Phase One (CMGC) Improvements

Highway Phase 1 (includes sound walls on private property (2015-2018) - $480 million (est.)

- Lomas Santa Fe to Birmingham Drive
- 2 Birmingham Drive to Leucadia Boulevard
- 3 Leucadia Boulevard to Palomar Airport Road
- 4 Palomar Airport Road to SR-78

Railroad Phase 1 (2015-2018) - $115 million (est.)

- 5 Batiquitos Lagoon Double Track
- 6 San Elijo Lagoon Double Track

Environment Phase 1 (2015-2018) - $55 million (est.)

- San Elijo Lagoon Restoration Project

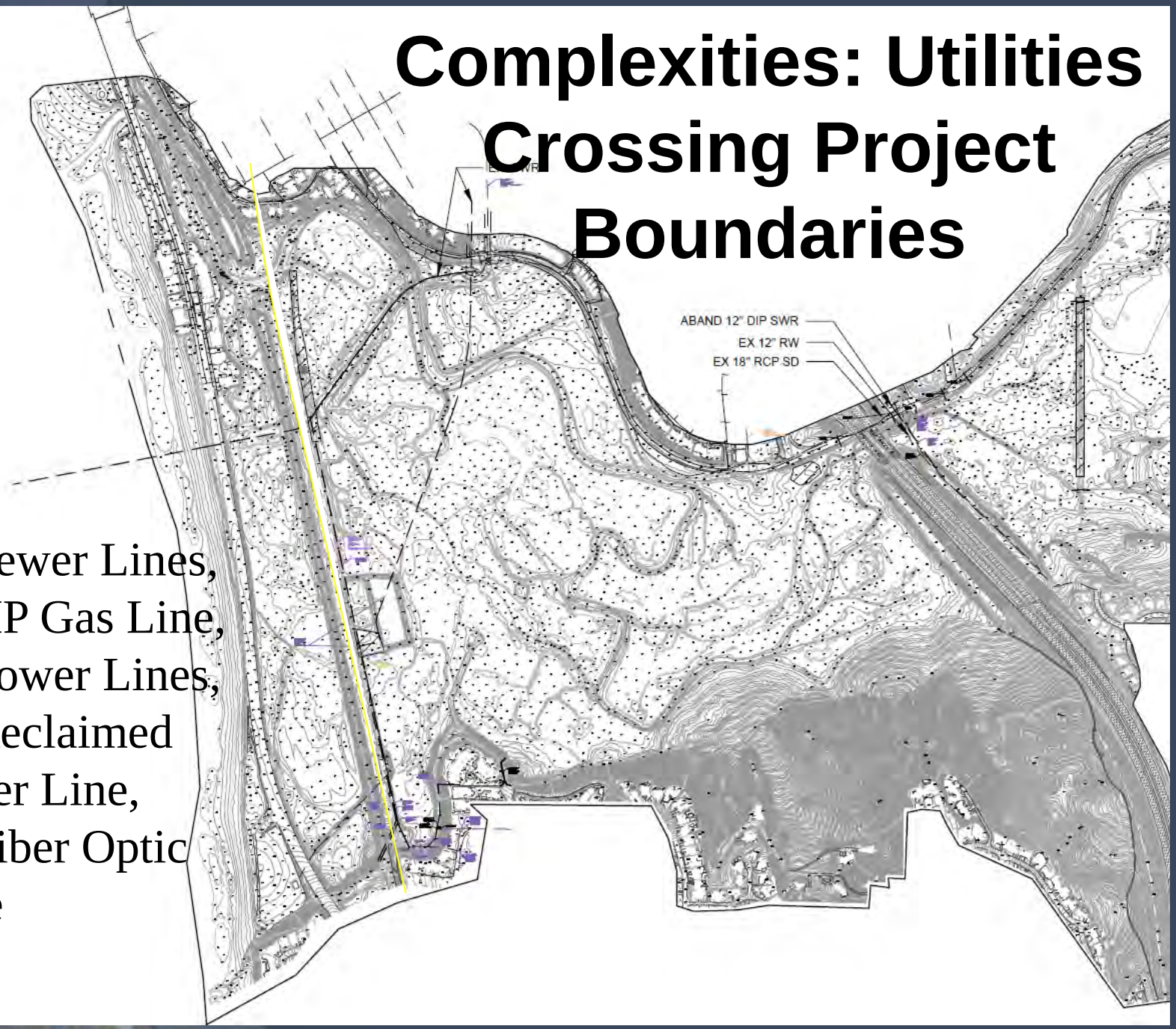
Multiple Benefits Include:

- Large-scale lagoon enhancement, restoration, preservation, re-creation
- Major infrastructure improvements
  - I-5 bridge replacement and channel widening
  - LOSSAN rail bridge replacement and double-tracking
- Public amenities
  - Pedestrian pathways/trails
  - Interpretive opportunities

Coordination – Information and Resource Sharing

1. Caltrans
2. SANDAG
3. San Elijo Lagoon Conservancy
4. General Contractor/Construction Manager
5. Designers/Consultants
6. Permit and Resource Agencies

Complexities: Utilities Crossing Project Boundaries

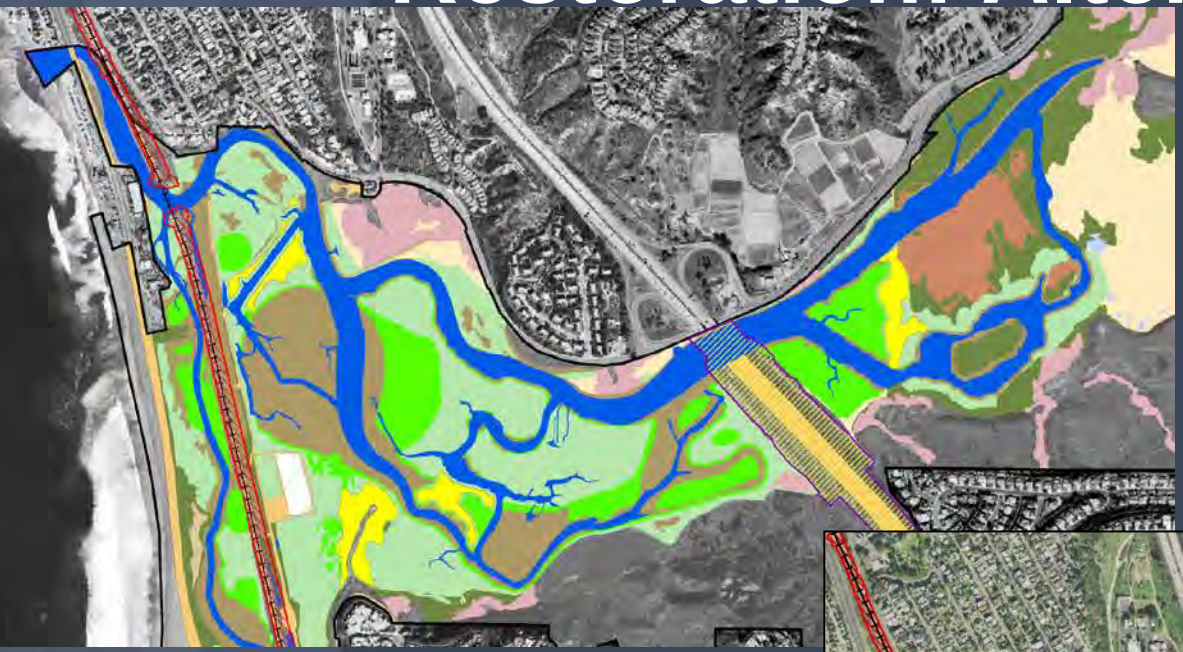


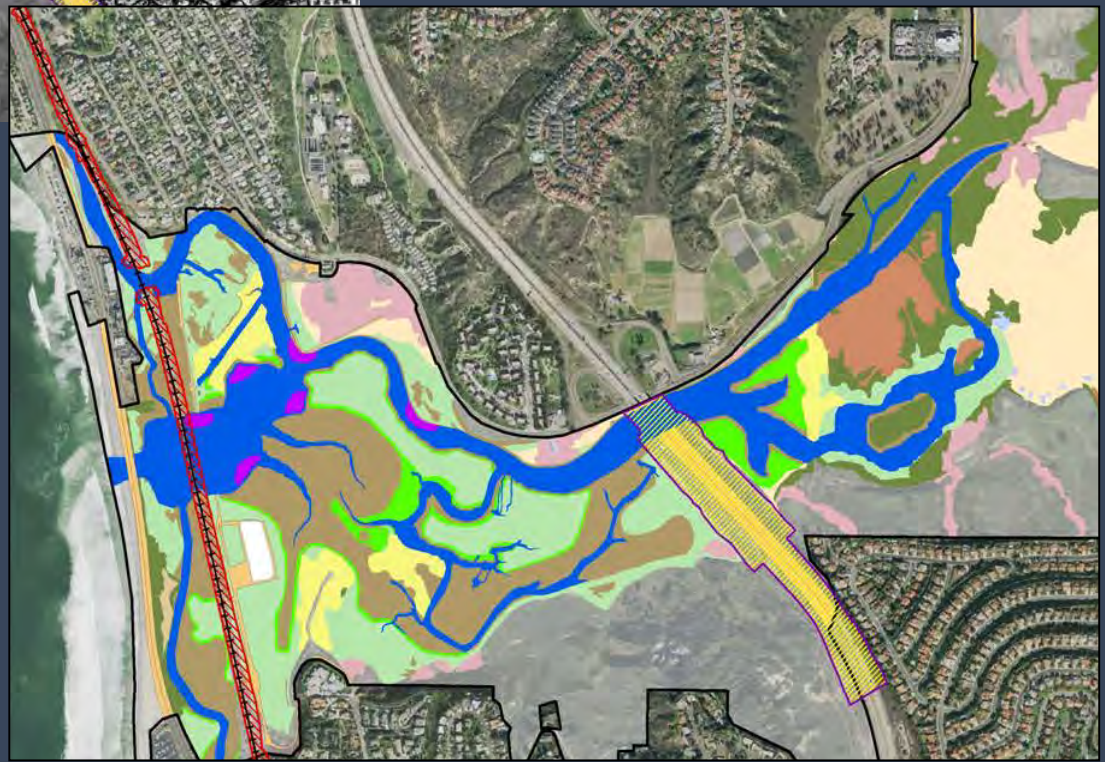
- 3 Sewer Lines,
- 1 HP Gas Line,
- 2 Power Lines,
- 1 Reclaimed Water Line,
- 1 Fiber Optic Line

SELRP Permits/Coordination (Partial)

