

Presented by: Chris Redfern, Executive Director of San Diego Audubon

Presented to: SANDAG TransNet EMP

January 26, 2013

Mission Bay Park Conservation Program:

Habitat Assessment, Invasive Control,
and Community-Based Habitat
Restoration



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Presentation Outline

- Introduction to San Diego Audubon Society (SDAS)
- Mission Bay Park IBA
- California Least Tern and Nuttall's Lotus
- Project Tasks & Progress
- Preliminary Results
- Questions



California Least Tern. Photo: W. Dalton



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

SDAS Mission and Vision

- Foster the protection and appreciation of birds, other wildlife, and their habitats
- Inspire a culture of conservation where people appreciate, understand, and actively protect the natural world



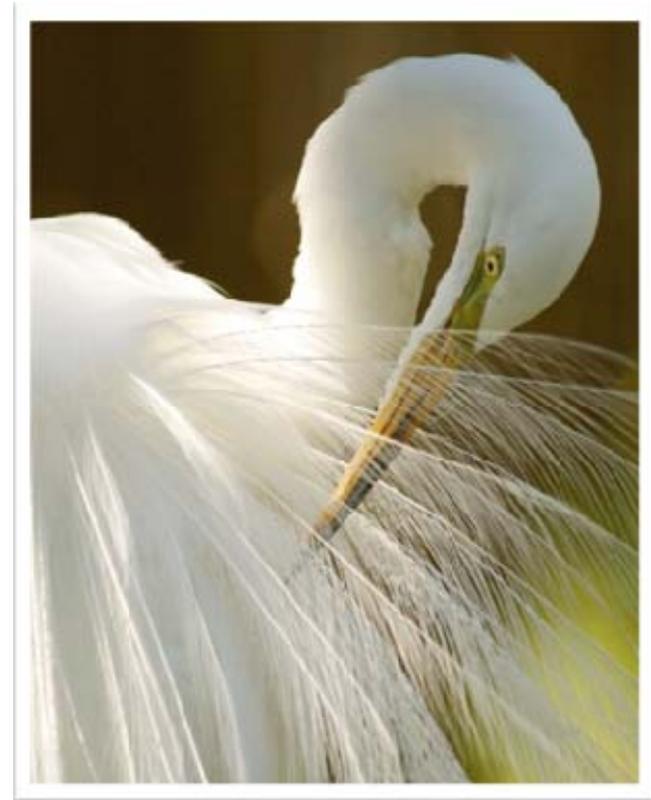
Black and White Warbler. Photo: K. Strauss



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Introduction to SDAS

- Chapter of National Audubon Society
- Founded 1948
- Serves diverse population
- Programs include Conservation, Education, Outreach, Sanctuaries



Great Egret. Photo: K. Strauss



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Programs

- Sanctuaries: Anstine (11 acres); Silverwood (757 acres)
- Education: OutdoorExplore! nature education program introduces more than 1,000 elementary school children to neighborhood natural places each year. Silverwood 4th Grade Science Discovery Program will serve 850 children.
- Outreach: Over fifty guided walks, sanctuary workshops, San Diego Bird Festival.
- Conservation: 25 restoration events, >3,000 volunteer hours



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Mission Bay – 1928 and 1948



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Mission Bay Park IBA



Mission Bay Park IBA

- Important Bird Area
- Historically >1% global pop. CA Least Terns
- >5,000 migratory water/shorebirds
- 9 sensitive bird species
- Multiple habitats:
 - Eel grass, alkali flats, sandy shoreline, salt marsh



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

California Least Tern (LETE)

- *Sterna antillarum browni*
- Small, grey, migratory shorebird
- Winter: Central America
Nest: CA Coast
- Forage for anchovies in lagoons, offshore water
- Foraging time = highly sensitive to predation



California Least Tern, with eggs. Photo: N. Johnston



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

LETE Nesting Habitat

- Ground-nesting birds
- Coastal dune/strand nesting habitat
- Prefer <30% vegetation cover, <10cm high
- Habitat loss, fragmentation, invasive species



California Least Tern. Photo: J. Oldenettel



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

LETE Conservation Status

- State and federally-listed endangered (1970)
- Covered by MSCP/MHCP
- Nesting pairs/fledges:
 - 2000-2004: 400/125
 - 2005-2009: 200/14
- Human disturbance, vegetation cover change, predation, food availability



California Least Tern feeding chick. Photo: S. Nelson-Embry



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Nuttall's Lotus (NULO)

- *Lotus nuttallianus*
- Populations at Camp Pendleton, coastal lagoons, Mission Bay, D Street, Silver Strand, Border Field
- Threats: Loss of habitat from development, trampling, invasive plants, land management activities, and edge effects



