From Fill to Function:
Coming to a Wetland Near You

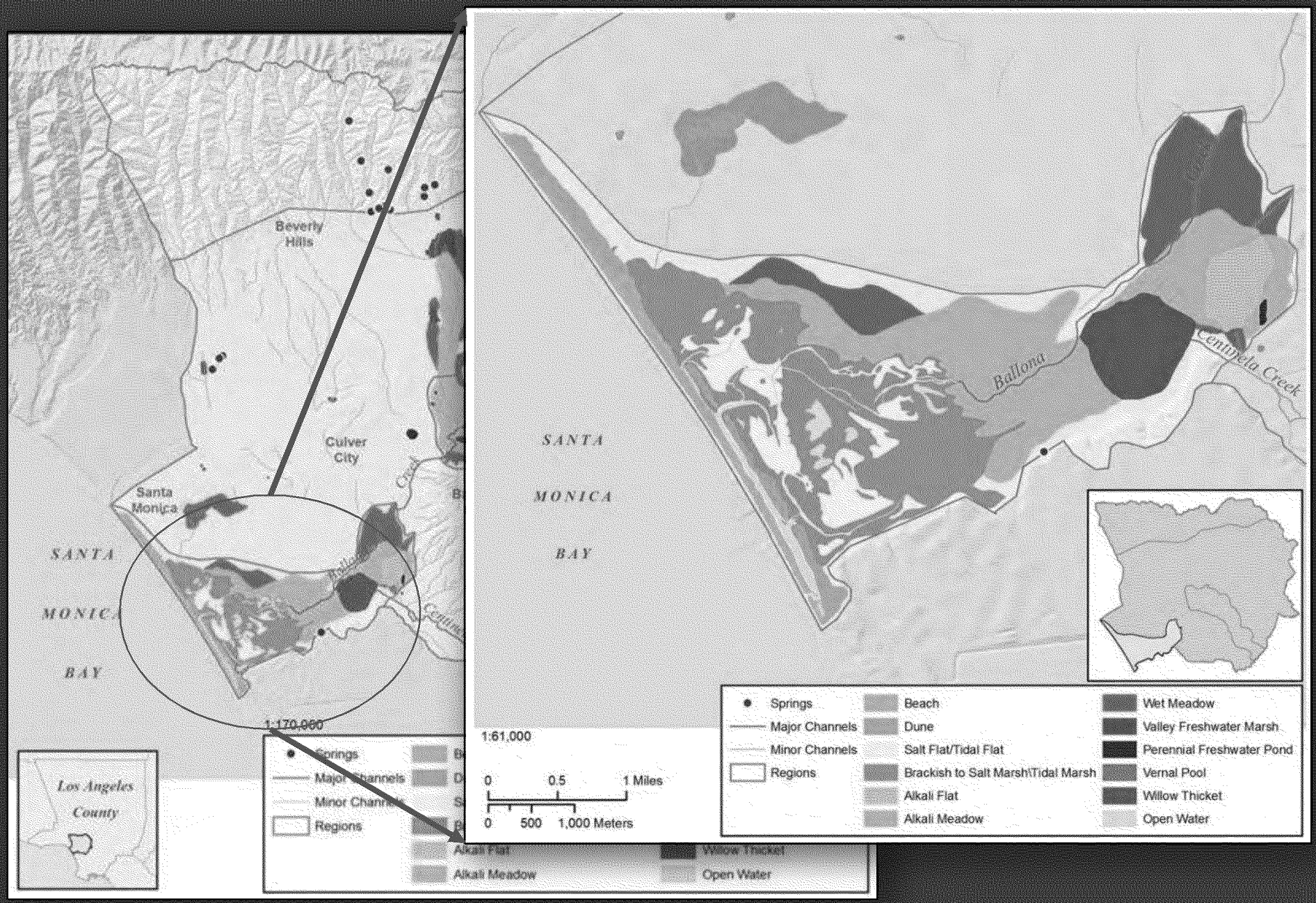
Restoration of the Ballona Wetlands Ecological Reserve

THE BAY FOUNDATION

Karina Johnston
Science Director
The Bay Foundation

Presentation Outline

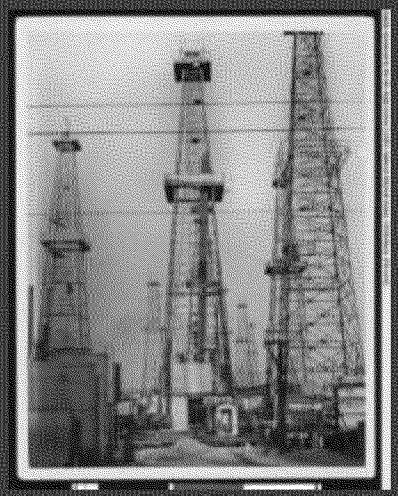
- Historical Ecology
- Current Stressors
- Baseline Monitoring Results
- Regional Data Results
- Restoration Process
- Restoration Alternatives 1-4


Beverly Hills
Culver City
Santa Monica
SANTA MONICA BAY
Ballona
Centinela Creek
1:170,000
Los Angeles County
Springs
Major Channels
Minor Channels
Regions
Alkali Flat
Alkali Meadow
Willow Thicket
Open Water
1:61,000
0 0.5 1 Miles
0 500 1,000 Meters
Beach
Dune
Salt Flat/Tidal Flat
Brackish to Salt Marsh\Tidal Marsh
Wet Meadow
Valley Freshwater Marsh
Perennial Freshwater Pond
Vernal Pool

Historic Ballona – 1876 T-Sheet

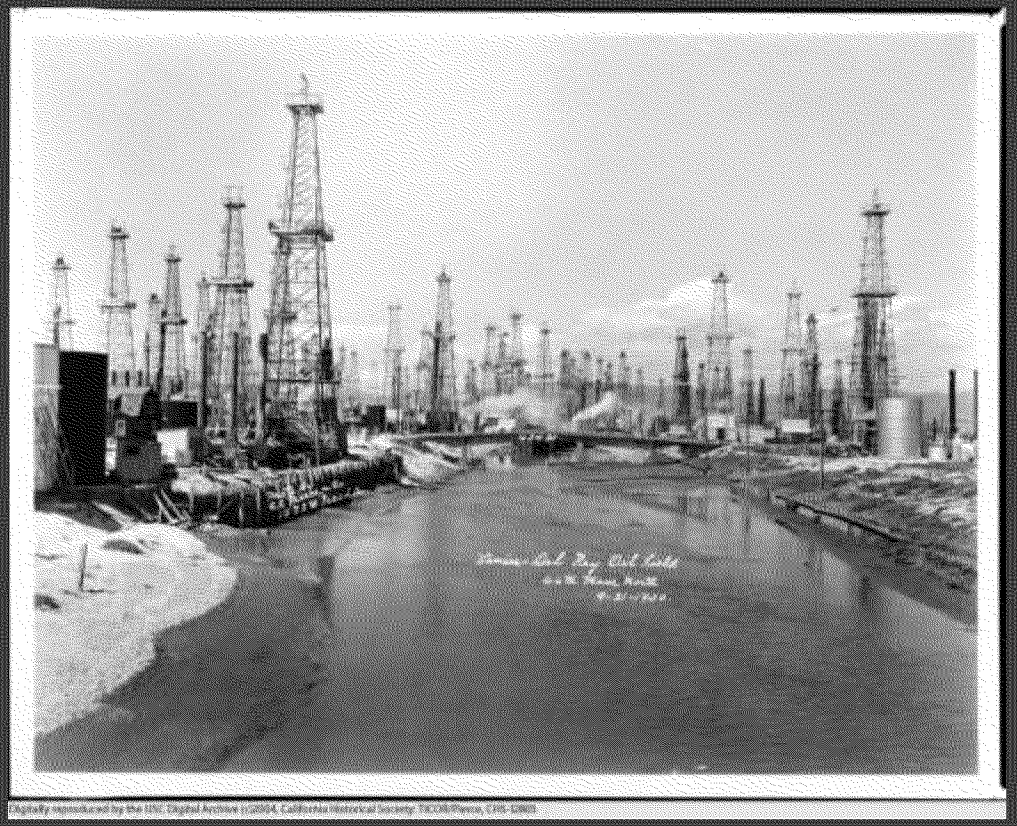
Courtesy SCCWRP (2011)

Oil Fields



Oil derricks in Playa Del Rey, 1925 (USC)

Oil derricks in Venice, 1930 (USC)