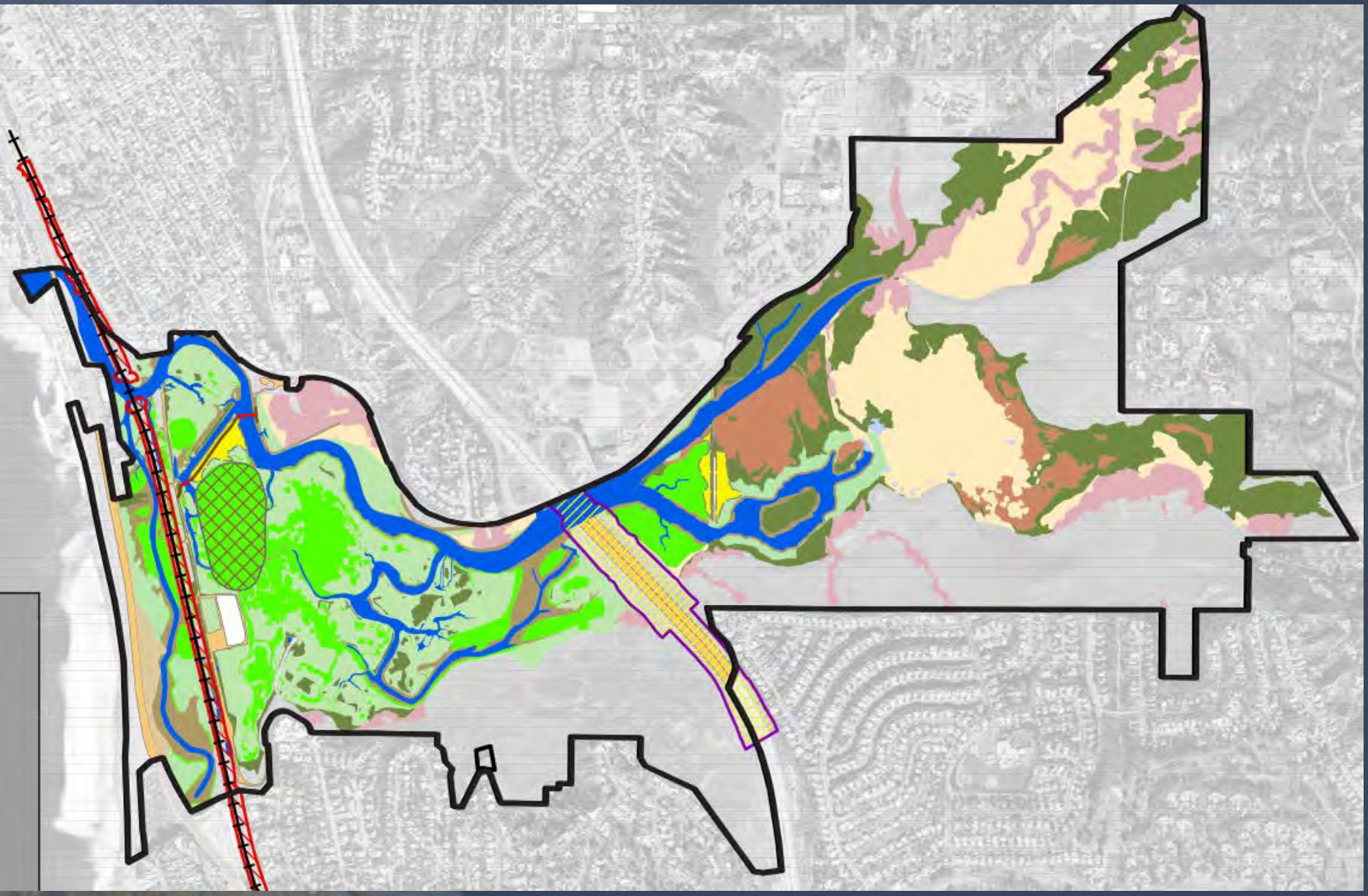
- USACE
- NMFS
- USCG
- USFWS
- CCC
- CDFW
- State Parks
- Caltrans
- SLC,
- City of Encinitas & Solana Beach,
- SCE,
- SDGE,
- Water Districts (3),
- NCTD
- APCD,

Restoration: Alternatives





Modified Alt 1B Refined (Chosen)



Restoration: Resiliency to Climate Change

- Existing transitional habitat areas in the Central and East Basins to provide future salt marsh areas
- Include raised areas in the design now
- Design marsh elevations and slopes to preserve marsh areas over time

Construction Phasing

Phase 1	Phase 2	Phase 3	Phase 4
Over-Dredge Pit to Cardiff & Solana Beach	Central Basin to Pit-(Overlap)	East Basin to Pit	West Basin/Tidal Inlet to Pit, Nest Site
Feb 2018 – June 2018	July 2018- Oct 2018 (16”) Dec 2018- April 2019 (10”)	Nov 2018- Apr 2019	April 2019- December 2019
Dredge 500kcy with a 16” Dredge 6500cy/day	Dredge 270k cy and pump to Pit	Dredge 322k cy and pump to Pit	Dredge 30,000 by pump to cap pit and nest site as cover

