Invasive Species Management in Sensitive Coastal Foredune Habitat

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THE LAND CONSERVANCY of san luis obispo county

The Land Conservancy of San Luis Obispo County

Nonprofit land trust

Established in 1984

67,000+ acres permanently protected

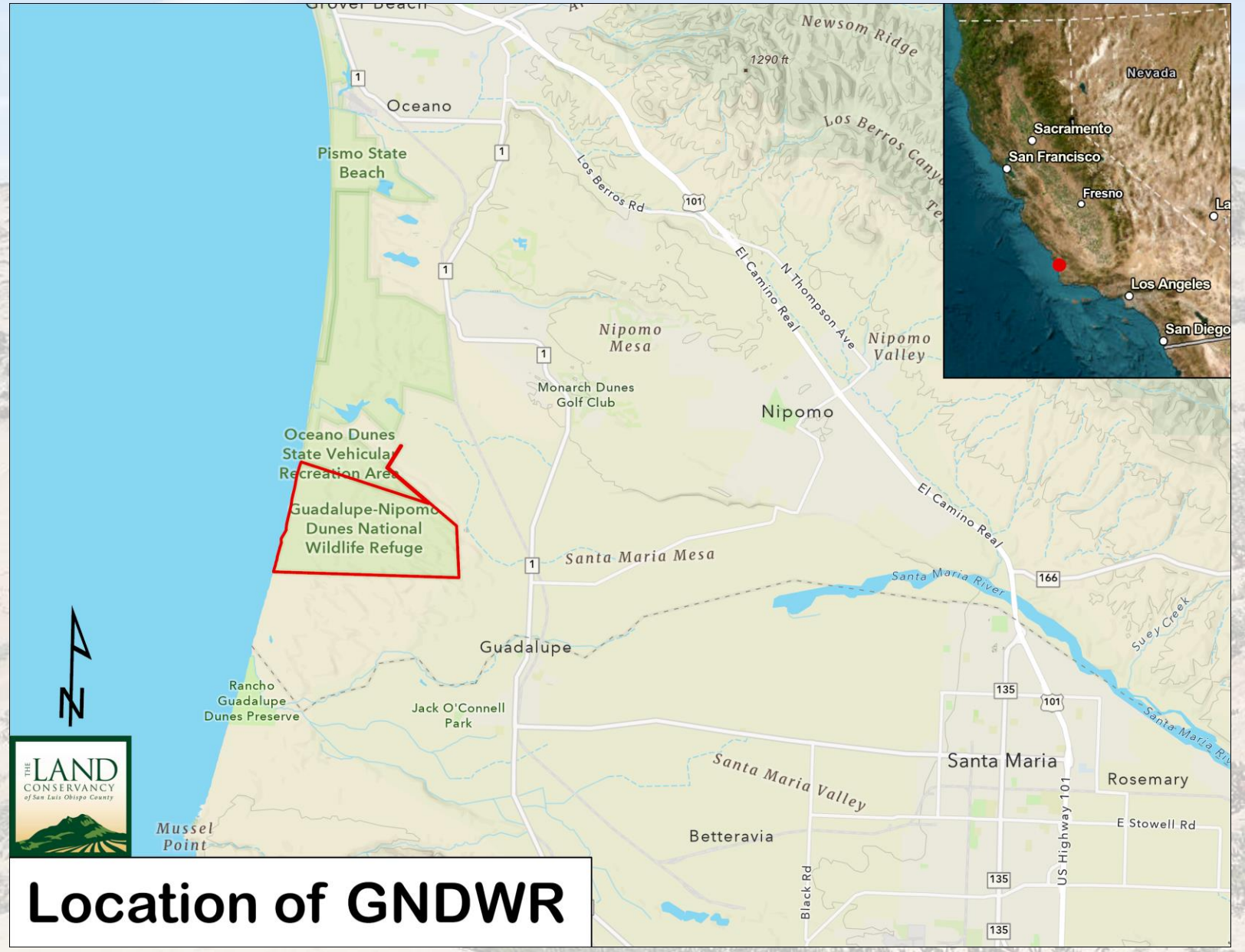
- Fee Property Ownership & Management (4,700 acres, 17 properties)
- Conservation Easements w/ Private Landowners (63,000 acres, 50 easements)

Guadalupe-Nipomo Dunes Complex

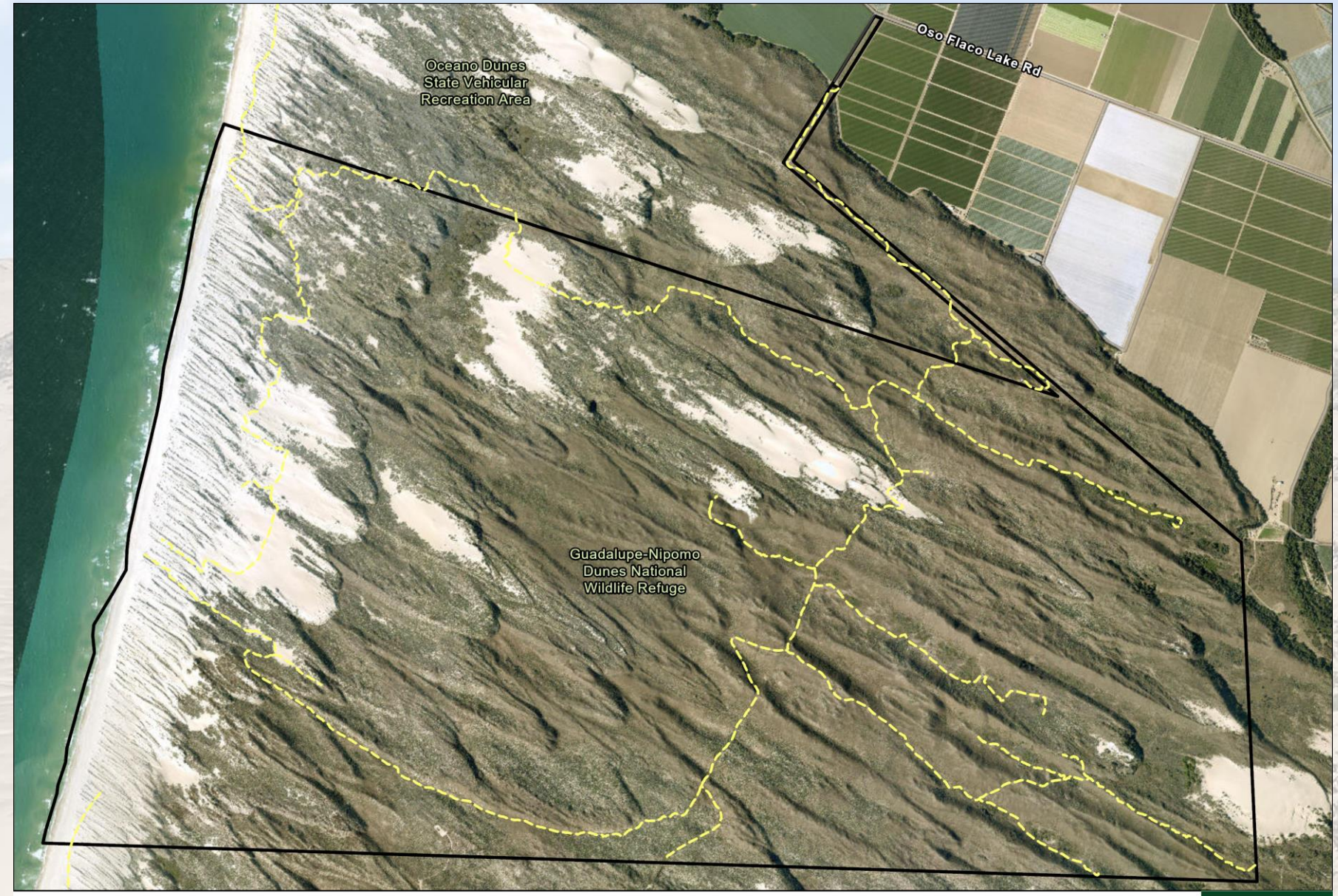
- San Luis Obispo & Santa Barbara County
- 11 miles of coastline
- 20,000 acres