Agriculture and the Marina completion

Marina del Rey, 1968 (LAPL)

Celery patch, 1927 (USC)

Ballona Wetlands Ecological Reserve

www.ballonarestoration.org

- < 600 acres
- Largest wetland restoration project in Los Angeles County
- Owned by the state of California; managed by CDFW (and SLC) as an ecological reserve
- SCC funded monitoring
- CDFW + Corps = lead agencies

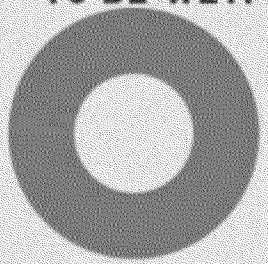
BWER Stressors

- Modified hydrology
  - Dredging & fill dump
  - Levees, culverts , & channelization
  - Paving & roads
  - Draining
- Water quality
  - Non-point source discharges
  - Trash
  - Heavy metal impairments
  - Bacteria and pathogen impairments
  - Other impairments
- Habitat destruction
  - Fragmentation
  - Invasive & introduced species
  - Introduced predators
  - Noise and light pollution
- Additional stressors
  - Vector control
  - Physical modifications
  - Misuse of the site
  - Sea level rise & climate change

WATER

AT THE BALLONA WETLANDS ECOLOGICAL RESERVE

WETLANDS NEED TO BE WET!

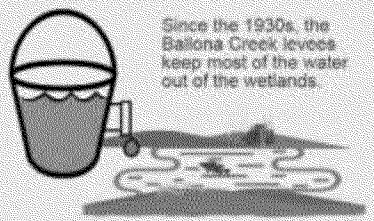


Wetlands need water to be healthy. Right now there is very little water in Ballona.

Innundated (3%)

No Tidal Water (97%)

LEVEES CUT OFF THE WATER



Since the 1930s, the Ballona Creek levees keep most of the water out of the wetlands.

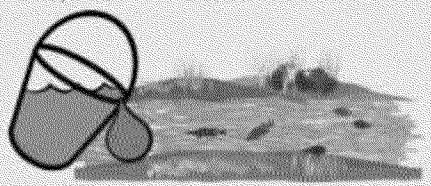
Only a single set of tide gates allows water into a small area.

MORE WATER MEANS...

More water in the wetlands means more native plants and more habitat for birds and animals.

Improved habitats will reestablish healthy fish nurseries and more diverse native plant communities that support butterflies, insects, shade for legless lizards, protection for birds, and much more.

Increased water along with habitat restoration will allow native species to flourish, which will delight nature-lovers.



...MORE WILDLIFE TO ENJOY

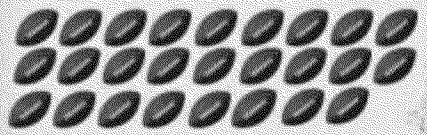
For more information visit: ballonarestoration.org

INVASIVES

AT THE BALLONA WETLANDS ECOLOGICAL RESERVE

INVASIVE PLANTS HAVE TAKEN OVER

Invasive iceplant covers 35 acres of the wetlands, equivalent to 26 football fields



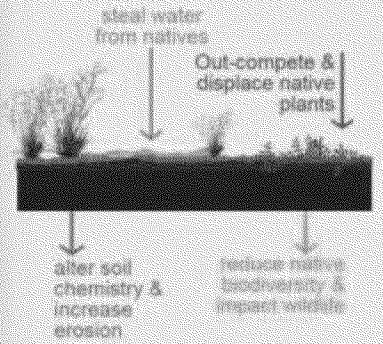
WORST WEED INVADERS OF WETLANDS

- Giant Reed
- Iceplant
- Mustard
- Euphorbia
- Crown Daisy
- Castor Bean

Invasive plants not only affect biodiversity and ecosystem functioning, but also human use and enjoyment of wetlands

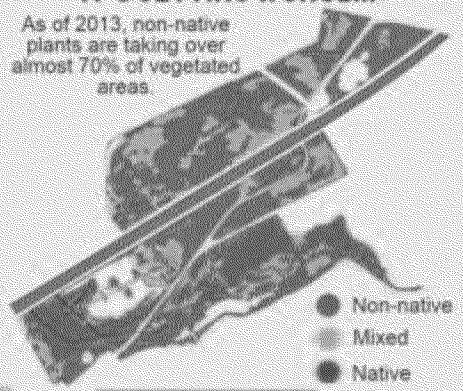
WHAT'S THE PROBLEM?

NON-NATIVE PLANTS...



IT'S GETTING WORSE...

As of 2013, non-native plants are taking over almost 70% of vegetated areas.



Over 25 acres of native alkali weed was replaced by non-natives such as black mustard over the course of 6 years.

This shows that if we do nothing, we are harming the system.

For more information visit: ballonarestoration.org

Ballona Reserve - Topography

Topography

Elevation (in feet above mean sea level)

- ≤ 0 (approximately mean sea level)
- 0 - 1
- 1 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 50
- 50 - 100
- 100 - 150
- > 150 feet above mean sea level

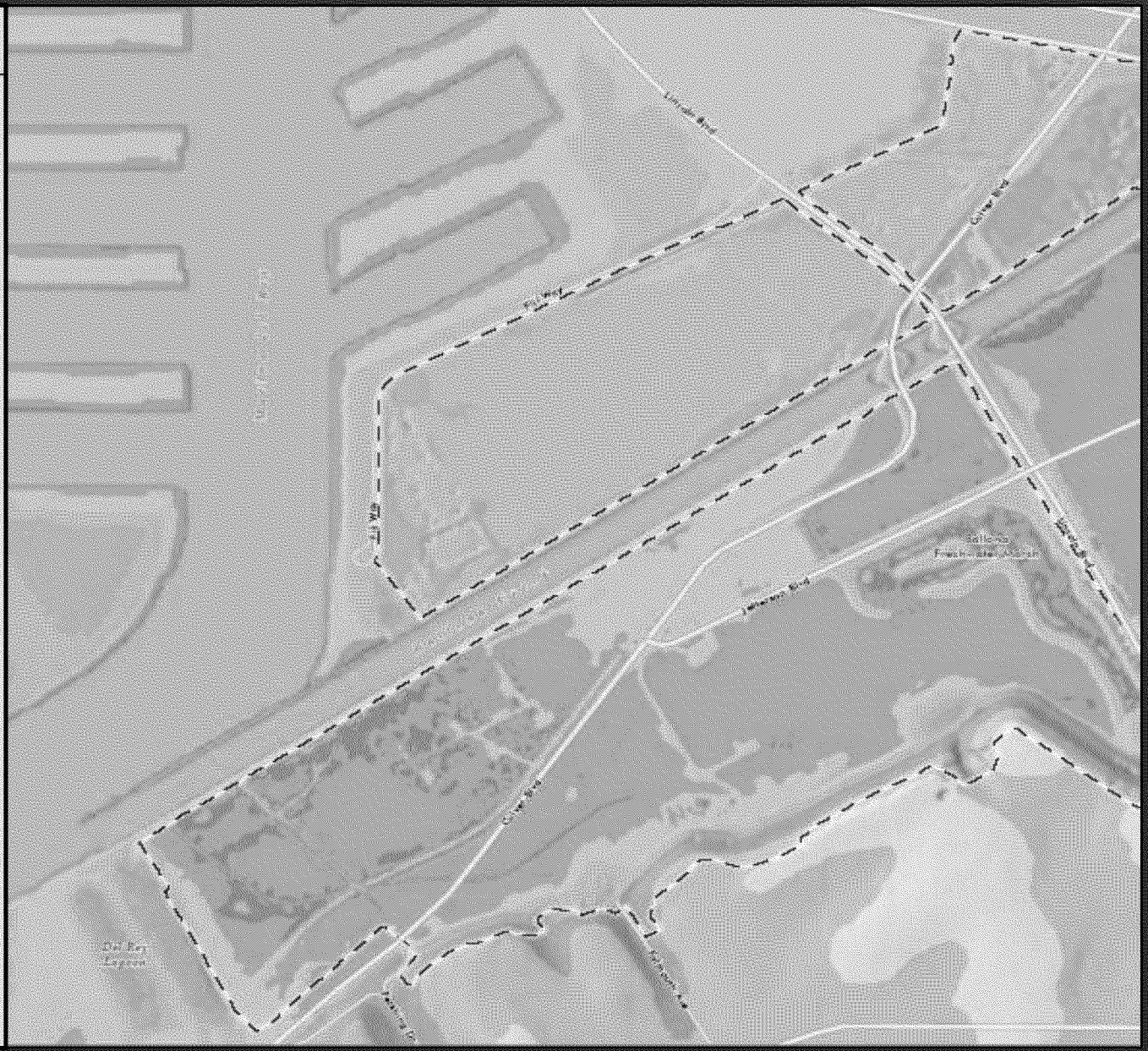
Ballona Wetlands Project Area Boundary

Coastal Conservancy

0 0.125 0.25 Miles

Elevation surface created by Greenlnfo Network, based on digitized contours and spot elevations provided by R.J. Lung & Associates, April 1998, and USGS 10-m Digital Elevation Model (DEM). Elevation values based on NGVD29.

