Cosco Busan Oil Spill NRDAR
Focus on Aramburu: The Little Island that Could

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San Francisco Bay

• Largest Estuary on the Pacific Coast of North America
• Western Hemispheric Shorebird Reserve Network *Highest* possible ranking
  – Home to close to 1 million shorebirds
• Center for Biological Diversity: Nation’s 6 most important biodiversity hotspots
  – Over 500 species of invertebrates and 500 species of vertebrates
• Diverse and rich shoreline habitat for shorebirds, waterfowl, fish, and other species
Cosco Busan Oil Spill

- November 7, 2007
  - *Cosco Busan* container ship strikes San Francisco Bay Bridge
  - Releases 53,500+ gallons of Fuel Oil
  - 3,000 birds collected, over 100 miles of shoreline oiled
Cosco Busan Oil Spill

- Majority of impacts in the Central Bay
- Oiling along outer coast from Pt Reyes in the north to Half-Moon Bay in the south
Beach Disturbance and Wrack Removal

Kirby Cove

Hot Water Washing

Albany

Vegetation Cutting and Removal

Stege Marsh

Angel Island

Manual Cleaning and Trampling
NRDA Injuries

• 6,800 birds estimated dead: 65 species
  – Primarily Diving ducks (Scaup and Scoter)
  – Cormorants, Common Murres, Grebes
  – T&E species - Snowy Plover and Marbled Murrelets also impacted

• Estimated up to ~25% of 2007-08 herring spawn lost due to egg mortality from oil exposure

• 3,300+ acres of shoreline habitat impacted

• Over 1 million user days of human recreational uses (surfing, recreational fishing, beach use etc.)
NRDA Restoration: $32.3 million

- Lost Human Uses: $18.8 Million
- Herring: $2.5 Million
- Birds: $5 Million
- Shoreline Habitats: $4 Million
- T.C. Administrative oversight: $2 Million

$13 million disbursed to date
Richardson Bay Audubon Center and Sanctuary

Center maintains 10 acres of upland habitats (with visitor center and offices)

900 Acres of subtidal bay

Aramburu is owned by Marin county and managed by RB Audubon

Sanctuary is closed to boaters (Oct-April) for protection of overwintering waterbirds
Aramburu Island Background

- 17 acre site constructed in late 1950s by the deposition of dredging spoils and upland fill.
- Sat untouched until 2011 - dominated by invasive plant species.
- Erosion rates of up to 1-6 ft per year.
- Abandoned Harbor Seal haul-out site
- Minimal shorebird foraging/roosting habitat
Aramburu Island Pre-construction Conditions:

Rapidly Eroding Shoreline

Edge of original fill placement

Island shoreline

Erosion

Erosion along island shoreline
Aramburu Island Pre-construction Conditions:

• Faux “upland” created by rocky hillslope fill
• No marsh transition zone
• Dominated by invasive vegetation

Iceplant-dominated upper marsh
Sparsely vegetated backshore flats
Aramburu Island Pre-construction Conditions:

Limited Seasonal Wetlands

Poor soil conditions for ephemeral wetlands

Limited and shallow ponding
Cosco Busan Oil Spill (2007) Bird Recovery Efforts

- Large numbers of oiled birds seek refuge at Aramburu
- Response crews captured and cleaned oiled birds
Project Development and Funding

• Project envisioned as a result of awareness of ecological utility observed during spill

• Audubon spent two years fundraising, designing, and permitting in partnership with Wetlands and Water Resources

• NRDAR Trustees became aware of project during NRDA restoration planning
Project Development and Funding

Funding Breakdown

- $1,000,000: Cosco Busan Trustee Council
- $849,000: SFB-Regional Water Quality Control Board
- $200,000: Sewer Agency - Southern Marin
- $115,000: Natl Fish and Wildlife Foundation
- $85,000: Marin Community Fund
- $47,000: National Assoc. of Counties
- $15,000: S.D. Bechtel Foundation
- $135,000: Mary Crocker Foundation
Project Goals

1. Stop erosion, increase resiliency to storm events (beach)
2. Create shoreline roosting, nesting, and foraging habitat for shorebirds and waterfowl (beach, shallow wetlands, salt flats)
3. Enhance and create marsh transition zones (high marsh)
4. Enhance habitat for existing population of rare salt marsh plants (Point Reyes Bird’s Beak) (marsh)
5. Recreate harbor seal channel and haul out site
Construction:
September 2011 - November 2012

- 90% Vegetation and topsoil seed bank scraped and buried under created wetlands
- Capped with bay mud excavated from seal channel
Seasonal wetland: Before
Seasonal wetland: After

Freshwater wetland with drainage outlet with plug for removal of salts from Bay sediments
Backshore Saline Flats: After

- Sand and oyster shell hash
- High albedo surface attracts birds
Harbor Seal Channel and Haul-out
Harbor Seal Channel
Aramburu Island Re-vegetation

- **2012-2014:**
  - Over 50,000 native plants installed
  - 9 acres seeded

- **Future Work:**
  - Plant propagation in Audubon nursery
  - Winter 2014-15 planting
  - Invasive vegetation management
  - Biological monitoring through 2017
Current Conditions:
Increased Resiliency & New Habitat

- Erosion problems eliminated
- Improved flood/storm attenuation
- Demonstration site for other “green” shoreline protection projects
- 13 acres of new habitat
- Immediate wildlife response
Wildlife Response

- Birds with no prior habitat arrive
- Use by Caspian, Forster’s and Elegant Terns for roosting and mating
- Groups of up to 400 at a time.
Wildlife Response

First time Black Oystercatchers nest in Richardson Bay

- One of only 4 nesting sites in SF Bay
- Focal Species, FWS
- Species of Special Concern, Audubon
- Vulnerable to:
  - Sea level rise
  - Ocean acidification
  - Increased recreational and commercial use of coastal areas.
Community Involvement

Local volunteers/school groups critical in invasive plant removal, shoreline maintenance, and biological monitoring.
QUESTIONS?