Guadalupe-Nipomo National Wildlife Refuge

- 2,553 acres established in 2000
- Ventura Office of U.S. Fish and Wildlife Service
- Created for the protection of rare habitat types and species



Location of GNDWR



Guadalupe-Nipomo Dunes National Wildlife Refuge

0 0.25 0.5 1 Miles

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Guadalupe-Nipomo Dunes Wildlife Refuge: Successional Habitat Types

Coastal strand

Coastal foredunes

Coastal dune scrub

West

East

Guadalupe-Nipomo Dunes Wildlife Refuge: Foredune Rare Species

Western snowy plover (*Charadrius nivosus nivosus*)

Surf thistle
Cirsium rhothophilum

Dune spectaclepod
Dithyrea martima

Species Recovery: Western Snowy Plover

- Small shorebird
- Breeds primarily on coastal beaches from s.Washington to s.Baja California, Mexico
- Breed early March to end of September
- Listed in 1993 as Federally threatened
- habitat loss, human disturbance, and predation
- fewer than 2,000 breeding plovers remain in the Pacific coast population

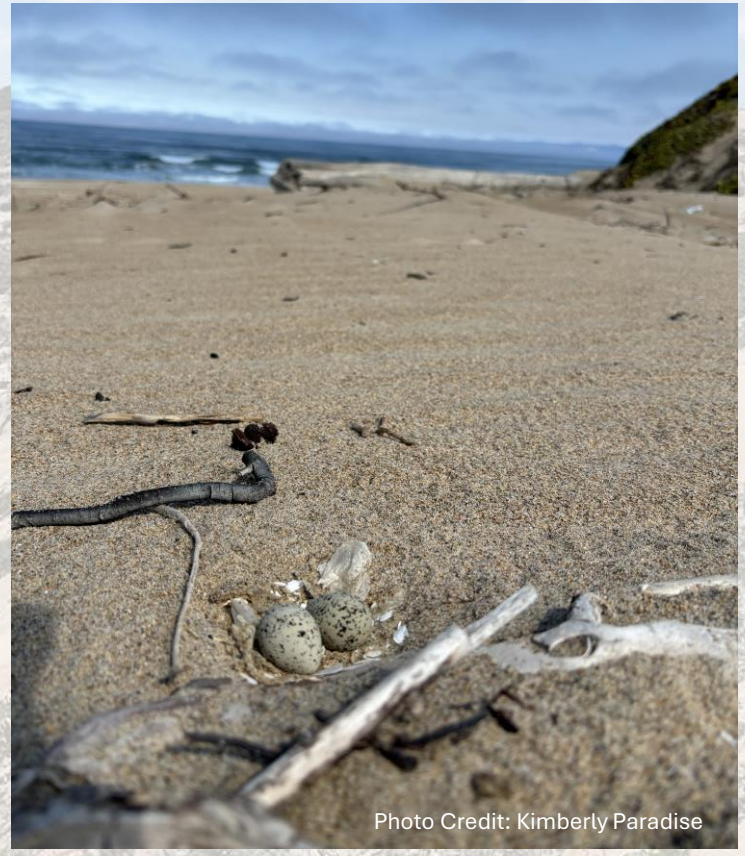


Photo Credit: Kimberly Paradise

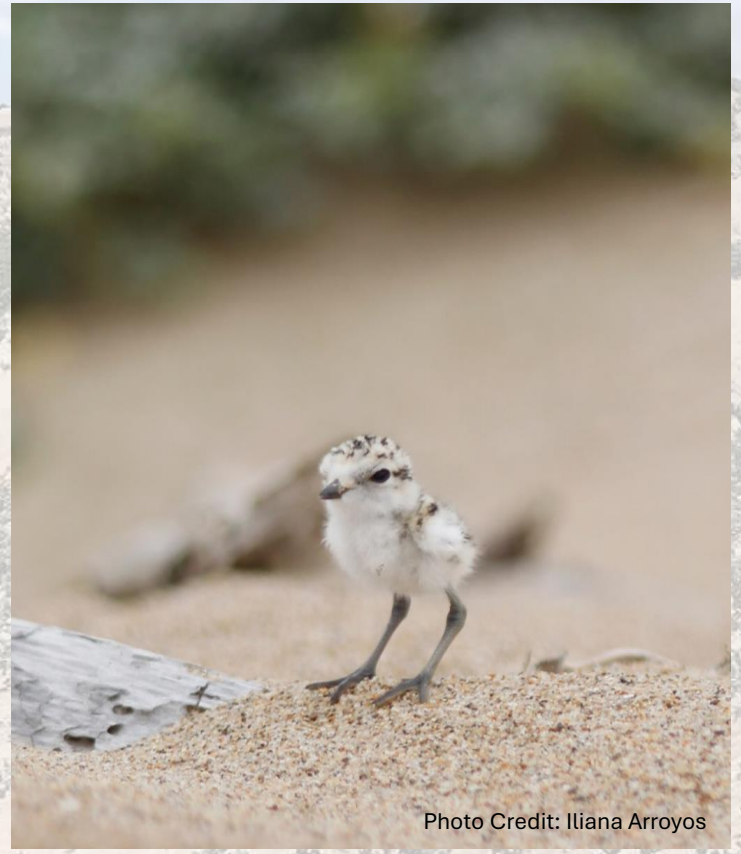
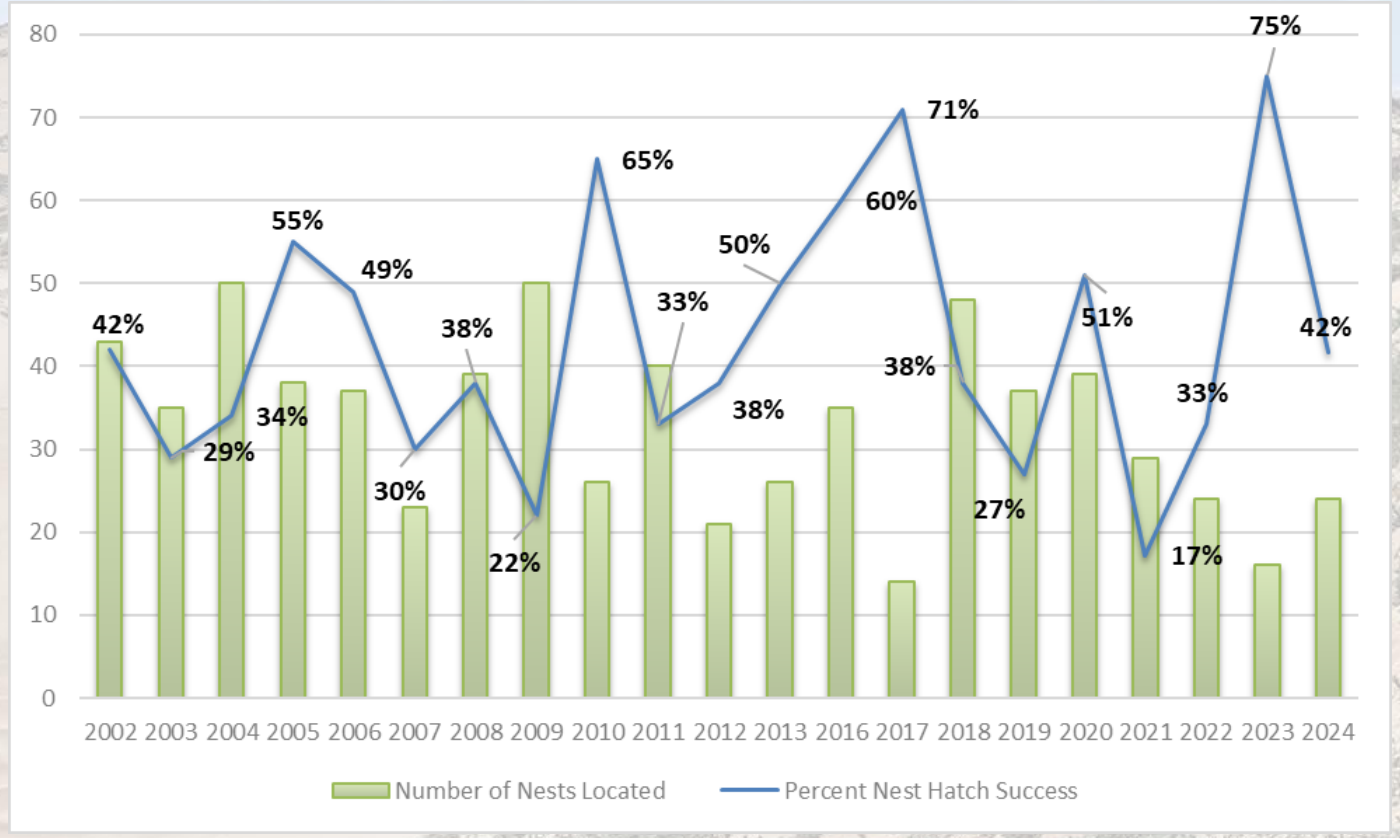


Photo Credit: Iliana Arroyos

Western Snowy Plover 2024 Survey



24 nests found in 2024 (42% successful hatch rate)

“Habitat degradation caused by human disturbance, urban development, introduced beachgrass (Ammophila spp.), and expanding predator populations have resulted in a decline in active nesting areas and in the size of the breeding and wintering populations.” WSP Species Recovery Plan, 2007

Foredune Habitat Invaders

Iceplant
Carportus ssp.