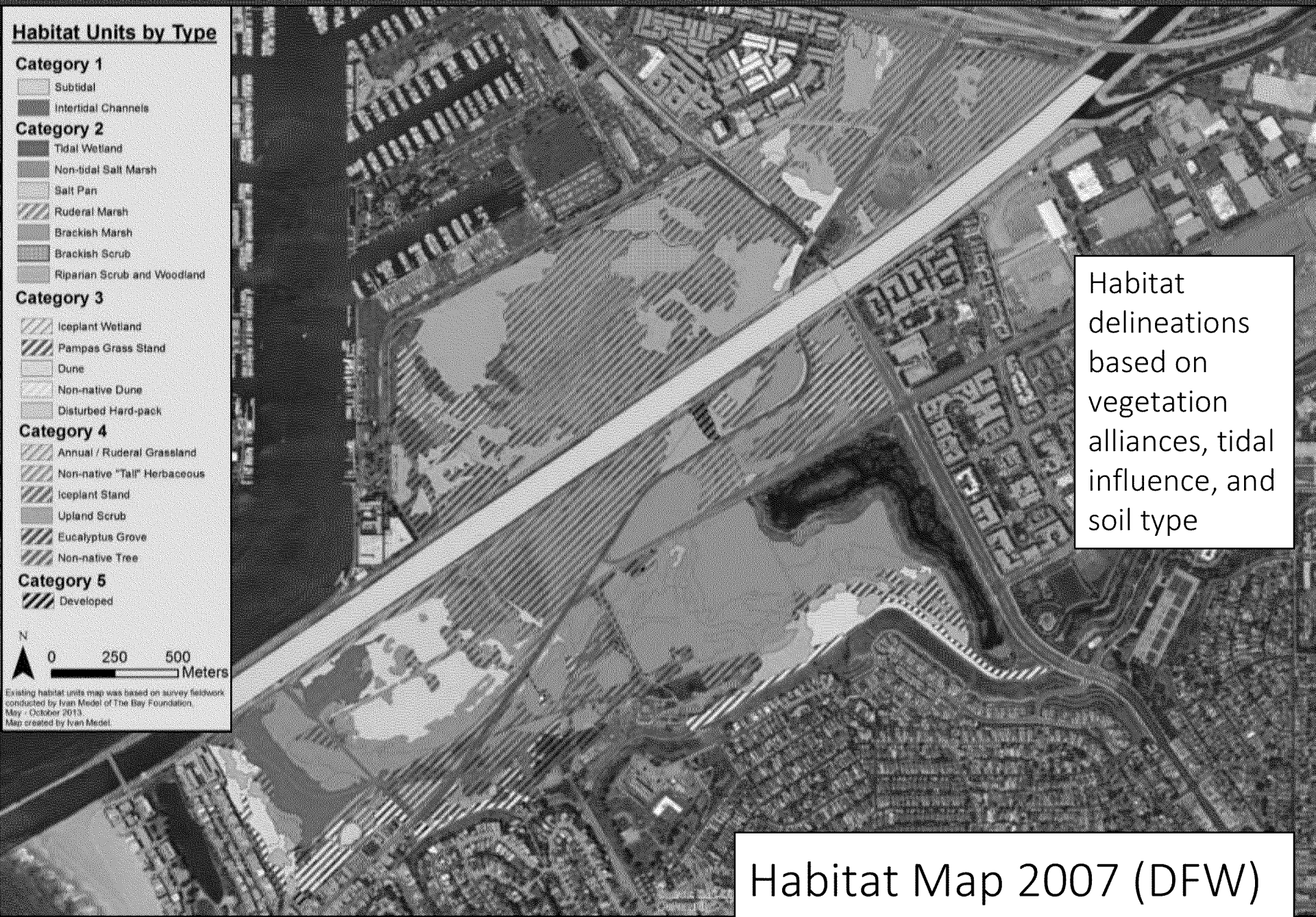
Map created by Greenlnfo Network, November 2006.



Monitoring Reports: Chapter Info & Summary of Protocols

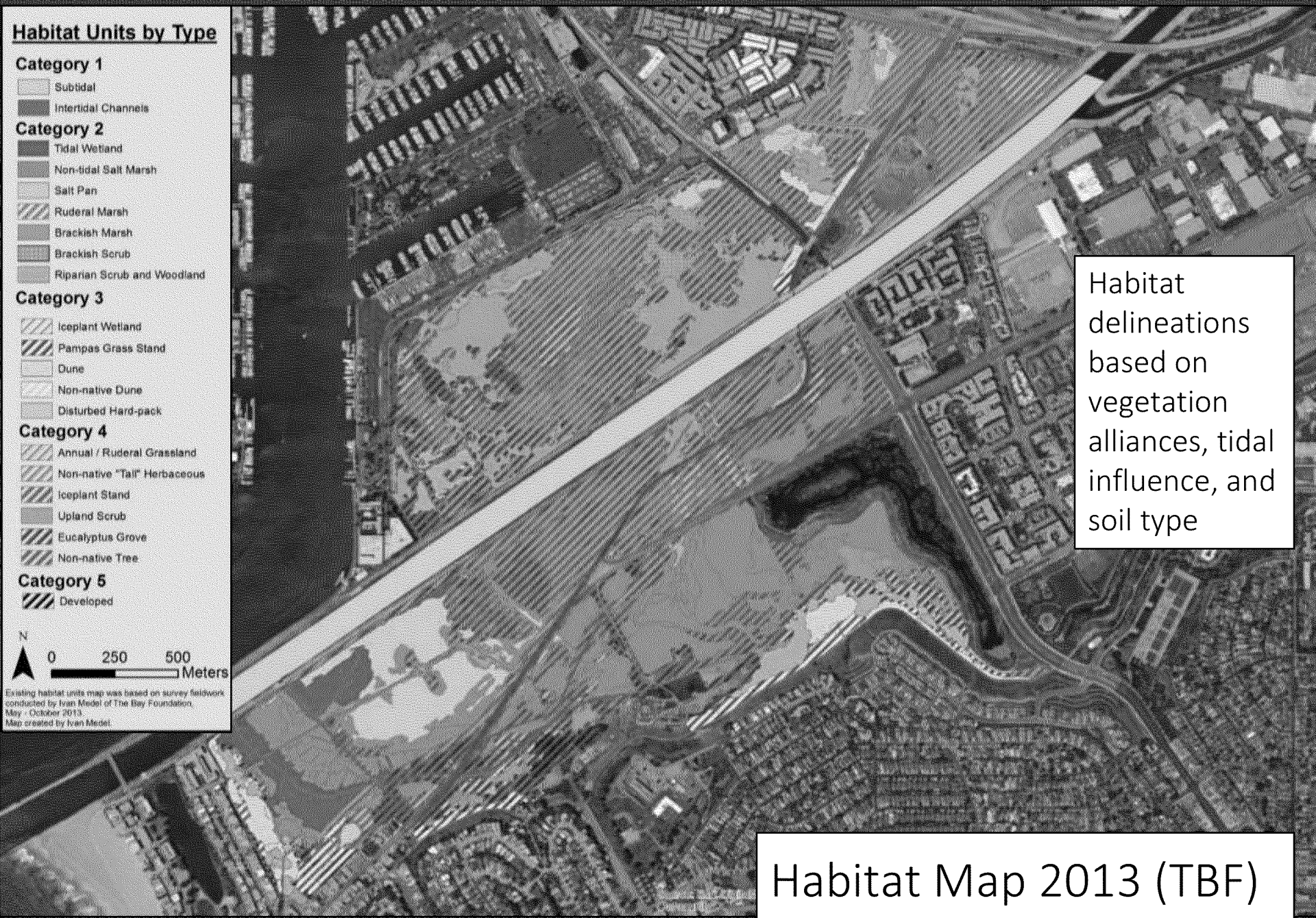
- 5 years of monitoring
- Part of EPA regional monitoring program