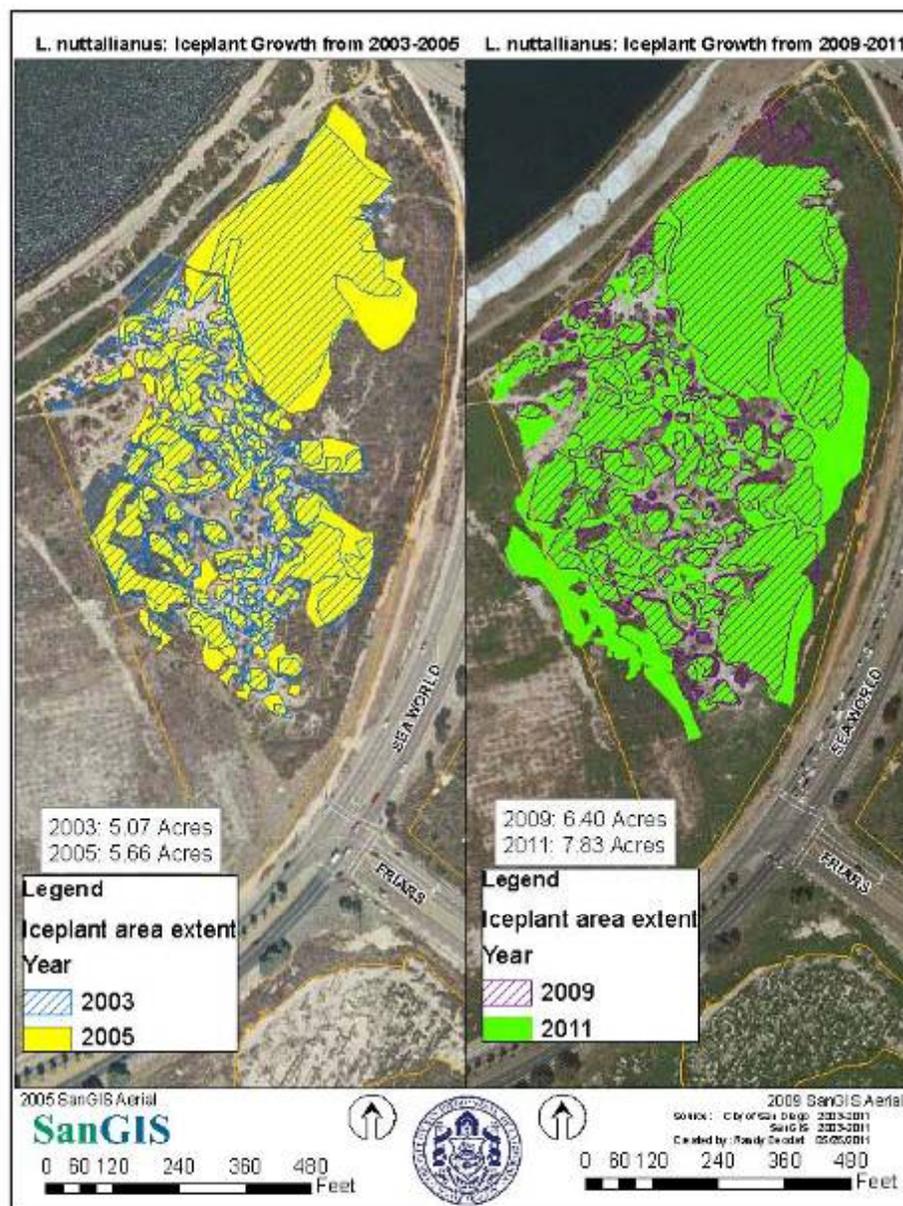
Nuttall's Lotus. Photo: L. Hedlund



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

NULO in Mission Bay Park

- Total invasive species cover at South Shores has increased from 37% in 2006 to 93% in 2011



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Transnet EMP Project

Three tasks:

1. Mission Bay Habitat Assessment and Conservation Action Plan
2. Pre-Project Monitoring
3. Restoration and enhancement of priority coastal dune habitats in Mission Bay Park

Project No. 12009 Project Name: Mission Bay Park

**EXHIBIT A
SCOPE OF WORK**

Brief Project Summary

Grantee shall implement an invasive control and habitat restoration project to benefit coastal dune habitat in Mission Bay Park. Through a habitat evaluation program called Important Bird Area (IBA) Assessment, Grantee will collaborate with relevant stakeholder groups including SDG&S and National Wildlife Agencies, land managers and owners, and other organizations, to establish a baseline for habitat health in Mission Bay Park. Grantee will guide Contractor's efforts to maintain, restore, and protect the Park's specific habitats and wildlife. The end product of this planning activity will be a Mission Bay Conceptual Conservation Action Plan for the locations in the park. Contractor and consultant will prepare a Conceptual Conservation Action Plan, and Site Visit Report, and other related information with local SDG&S and the Institute for

Task 1. Mission Bay Habitat Assessment

Stakeholders, including the California Fish & Game, AGS, and others, will be consulted regarding the project. The project will be completed within the next 12 months. The project will be completed within the next 12 months. The project will be completed within the next 12 months.

Project No. 12009 Project Name: Mission Bay Park

Section 21. Notice

Any notice or instrument required to be given or delivered by this Agreement may be given or delivered by depositing the same in any United States Post Office, registered or certified, postage prepaid, addressed to:

San Diego Association of Governments
4615 Street 2
San Diego, CA 92161-0001

San Diego Audubon Society
San Diego, CA
Attn: Chris Bay

and shall be of

Section 22. It

The individual and authority

IN WITNESS WHEREOF

SAN DIEGO ASSOCIATION OF GOVERNMENTS
Chris Bay
Executive Director

APPROVED AT:

Chris Bay
Executive Director

Resolved ENVIRONMENTAL MITIGATION PROGRAM FISCAL YEAR 2011

**GRANT AGREEMENT SOCIETY RESTORATION
THE SAN DIEGO ASSOCIATION OF GOVERNMENTS
AND
SAN DIEGO AUDUBON SOCIETY
REGARDING MISSION BAY PARK**

This GRANT AGREEMENT SOCIETY RESTORATION is made this 11th day of April, 2011, by and between the San Diego Association of Governments (hereinafter referred to as "SANDAG"), 4615 Street, Suite 201, San Diego, CA, and San Diego Audubon Society (hereinafter referred to as "Grantee"), 4615 Mission Boulevard, Suite 100, San Diego, CA.

RECITALS

The following recitals are a substantive part of this Agreement:

- In November 2006, the voters of San Diego County approved SANDAG Ordinance 84-01, which extended the Transfer Tax and the State Tax through 2048 (Transfer Ordinance).
- The Transfer Ordinance contains provisions for the creation of an Environmental Mitigation Program (EMP), which began being funded by the Transfer Ordinance on April 1, 2008.
- In March 2011, SANDAG issued a request for proposals from entities wishing to apply for a portion of the EMP funds for use on environmental land management projects meeting certain criteria.
- Grantee successfully applied for EMP funds for the following project: Mission Bay Park (hereinafter referred to as the "Project").
- The purpose of this Agreement is to establish the terms and conditions for SANDAG to provide Grantee with funding to implement the Project (Transfer Ordinance Assistance).
- Although SANDAG will be providing financial assistance to Grantee to support the Project, SANDAG will not take an active role in managing the Project or retain substantial control over any portion of the Project.

NOW, THEREFORE, it is agreed as follows:

Section 1. Definitions

- Application** means the signed and dated grant application, including any assessment reports, with all supporting, supporting, and supplementary documents that with SANDAG by or on behalf of the Grantee and accepted or approved by SANDAG. All of Grantee's application materials, not in conflict with this Agreement, are hereby incorporated into this Agreement as though fully set forth herein.