European beachgrass
Ammophila arenaria

Purple ragwort
Senecio elegans

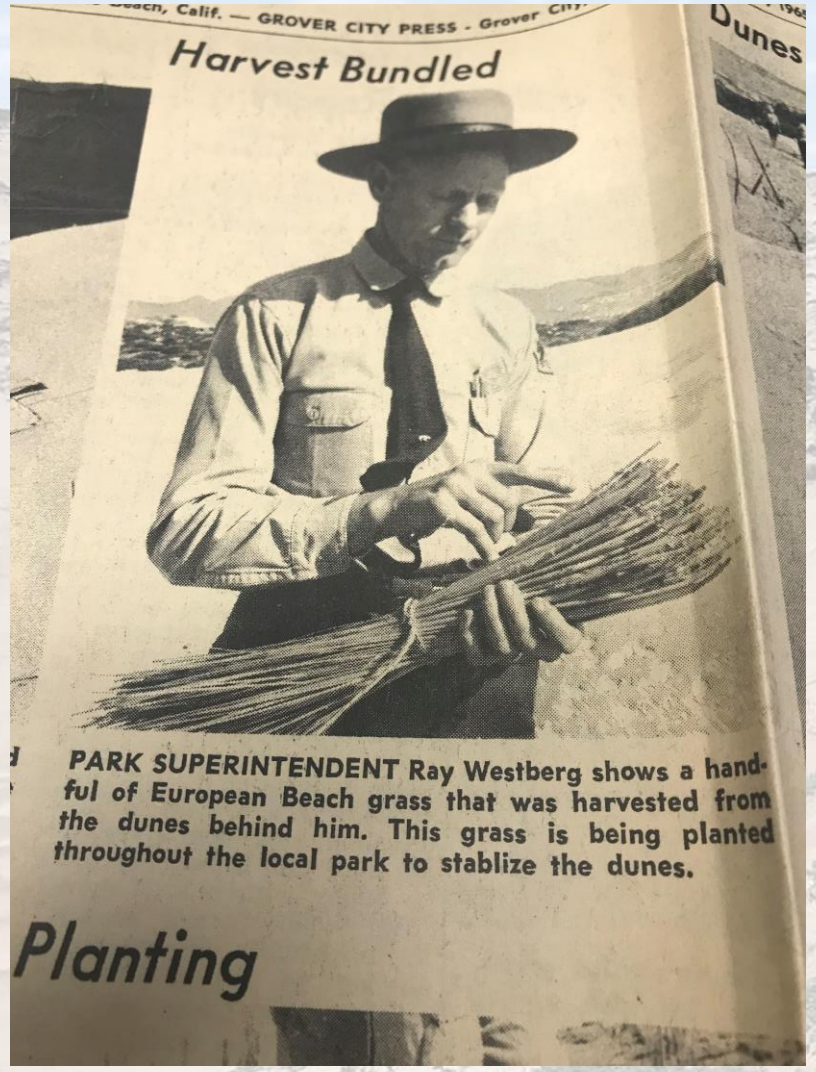
Aggressive Invader

Ammophila arenaria
European beachgrass

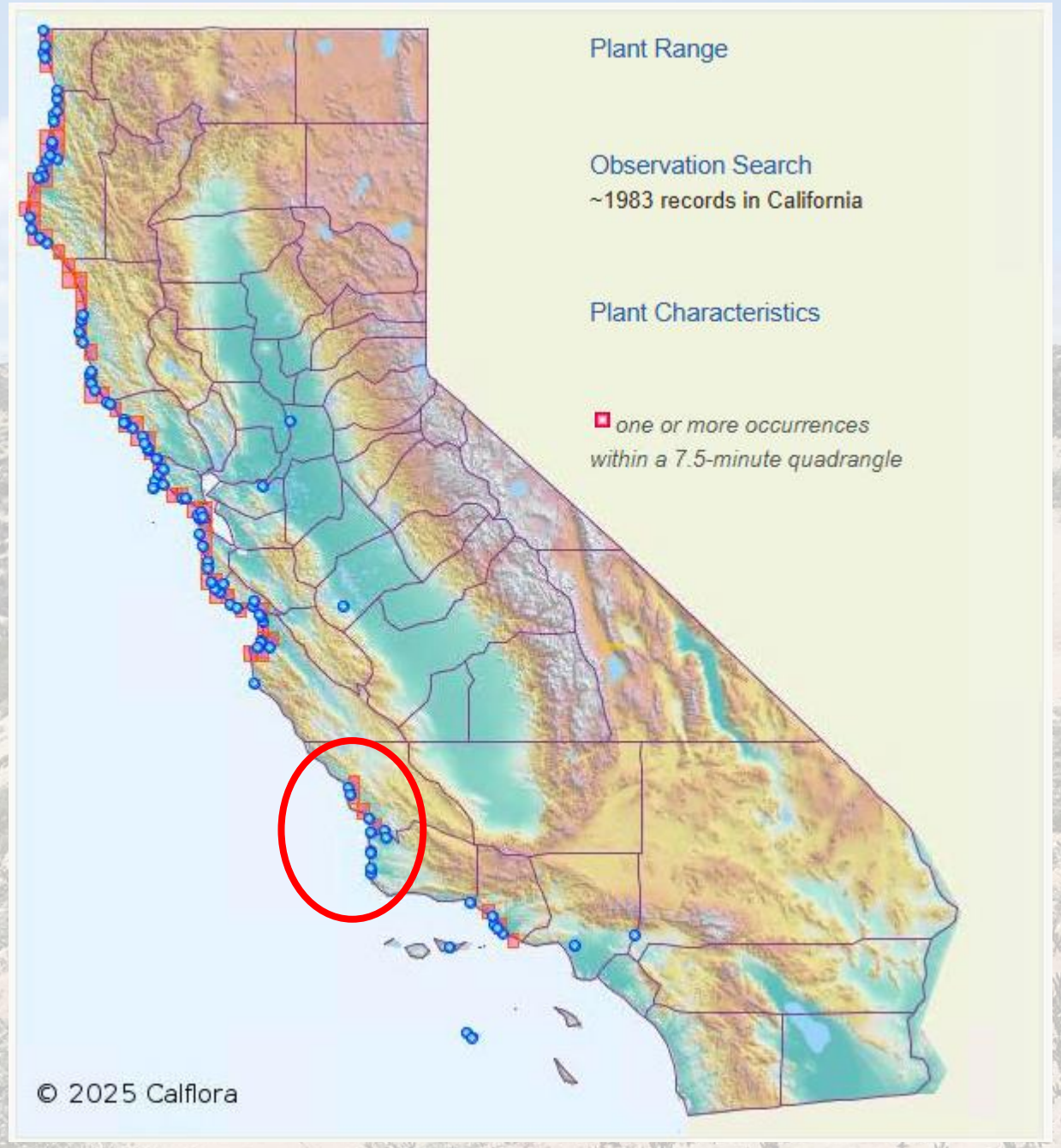
Susceptible Ecosystem

Coastal Foredune

European beachgrass
Ammophila arenaria



Pismo Times, May 1965



Ammophila arenaria Key Attributes

- Clumping perennial grass (approx. 4 ft tall)
- Course, tough foliage and long thick rhizomes
- Rhizomes within the top 8 inches of the sand
- Reproduces predominantly by rhizome
- When rhizome is buried, stimulates additional growth
- Seed viability appears very low
- Dormant during summer (leaves curl closed)

European beachgrass Impacts

European beachgrass causes a rapid type conversion from open native foredunes and dune scrub to dense monocultural grassland.

Native plant species are unable to survive or germinate. Species are unable to move naturally through the ecosystem.

Management Challenges

Access
- Minimal roads, UTV access only through Refuge
- Beach access only available during off season
- Transporting water for herbicide mixing