- Ch. 1 Water Quality
  - (bacteria, nutrients, trace metals, general/continuous monitoring)
- Ch. 2 Marine Sediment
  - (trace metals, pesticides, PCBs, etc)
- Ch. 3 Terrestrial Soils
  - (trace metals, organic content)
- Ch. 4 Vegetation
  - (stratified random transect sampling – all habitats)
- Ch. 5 Fish
  - (beach seines w/blocking nets, shrimp trawl, minnow traps)
- Ch. 6 Herpetofauna
  - (pitfall traps, coverboard arrays)
- Ch. 7 Mammals
  - (Sherman live traps, motion cameras)
- Ch. 8 Birds
  - (site-wide surveys, breeding, waterbird)
- Ch. 9 Benthic Invertebrates
  - (shallow & deep cores)
- Ch. 10 Terrestrial Invertebrates
  - (productivity metric & pitfall traps)
- Ch. 11 Physical Characteristics
  - (t-sect elevations, cross-sections, velocity, inundation mapping)



Habitat delineations based on vegetation alliances, tidal influence, and soil type

Habitat Map 2007 (DFW)

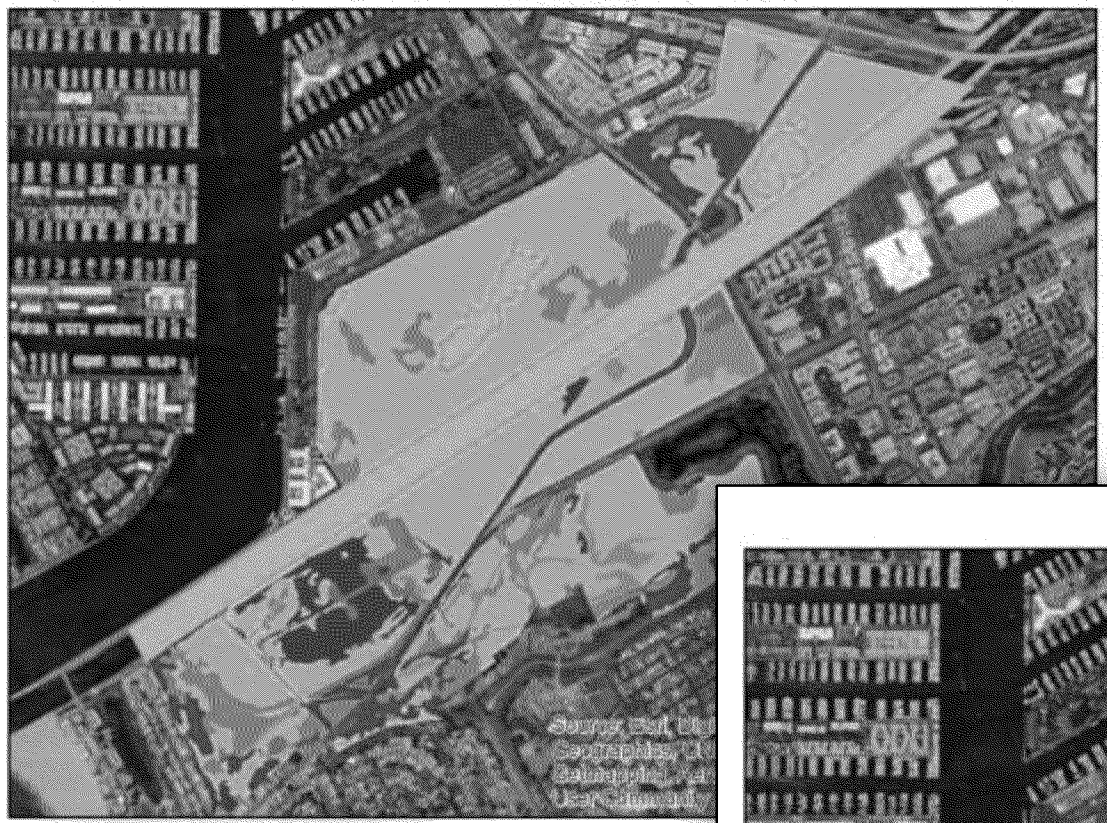


Habitat delineations based on vegetation alliances, tidal influence, and soil type

Habitat Map 2013 (TBF)

Invasion of non-native vegetation

2007



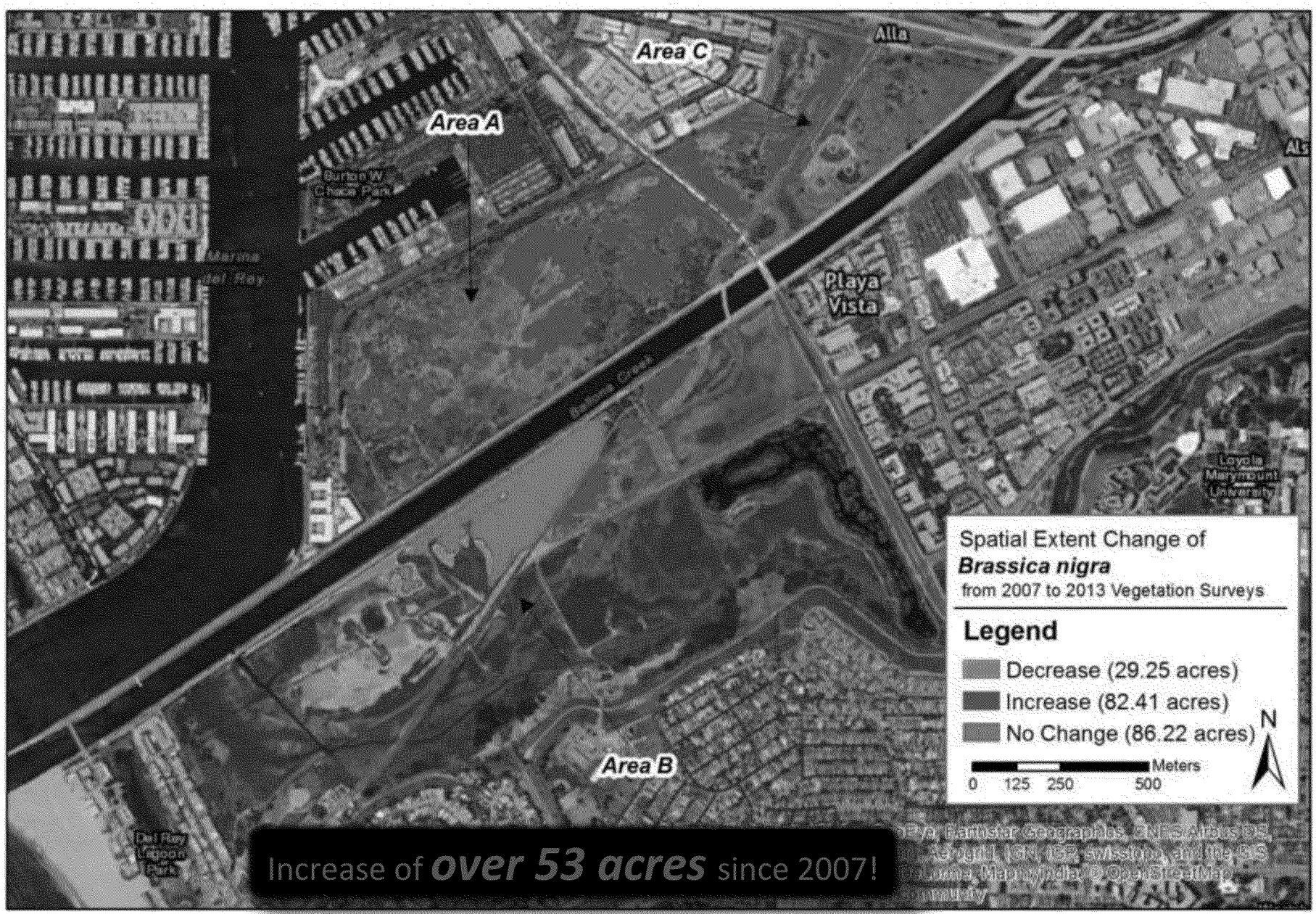
2013

Legend

- Water/ Tidal Channel

Non-native Cover (%)

- 0 %
- < 2%
- 2-9%
- 10-39%
- 40-59%
- 60-100%
- Developed/ Not Surveyed



Increase of ***over 53 acres*** since 2007!