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 1 Goals

“Mission Bay Habitat Assessment and Conservation Action Plan”

- Bring together multiple stakeholders
- Conduct habitat assessment leading to action plan for target species/habitats in Mission Bay Park
- *Open Standards for the Practice of Conservation*



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 1 Goals

“Mission Bay Habitat Assessment and Conservation Action Plan”

Audubon California

California Department of Fish and Game

California Native Plant Society

City of San Diego—Open Space Division

City of San Diego—Parks & Recreation

Friends of Famosa Slough

San Diego Audubon Society

San Diego Management and Monitoring Program

San Diego River Park Foundation

SeaWorld San Diego

UC Natural Reserve System

US Fish and Wildlife Service



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 1 Results

“Mission Bay Habitat Assessment and Conservation Action Plan”

- Two planning workshops (August, December 2011)
- Chose targets for Mission Bay IBA
- Identified Key Ecological Attributes to track health of each target
- Evaluate conservation strategies
- Identified priority monitoring needs and on-the-ground conservation projects



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 1 Results

“Mission Bay Habitat Assessment and Conservation Action Plan”



Light-footed Clapper Rail



Nuttall's Lotus



California Least Tern



Salt marsh



Migratory shorebirds



Coastal dunes



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 1 Results

“Mission Bay Habitat Assessment and Conservation Action Plan”

- Groups met July 2012 through January 2013 to assess KEAs, identify goals
- Results currently being synthesized into an action plan (February 2013)



Light Footed Clapper Rail. Photo: M. Stinnett



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 1 Results

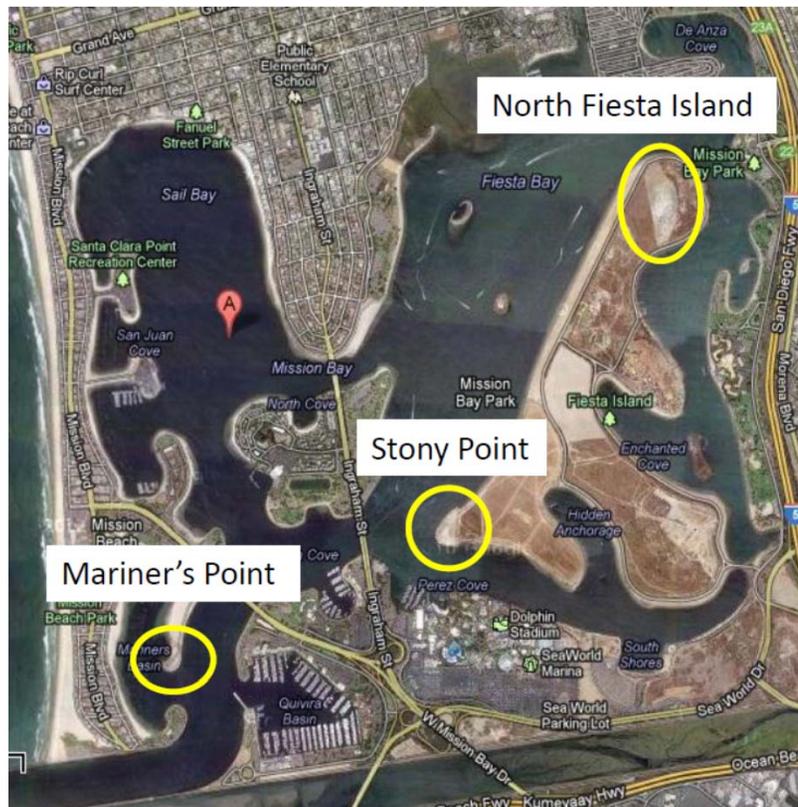
KEY ECOLOGICAL ATTRIBUTE(S)	INDICATOR(S) OF KEA	DATA SOURCE
Species composition	Number of nesting pairs	CA Dept of Fish and Wildlife
	Number of fledglings	CA Dept of Fish and Wildlife
	Number of fledgling/nesting pair ratio	CA Dept of Fish and Wildlife
Lack of excessive depredation	Number of predator observations/hour	Citizen Science Project
	Percent of nests abandoned	USDA Predator Reports/CDFW
	Percent of eggs depredated	USDA Predator Reports/CDFW
	Percent of chicks depredated	USDA Predator Reports/CDFW
	Percent of fledges depredated	USDA Predator Reports/CDFW
Food availability	Nest Attendance	Citizen Science Project
Suitable nesting habitat	Vegetation height	Transnet EMP (through 2014)
	Vegetation percent cover	Transnet EMP (through 2014)
	Percent native vs. non-native vegetation	Transnet EMP (through 2014)
	Sand/soil characterization	Transnet EMP (through 2014)



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 2 Goals

“Pre-project Monitoring”



- Develop monitoring protocols with SDSU IEMM (Catherine Tredick)
- Citizen science program
- Establish baseline conditions for assessment



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 2 Results

LETE Adaptive Management - Goals

1. Increase LETÉ nesting activity and productivity at selected nesting sites in Mission Bay Park
2. Manage LETÉ nesting sites in a manner that improves their ecosystem value to multiple native plant and animal species



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 2 Results

“Pre-project Monitoring”

Primary Research Question:

- Will restoring coastal dune habitat at LETE nesting sites in Mission Bay Park result in increased nesting activity and productivity of LETEs?



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 2 Results

“Pre-project Monitoring”

Secondary Research Questions:

- Which alt. vegetation management options are most effective in establishing coastal dune habitat and minimizing the presence of invasive species?
- How do alt. management options compare to status quo vegetation treatment in providing appropriate vegetation cover for LETE nesting?



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

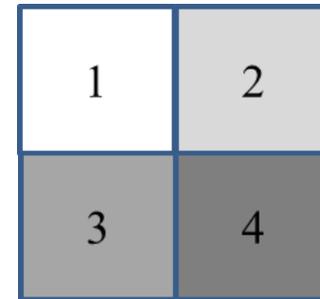
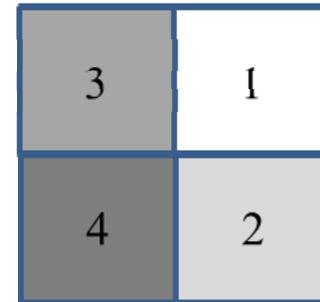
Project Details: Task 2 Results

“Pre-project Monitoring”

4 treatment options at Stony Point and North Fiesta Island:

1. Do nothing
2. Amend with sand
3. Amend with seed
4. Amend with sand and seed

20 m
or
10 m



Plots for treatment options.