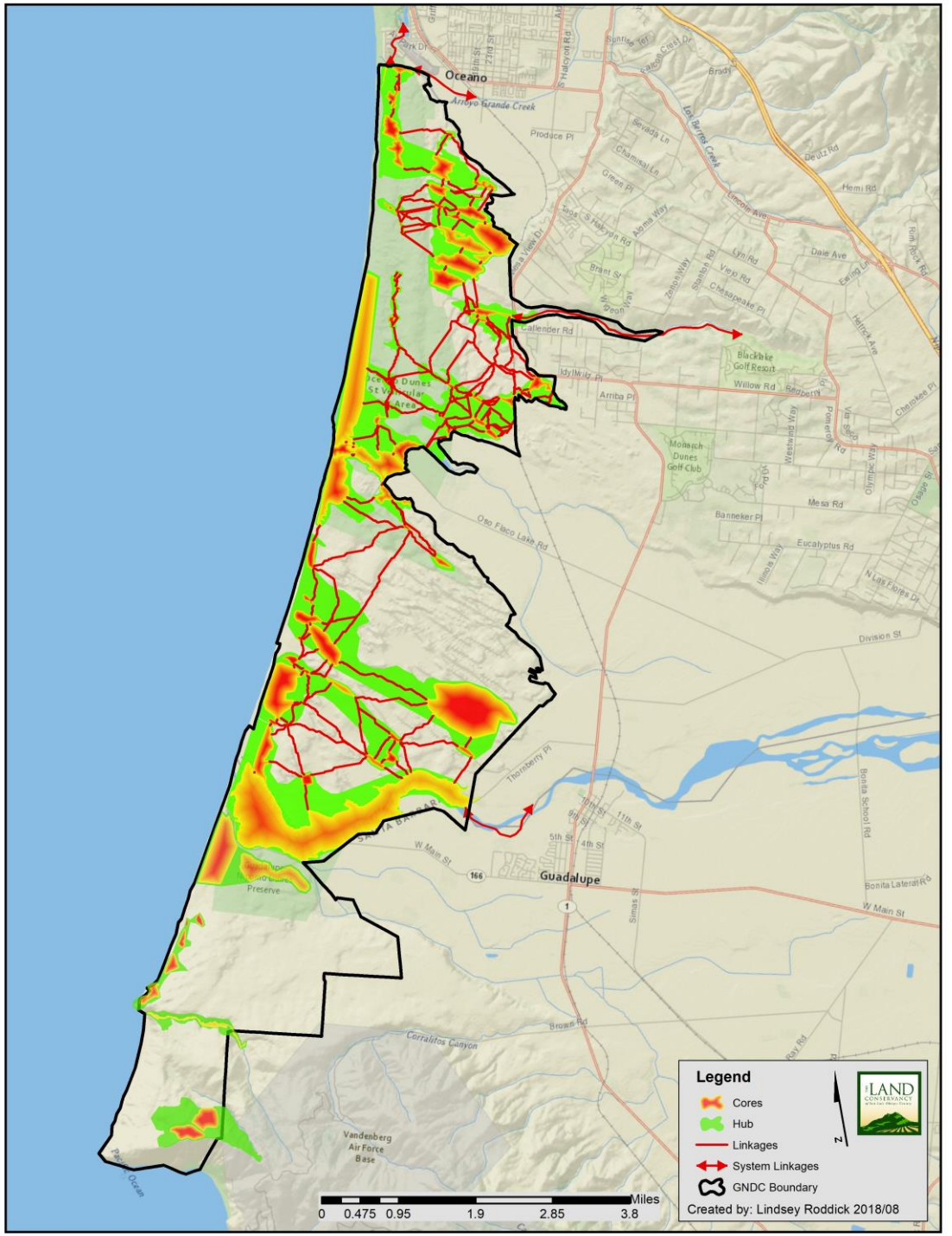
Resources
- Rare plant species abundant
- Plover nesting begins in March each year

Size of Invasive Population
- Massive area to manage
- Need for a Refuge-wide invasive species approach

Dune Protected Area Network

Cores: pristine habitat with high concentration of rare species and habitat

Hubs: defensible space surrounding the cores providing a buffer for important areas