California Rapid Assessment Method (CRAM) Survey Results

Ballona Wetlands

Area A – highly impacted

44

Area B – tide channels; muted hydrology, fewer impacts

64

Area B – seasonal wetlands; hydrological impacts

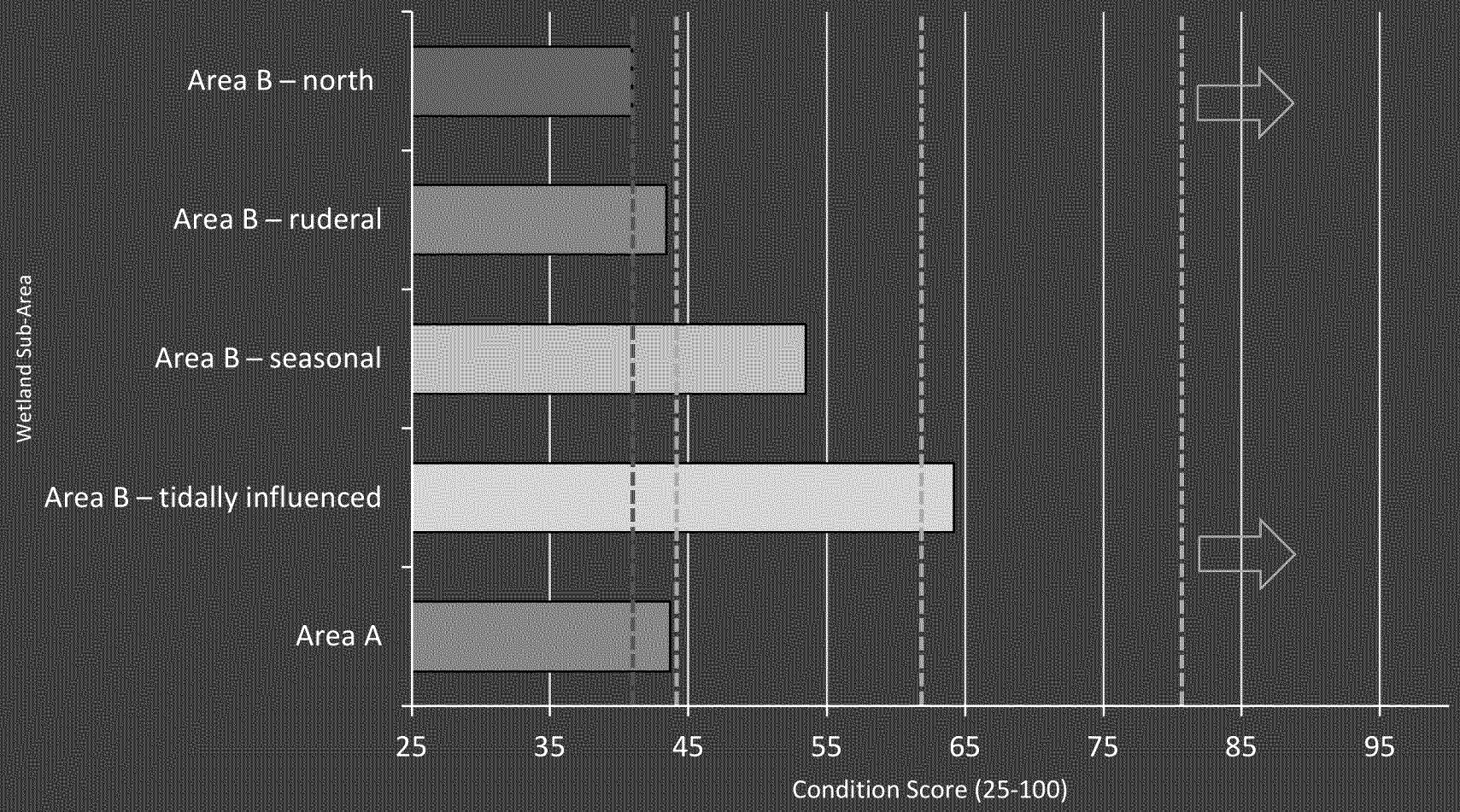
55

Carpinteria Salt Marsh

88

few impacts

Final CRAM Score by Sub-Area



What the data from Ballona tell us:

- Degraded compared to reference /more “natural” sites
  - Lower condition scores (e.g. CRAM) and species richness, though still some native vegetation
- High level of impacts over long period of time
- Several areas of the site still have predominantly native species, some areas very unhealthy
- Some limited functions persist (e.g. water filtration, carbon sequestration) and some missing completely
- High degree of human/anthropogenic impacts

Restoration Project Goals and Objectives

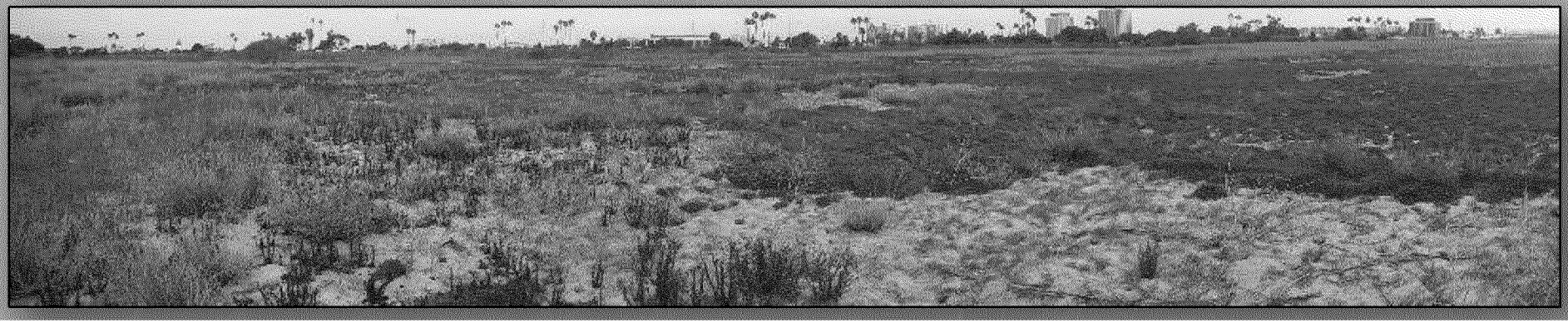
Goal 1 – Restore Ecological Functions of Wetlands:

Restore, enhance, and create estuarine and adjacent habitats in the Ballona Ecosystem to support a natural range of habitats, functions, and services, especially as related to estuarine dependent plants and animals.

Goal 2 – Benefits to the Public:

Create opportunities for aesthetic, cultural, recreation, research, and educational use of the Ballona Reserve that are compatible with area resources. Include public access and recreational use. Protect and respect cultural resources.

**** *Flood management*: maintain or increase the existing level of flood protection; protect roadways and utilities; minimize maintenance**



PROCESS

Saving the Land
- Community groups / activists
- Playa Vista sold to the state
- CDFW management

Designing the Future
- Scientists, community groups, agencies
- Dozens of workshops & meetings
- Developed potential plans and goals

Scientific Studies
- Historical ecology
- Baseline monitoring
- Research
- Mapping
- Future climate change scenarios

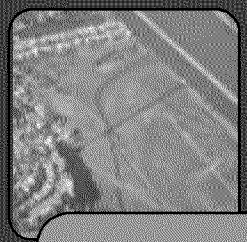
Environmental Planning
- Environmental impact reports
- Hydrology studies
- Geo tech studies
- Modelling studies
- Cultural resources
- Special status species

CEQA / NEPA
- Draft reports & documents
- Public comments
- Final reports & documents

Permitting
- Flood control permits
- Army Corps
- Coastal Commission

Construction / Restoration
- May require heavy equipment
- Reconfiguring the area based on the restoration goals and final plan
- Native species
- Public access

Long-Term Monitoring
- Determine project successes
- Feed into adaptive site management
- Ecological functions
- Citizen science



Maintaining the Land
- Weeding invasive plants
- Community groups / activists
- CDFW management