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 2 Results

“Pre-project Monitoring”



*Volunteers removing invasive plants and delineating test plots.
Photo: D. Heckman. March 12, 2012. Mariner's Point*

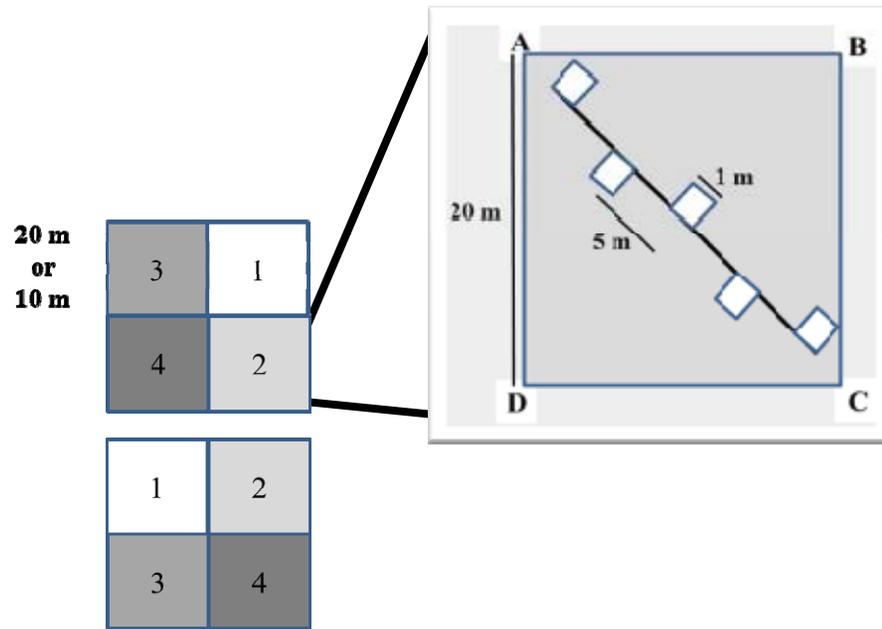
- Implemented vegetation monitoring protocol at 3 LETE sites:
 - Mariner's Point
 - Stony Point
 - North Fiesta Island
- 49 volunteers
- Implemented photo monitoring program



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 2 Results

“Pre-project Monitoring”



Schematic of vegetation monitoring plots.

Monitoring protocol details:

- Combined Transect-Quadrat method
- 16 management plots at each site
- 4 transects per plot
- Spring and Fall
- Recorded: % veg cover, veg height, species present, ground cover



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 3 Goals

“Restoration and enhancement of coastal dune habitats in MBP”

Three components:

- Invasive Plant Control
 - Large scale removal, herbicide application at South Shores
 - 14 acres of invasives to be removed from priority habitats
- 30 Community-based habitat restoration events
 - Hand-removal, native re-vegetation, protective fencing
- Post-project monitoring
 - LETE reproductive success, % cover native plants, acreage cleared of invasives



Volunteers clearing coastal dune habitat. Photo: SDAS



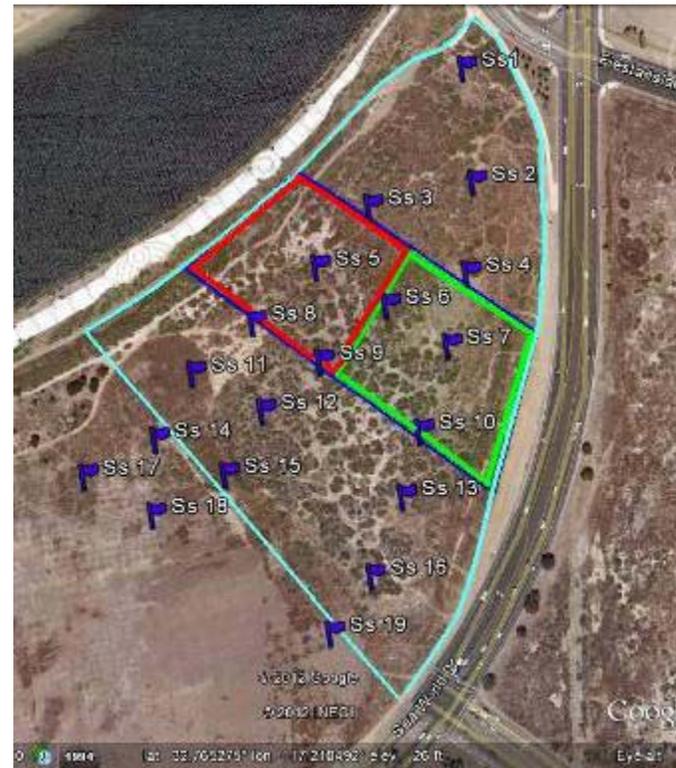
Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 3 Results

“Restoration and enhancement of coastal dune habitats in MBP”

Invasive Plant Control:

- Herbicide applied to 2.5 acres by M. Kelly (of Kelly and Associates)
- Testing iceplant removal techniques at South Shores (green versus dead/dried, mechanized removal)
- 70 volunteers



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 3 Results

“Restoration and enhancement of coastal dune habitats in MBP”

Community Based Habitat
Restoration:

- Photo monitoring:
 - Volunteer training
 - Implemented at South Shores



Above: Volunteers learn photo monitoring techniques.

Below: An example photo from monitoring efforts.

Photos: SDAS



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 3 Results

“Restoration and enhancement of coastal dune habitats in MBP”

Community Based Habitat Restoration:

- Work events at 3 LETE sites in Mission Bay
- Since April 2012:
 - 6 events
 - 164 volunteers, 65 new
 - 545 volunteer hours
- 8 events scheduled through April 15



*Volunteers remove filaree from Mariner's Point.
Photo: R. Schwartz*



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Project Details: Task 3 Results

“Restoration and enhancement of coastal dune habitats in MBP”

Post Project Monitoring:

- Vegetation monitoring completed Fall 2012
- Looked for changes in veg. characteristics through nesting season

The table displays a comprehensive set of vegetation monitoring data, including species names, counts, and various metrics across multiple sites and dates. The data is presented in a grid format with numerous columns and rows.

Example of vegetation monitoring data.



Fostering the protection and appreciation of birds, other wildlife, and their habitats...

Acknowledgements

- Partners at SDSU: Dr. Rebecca Lewison, Dr. Doug Deutschman, Dr. Catherine Tredick, Dr. Richard Hillary, Spring Strom, Julie Jesu
- Matching funds sponsors: SeaWorld, National Audubon Society, National Science Foundation
- Photo monitoring: Phil Roullard, Dana White
- Herbicide: Mike Kelly
- City of San Diego: Betsy Miller, Lori Gerbac, Stephanie Ferris
- Amazing volunteers: Students from Dr. April Maskiewicz's class at PLNU and students from Dr. Deutschman's BIO 535 class at SDSU.