- Dike Construction

- Temporary Dikes

- Pit Dredging

- Dredging OD Pit
- Beach Construction at Cardiff State Beach

- Pipeline Installation

- Beach Building

- Beach Construction at Cardiff State Beach

- Water control system

- Amphibious Excavator

- Clearing and Grubbing, East Basin

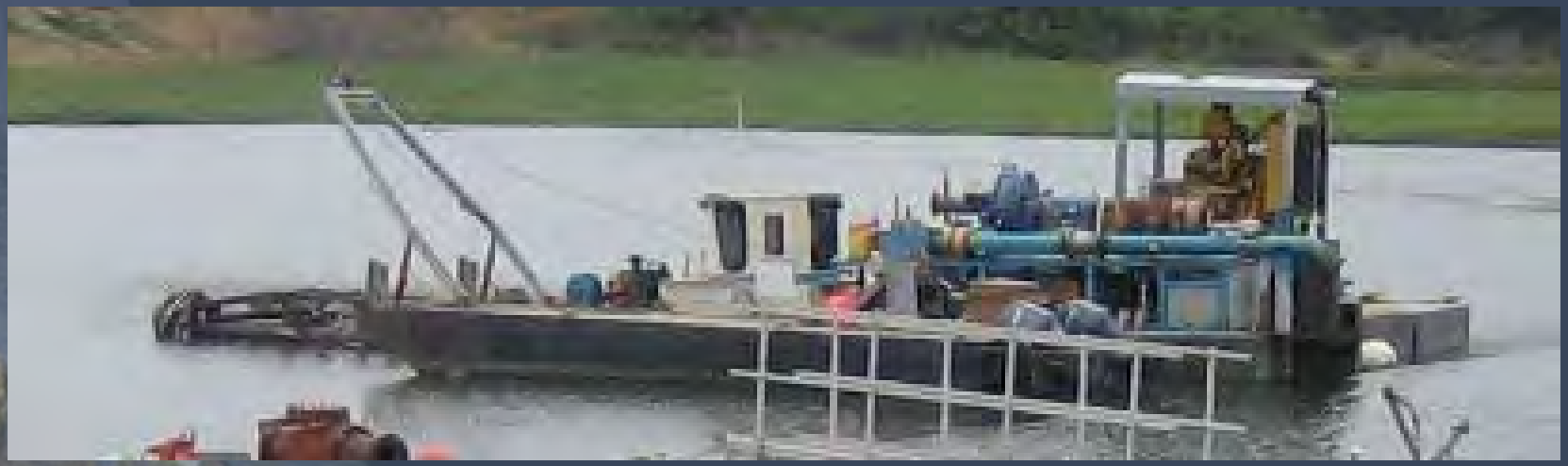
- Amphibious Excavators Tidal Channels

- Tidal Channels Bank Excavation Complete

- Dredging Central Basin- Prestaged Bank Material

Dredge Stats

- 16” Cutter Suction- Dredge #10 (Ross Island)
  - 2x 900 HP diesel
  - 6000 cy/day, (Beach and nearby channel)
  - 3000 cy/day (Distant/tight geometry
- 10” Cutter Suction- ‘Baracuda’ dredge (Dixon)
  - 460 HP Diesel
  - 1,000 cy/day
  - Swinging Ladder



- Dredging Central Basin (Main Channel)

- Overview of Construction in Central Basin

- Excavation for Low Marsh in East Basin

- Dry Excavation for Low Marsh in East Basin

- Temp Access Road in Channel

- Rock Toe Excavation

- Rock Placement

- Channel Excation

Schedule (Dredging)

1. Overall Dredge= 1 yr 10 mo. (1.2 mcy)
2. Beach phase= 5 mo (500k cy)
3. Central Basin (270 k cy) 2 dredges, 2 phases) 10 mo
4. East Basin (322 k cy)= 6 mo
5. West Basin (30k cy)= 7 mo

Note: Overlap with dredges.

Costs

1. Overall project= $100 million
2. Overall dredge including Mob=$40.4 mil
3. Unit rates-
    1. Beach nearby = $10.24/cy
    2. Beach distant=12.75/cy
    3. Pit nearby= $33.13/cy
    4. Pit distant=$40.8/cy
    5. Pit close quarters=$58.7
    6. Mob/Demob (both dredges/onsite remob)=$5.7 mil

Next Steps

1. Remove water control structures
2. Planting and 1 year plant establishment
3. Demob
4. Monitoring (5 years)
5. Enjoy the wetlands