Restoration Alternatives

Alternative 1: NATURALIZED CREEK

Alternative 2: PARTIAL NATURALIZED CREEK

Alternative 3: OXBOW

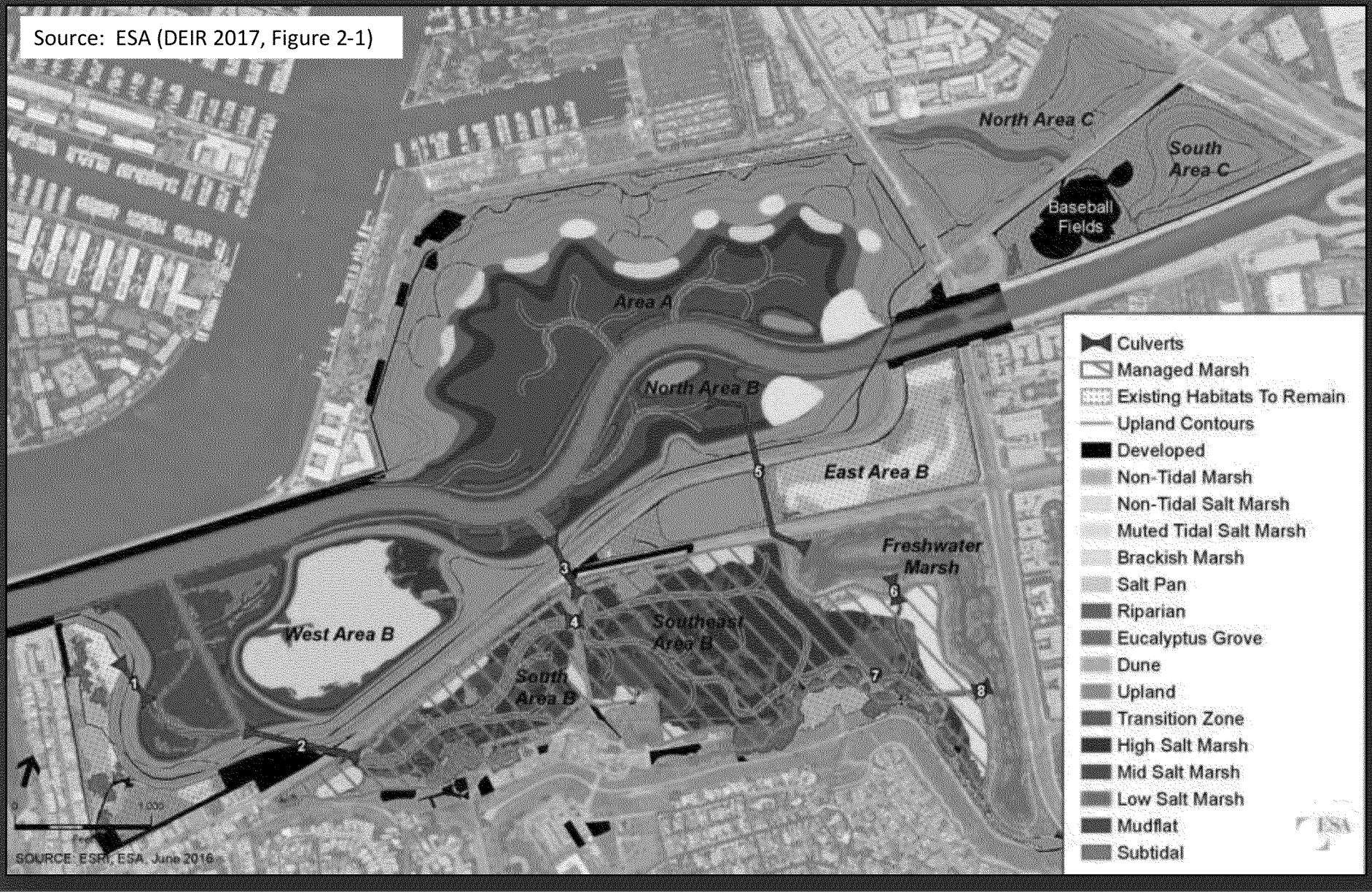
Alternative 4: NO PROJECT

State Lead Agency: CDFW
Federal Lead Agency: Army Corps

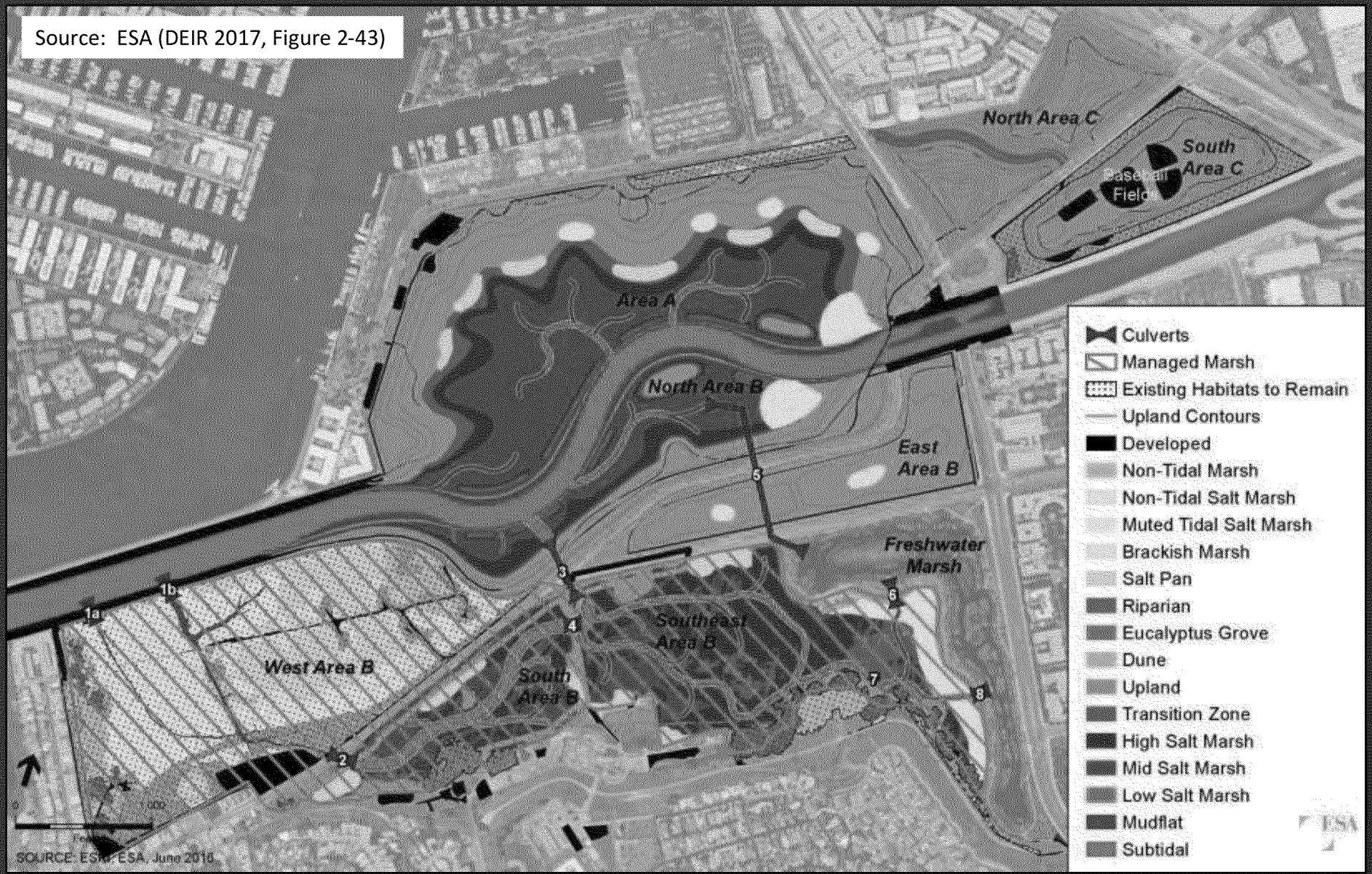
Comparing Restoration Alternatives

Alternative	Summary	Project Footprint (ac)	New or Enhanced Wetlands (ac)	New or Enhanced Waters of US (ac)	Fill Placement (cy)
EXISTING CONDITIONS	All wetlands degraded; non-native invasive species taking over site; not resilient to SLR	577	0	0	N/A
Alternative 1: NATURALIZED CREEK	Highest level of restoration; remove portion of levee and re-contour land; most resilient to SLR; new public access along trails and bike path	483	187	97	North (720K) and South (300K) Area C; off-site (110K); levees
Alternative 2: PARTIAL NATURALIZED CREEK	Remove smaller portion of levee and re-contour land; less resilient to SLR; maintains West Area B; new public access along trails and bike path	426	139	54	East Area B (340K); North (500K) and South (540K) Area C; off-site (10K); levees
Alternative 3: OXBOW	Leaves levees and existing wetlands in place, but includes new tide gates in Area A and re-contouring; new public access along trails and bike path	163	48	28	off-site (1,230K); Area A levee
Alternative 4: NO PROJECT	No restoration, no enhancement, no new public access; wetlands and other habitats will continue to degrade and have non-native vegetation invasion; not resilient to SLR	N/A	0	0	No fill moved