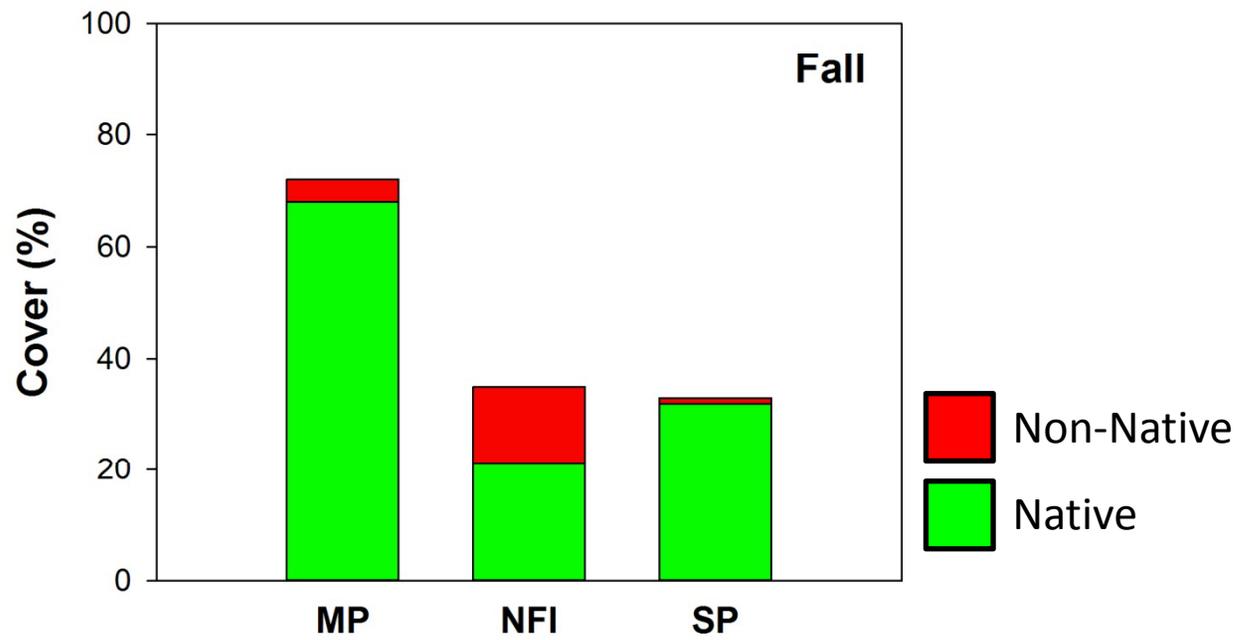
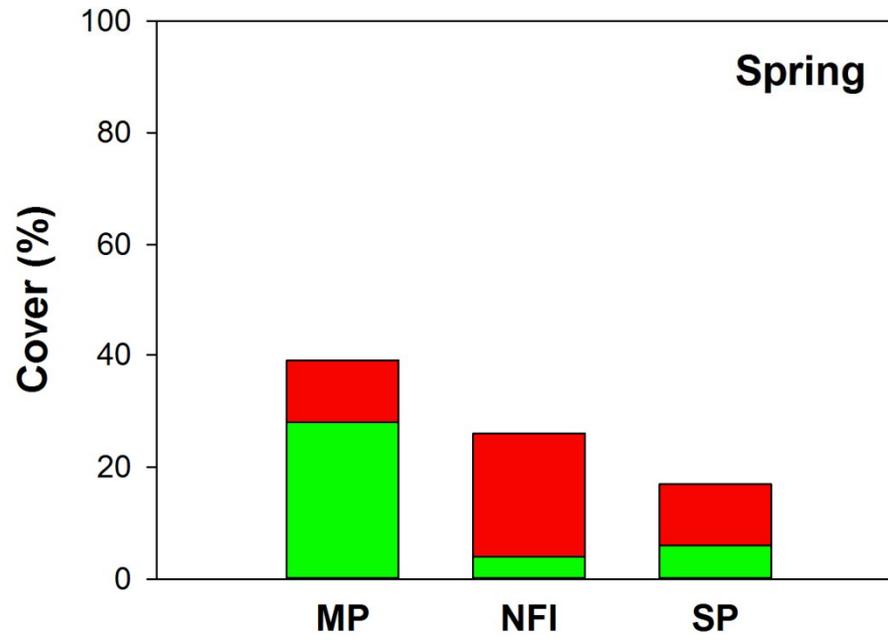
CLTE vegetation monitoring in Mission Bay: Preliminary results