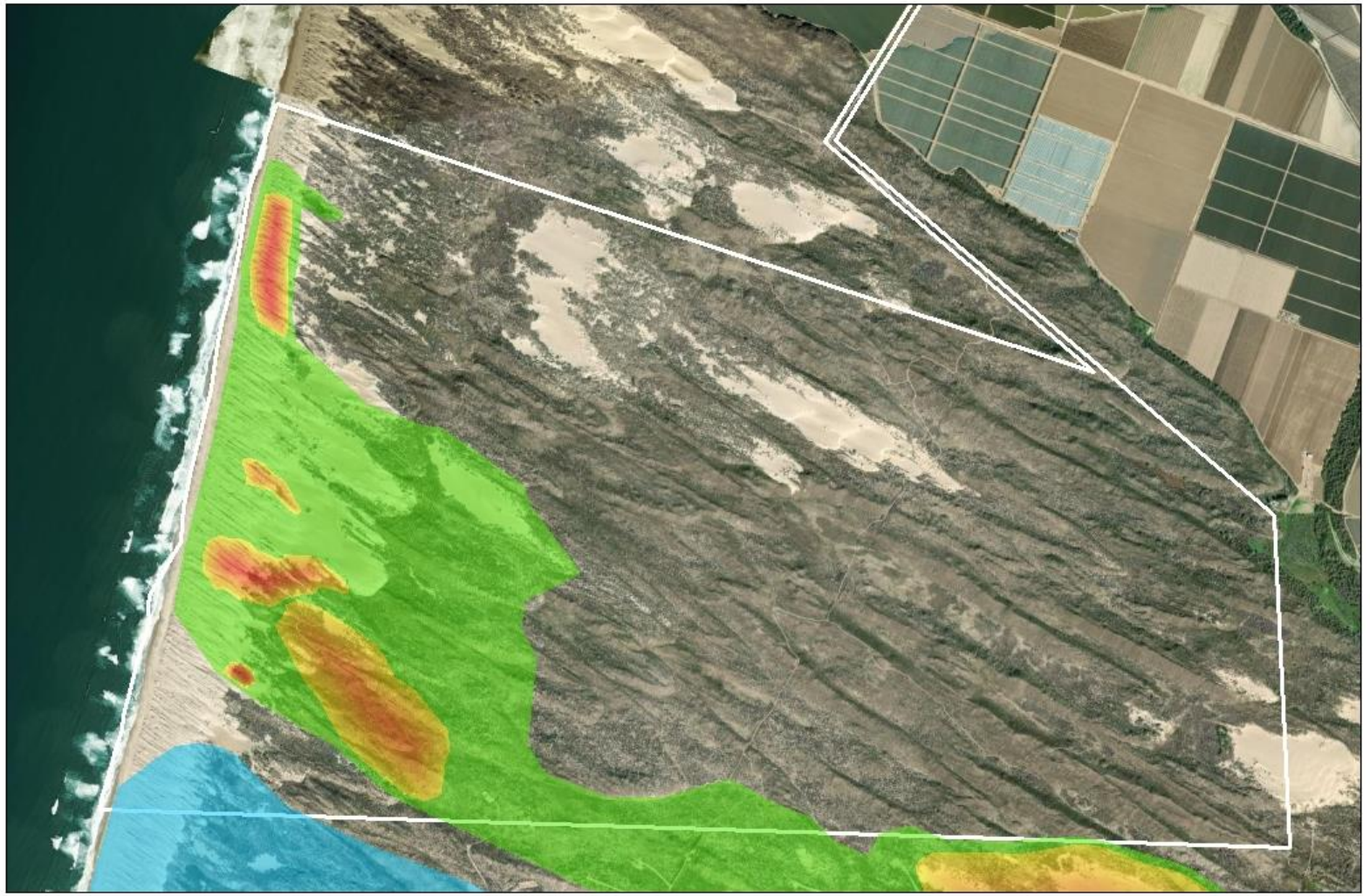


Dune Protected Area Network

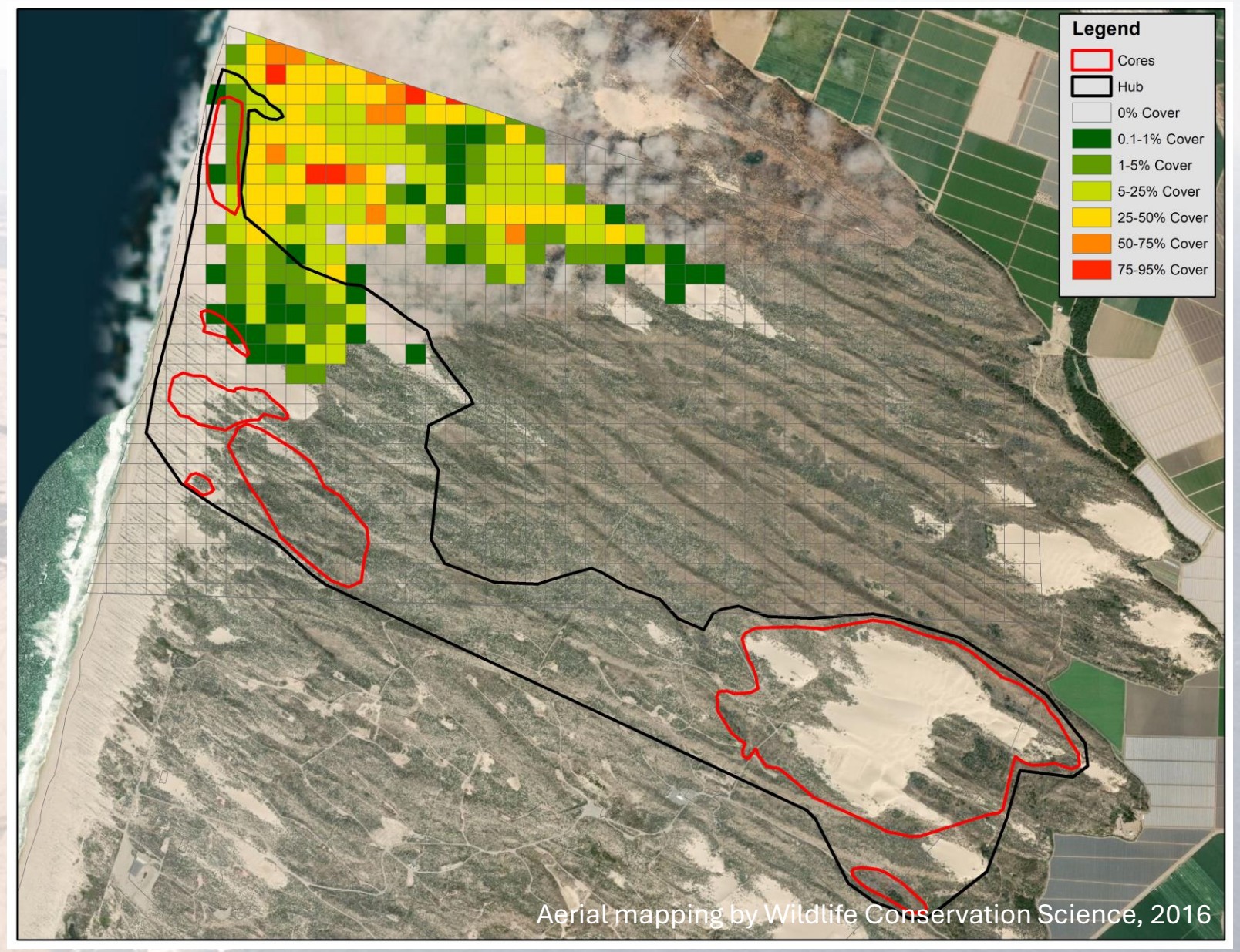
- Areas of high diversity, low % cover invasive species
- Provide important resources fauna and rare flora
- Successional habitats, representing the entire complex