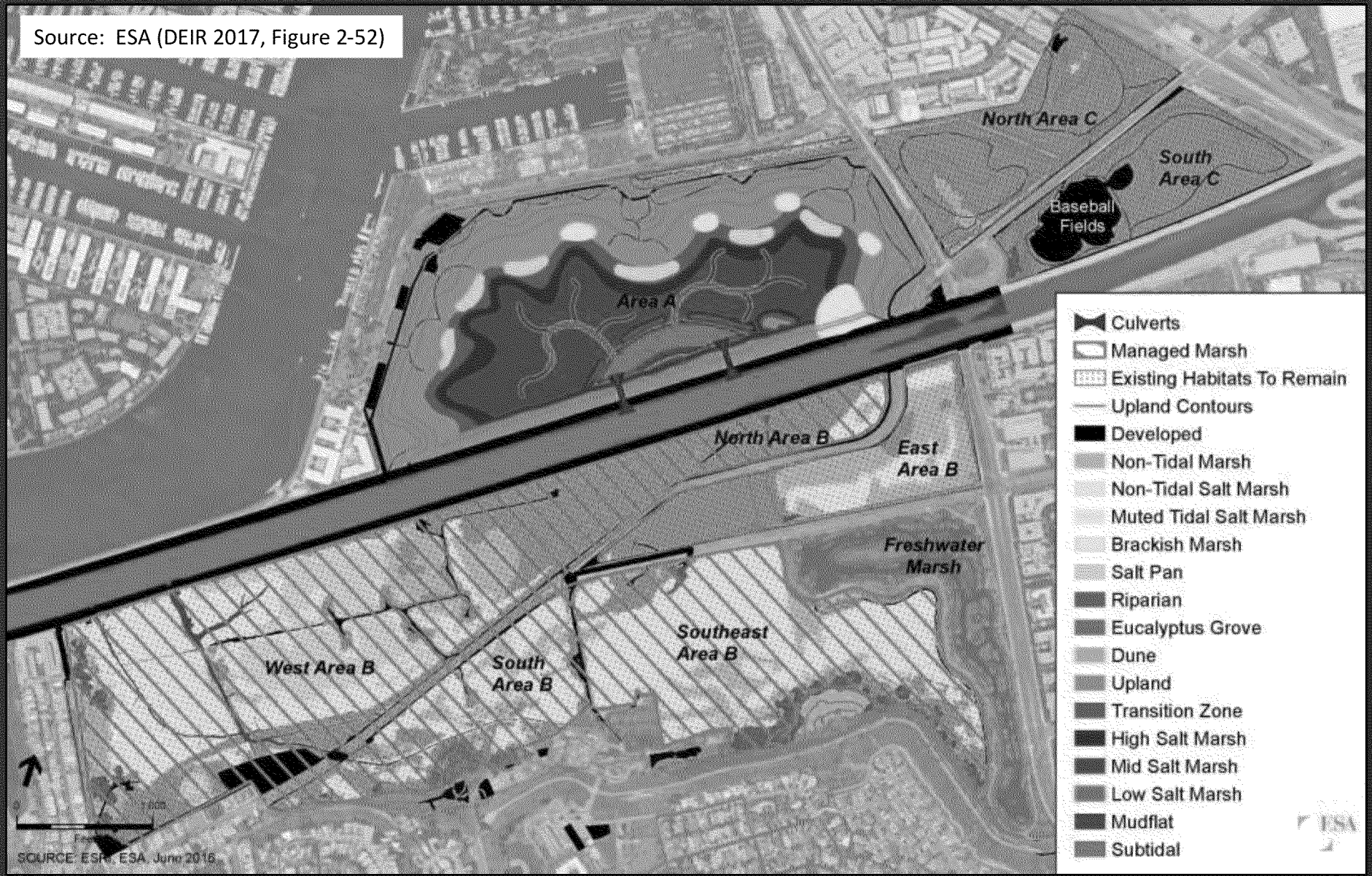
Ballona Wetlands Restoration Project
(Alternative 1 – DRAFT graphic illustration)



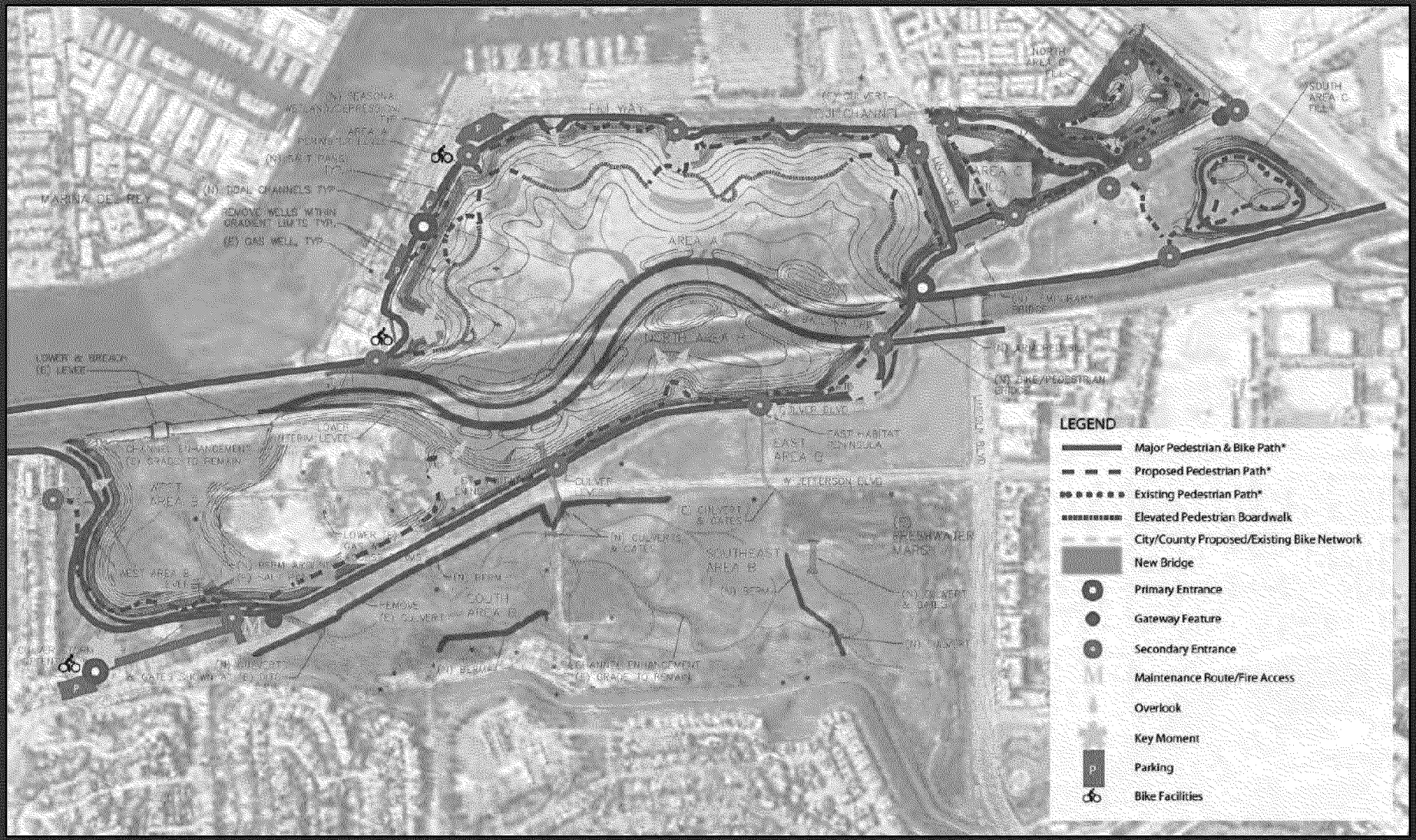
Ballona Wetlands Restoration Project
(Alternative 2 – DRAFT graphic illustration)



Ballona Wetlands Restoration Project
(Alternative 3 – DRAFT graphic illustration)