Julia Jesu

MS student, Deutschman Lab
San Diego State University
juljesu@gmail.com

Three Sites throughout Mission Bay



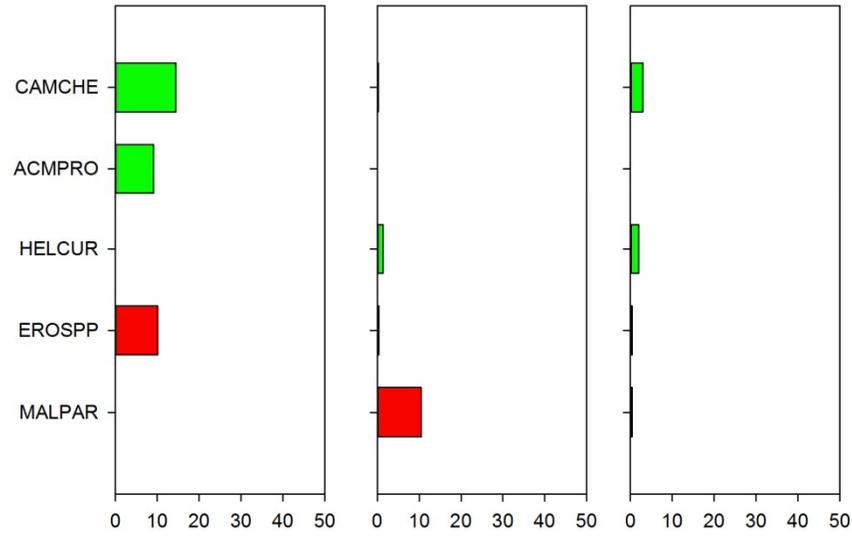


Mariner's Point

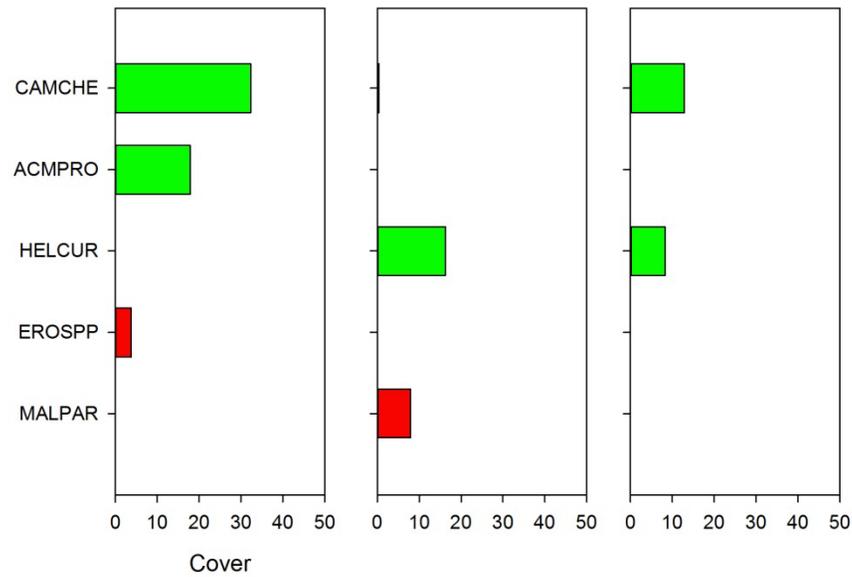
North Fiesta

Stony Point

Spring



Fall



Cover

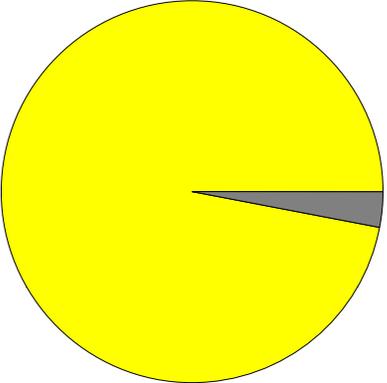
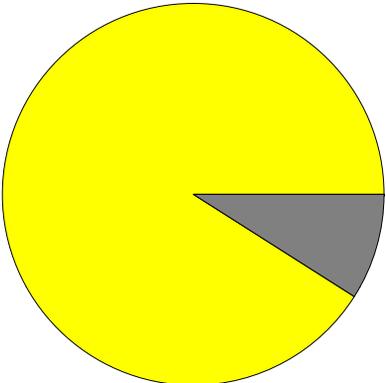
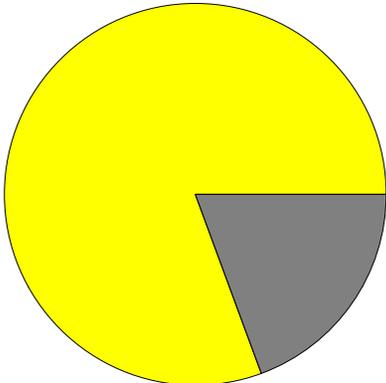
Ground Cover

Mariner's Point

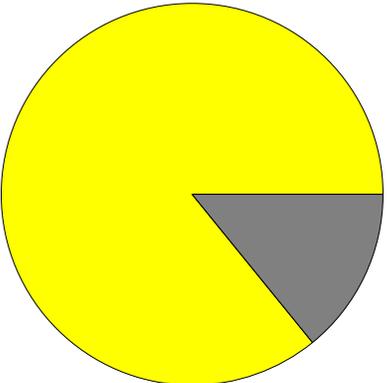
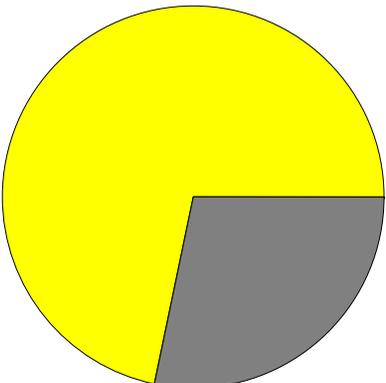
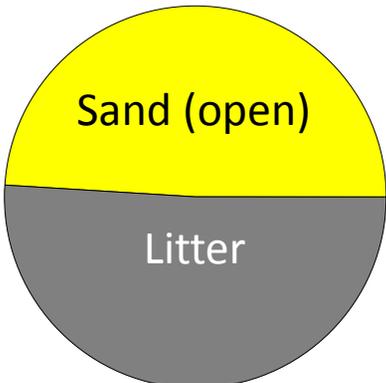
North Fiesta

Stony Point

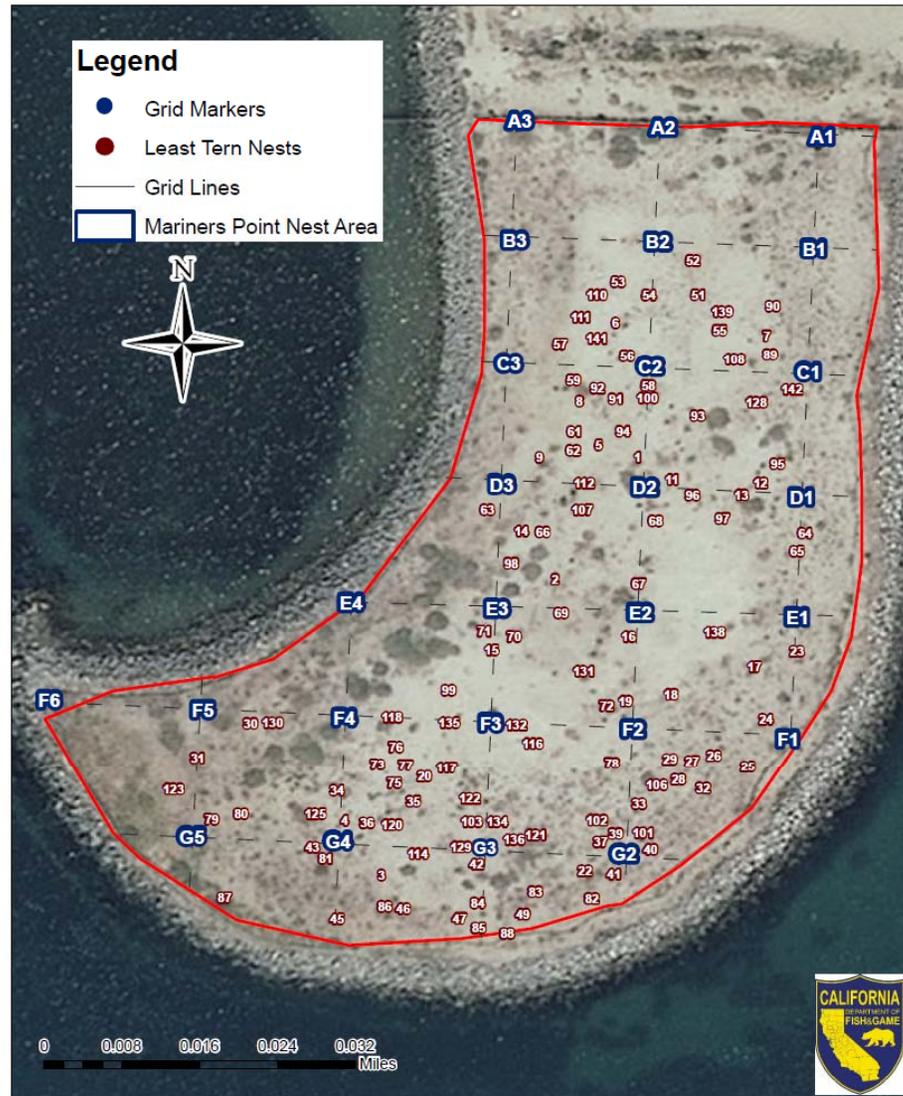
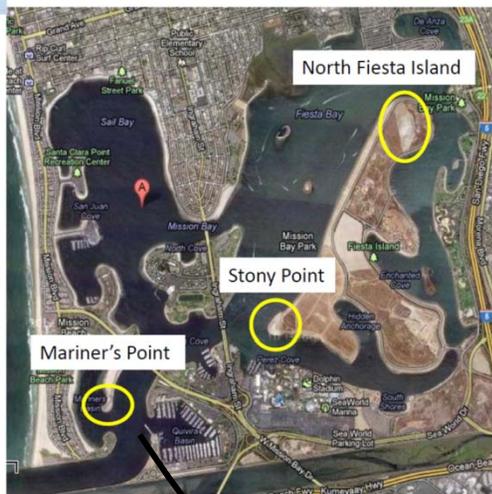
Spring
2012