www.lcslo.org/dunesconservationplan

Dune Protected Area Network



European Beachgrass Cover



Invasive Species Management

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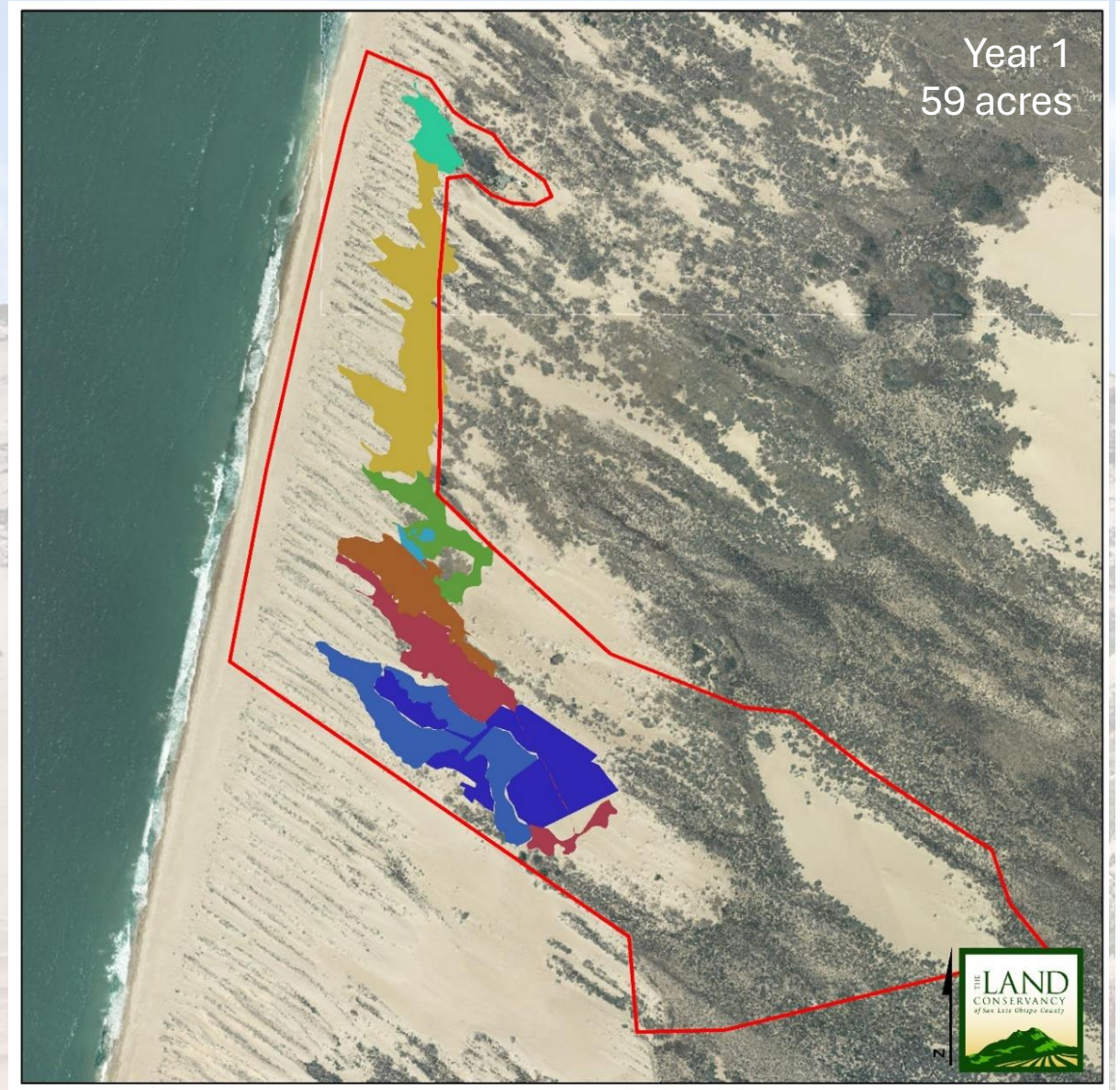
Invasive Species Management