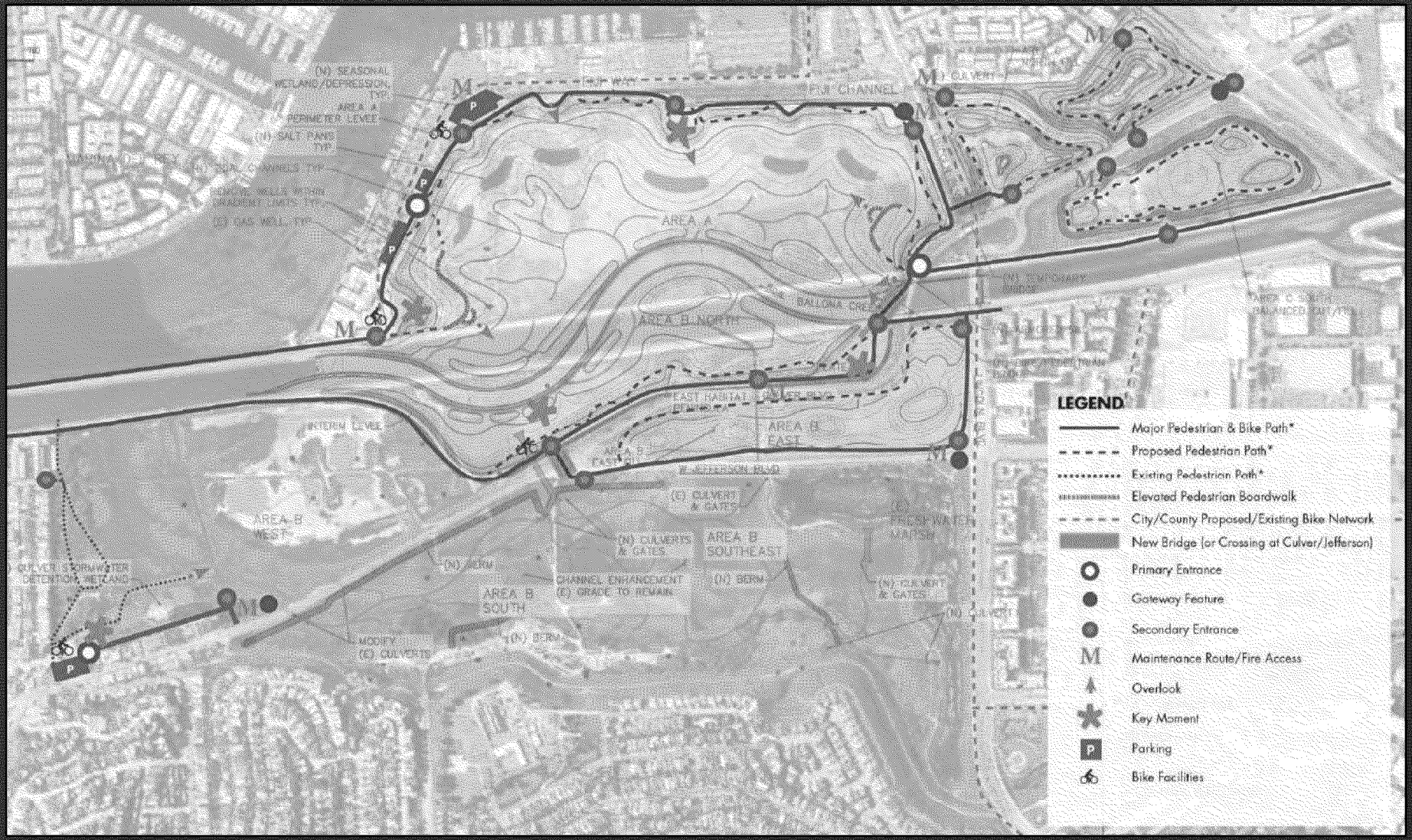


Ballona Wetlands Restoration Project
(Alternative 1 – DRAFT public access)



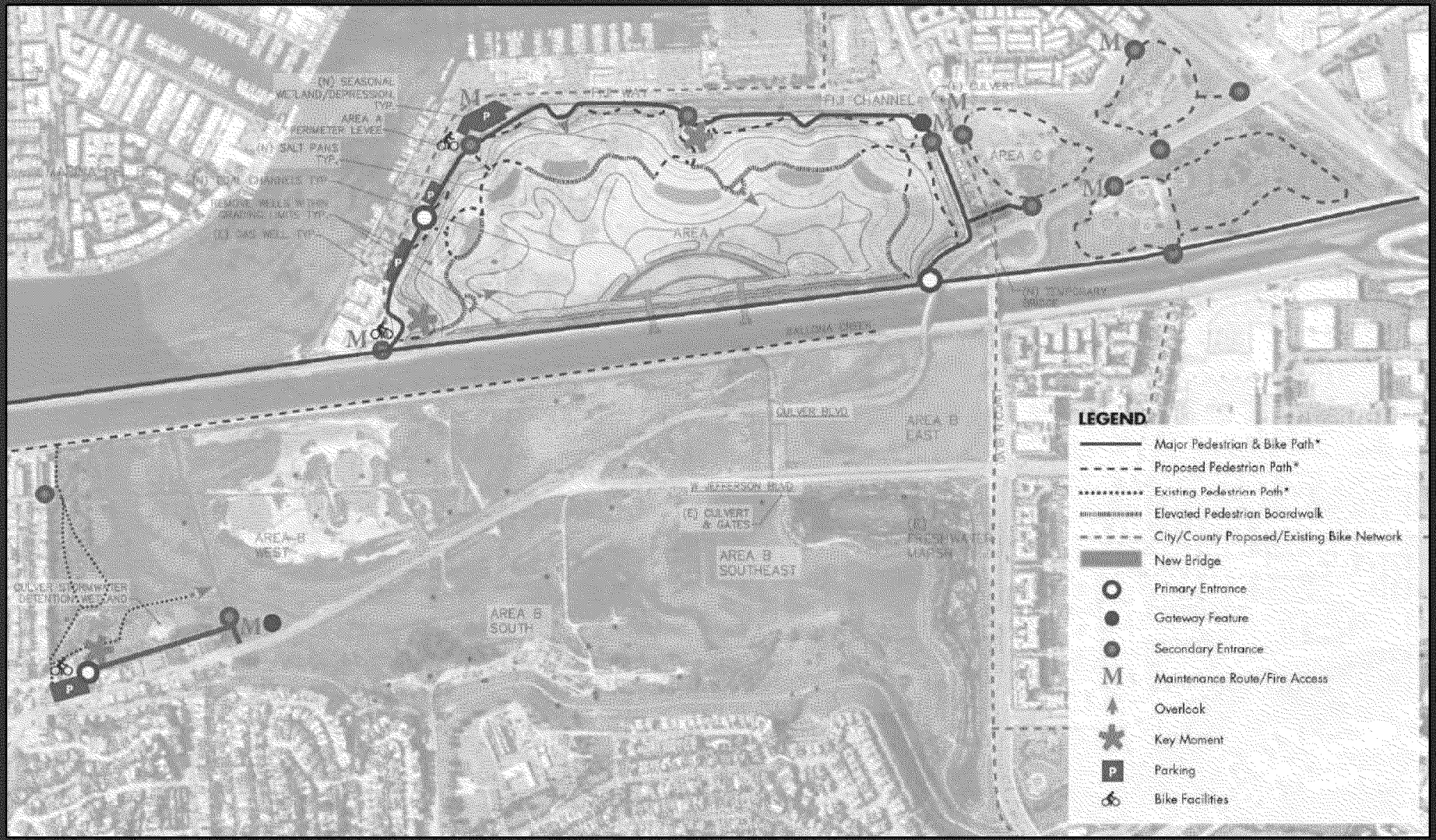
Note: paths shown are approximate
Source: Melendrez and ESA (DEIR 2017, Figure 2-23)

Ballona Wetlands Restoration Project
(Alternative 2 – DRAFT public access)



Note: paths shown are approximate
Source: Melendrez and ESA (DEIR 2017, Figure 2-45)

Ballona Wetlands Restoration Project
(Alternative 3 – DRAFT public access)



Note: paths shown are approximate
Source: Melendrez and ESA (DEIR 2017, Figure 2-54)

Get Involved!

Submit public comments to CDFW or Corps

BWERcomments@wildlife.ca.gov

https://www.wildlife.ca.gov/Regions/5/Ballona-EIR

Community Restoration Events:

Sign up here:

www.santamonicabay.org

Nov 2 (9-11:30am)

Nov 14 (9-11:30am)

QUESTIONS?

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