Fall
2012

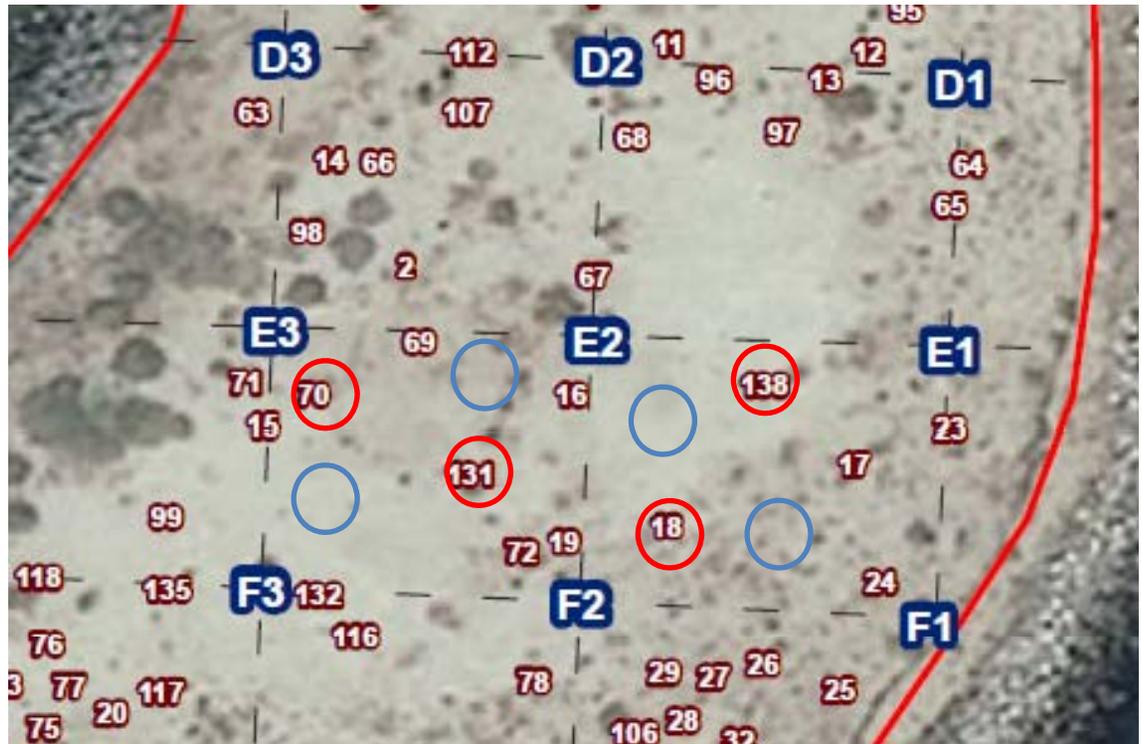


Nest-Based Vegetation Monitoring at Mariner's Point



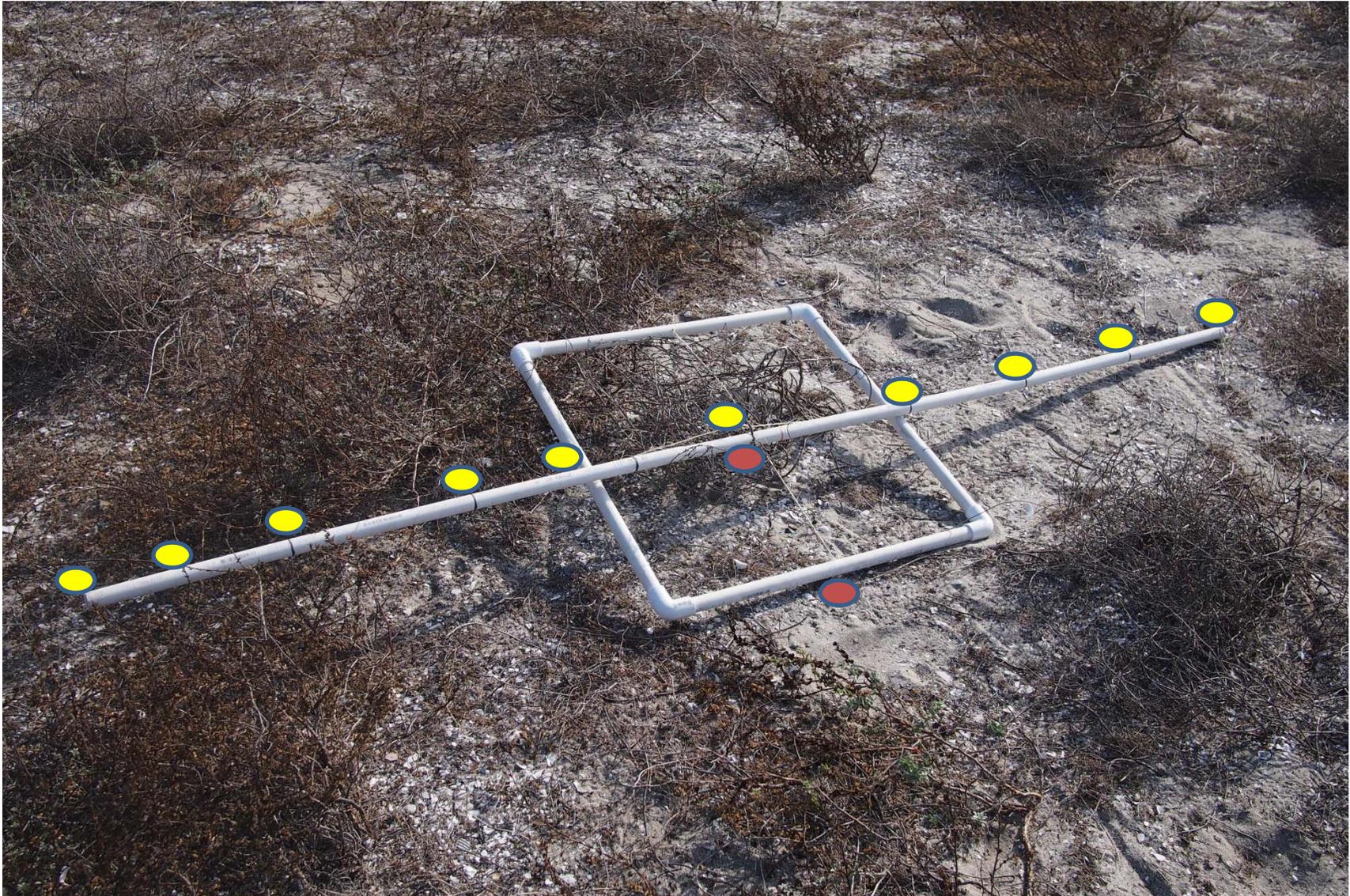
A paired design

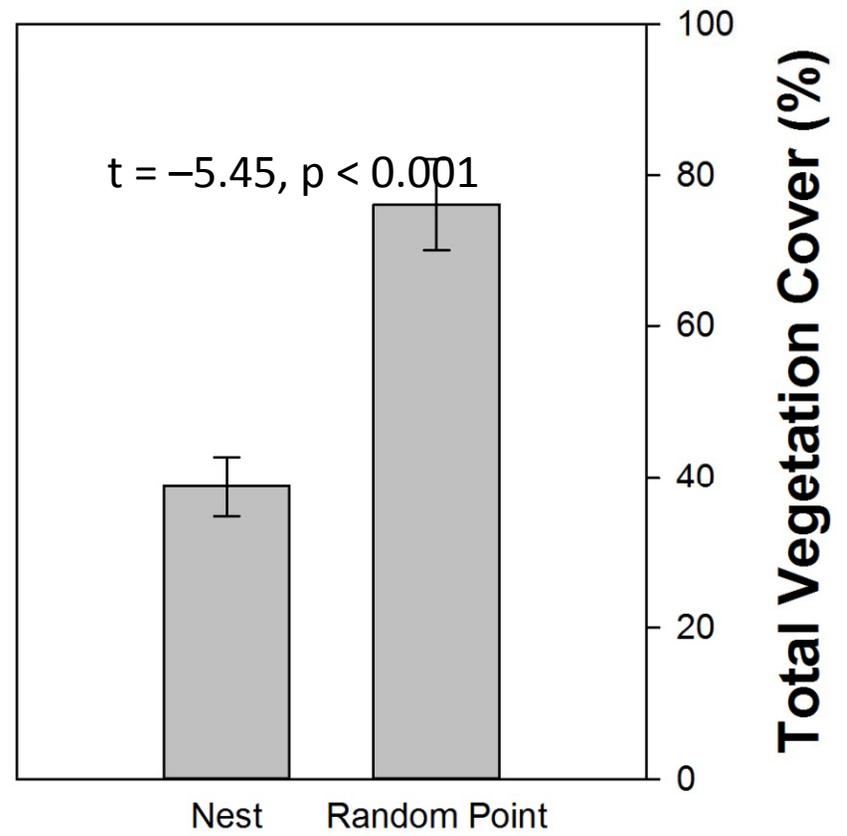
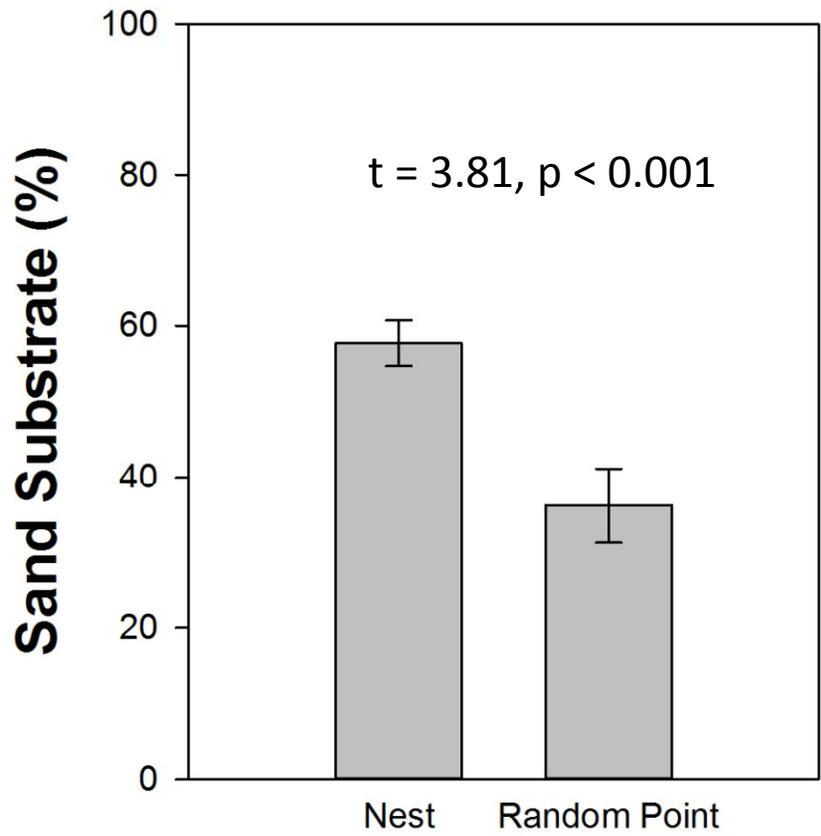
- Two nests were randomly chosen in each grid square ○
- Two unoccupied (non-nest) areas were chosen in each grid square ○



- Each nest is therefore “paired” with an unoccupied spot
- Both are sampled

An example from an unoccupied
(non-nest) point:





Vegetation height