Survey and flag rare species

- Restoration Ecologist surveys ahead of crew

Ground Herbicide Application

- Fall/Winter after dormancy breaks but before WSP nesting season
- Truck Sprayers: 2-600 ft reels /300 ft extension
- Backpack Sprayers in low density/ previously treated areas
    - Supported by UTV/Truck nurse tanks
- Herbicide Mix Used:
    - Habitat (Imazapyr) 1%
    - Roundup Custom (Glyphosate) 2%


Year 1
59 acres
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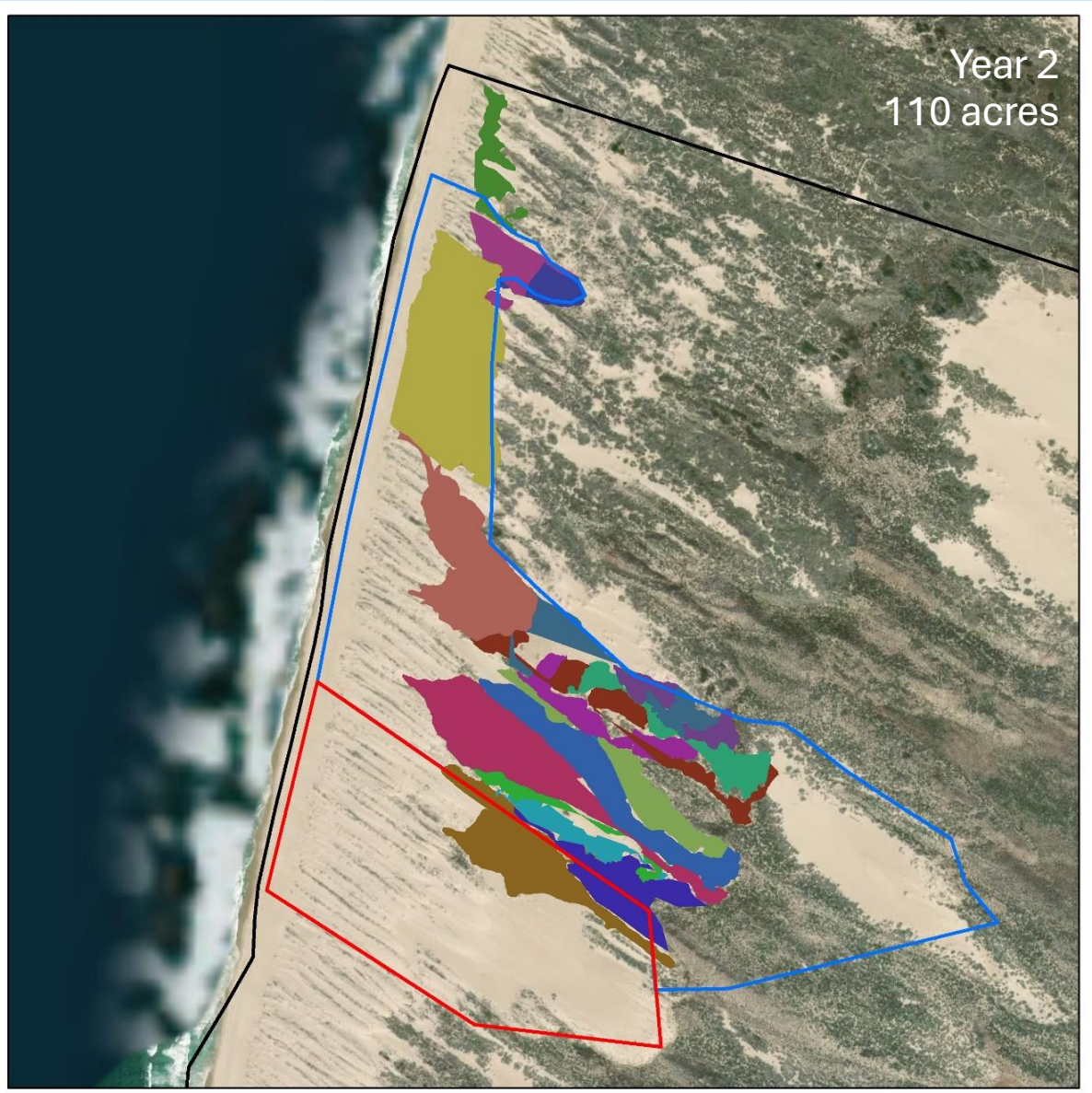
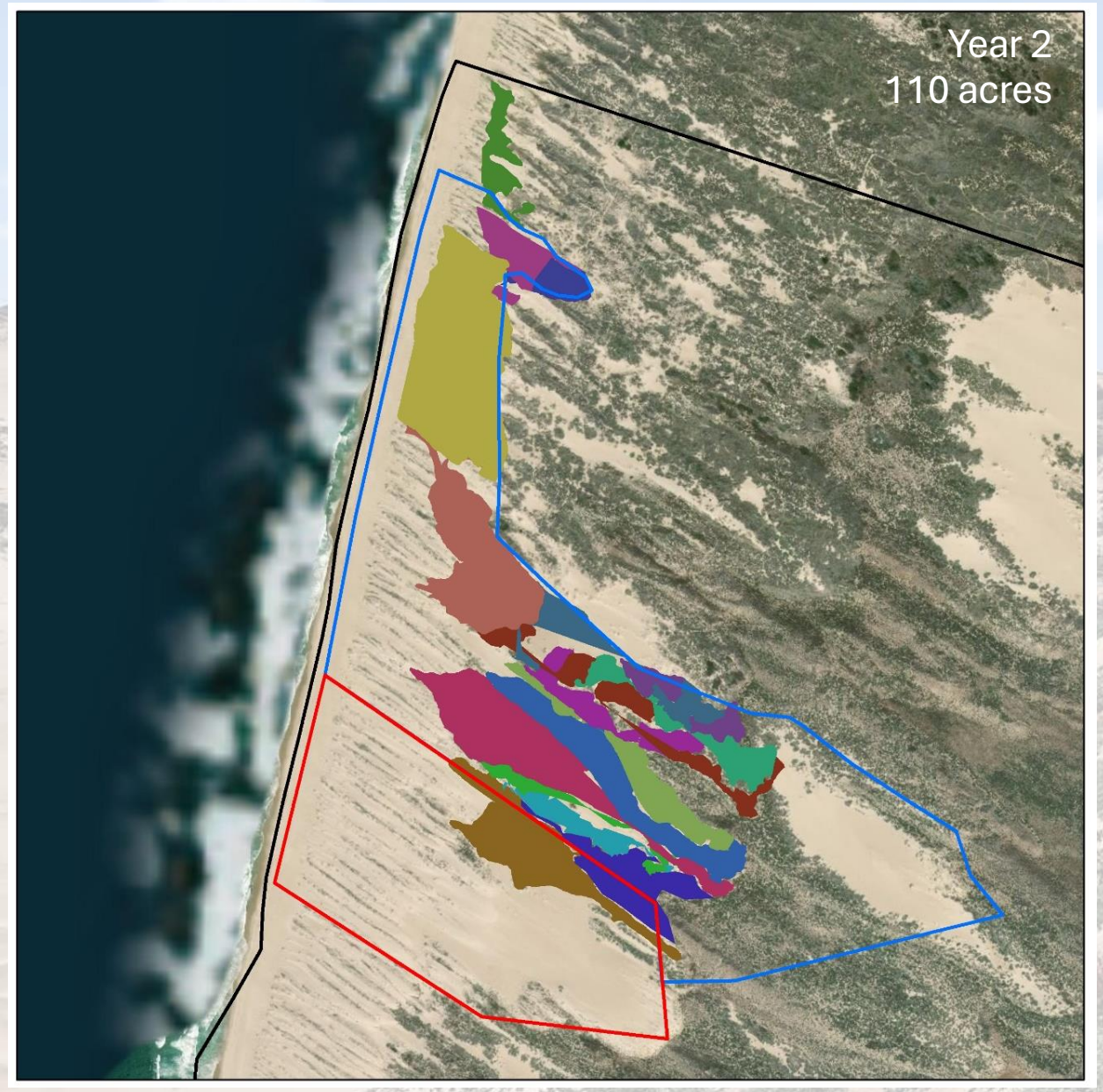

Year 2
110 acres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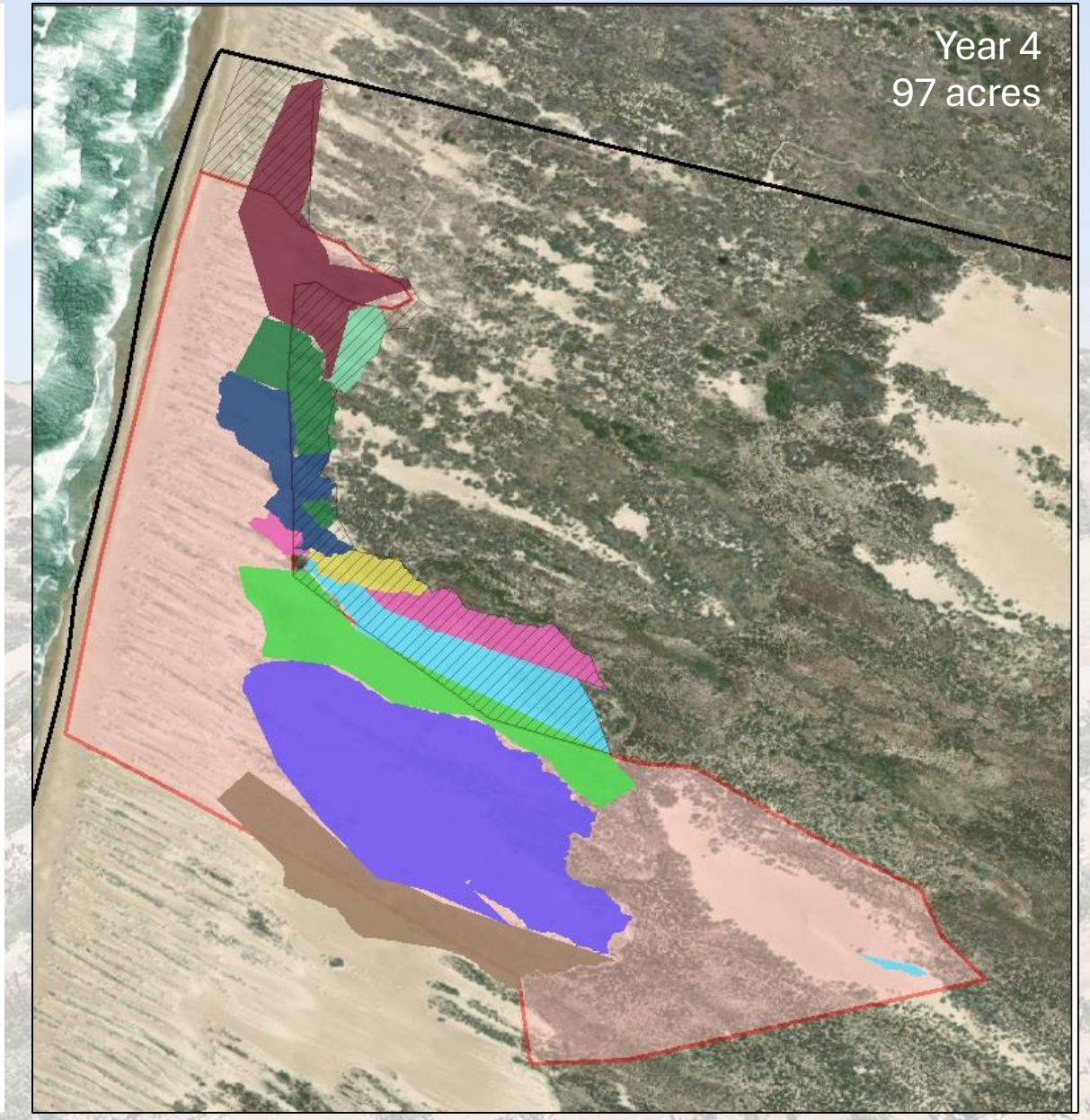
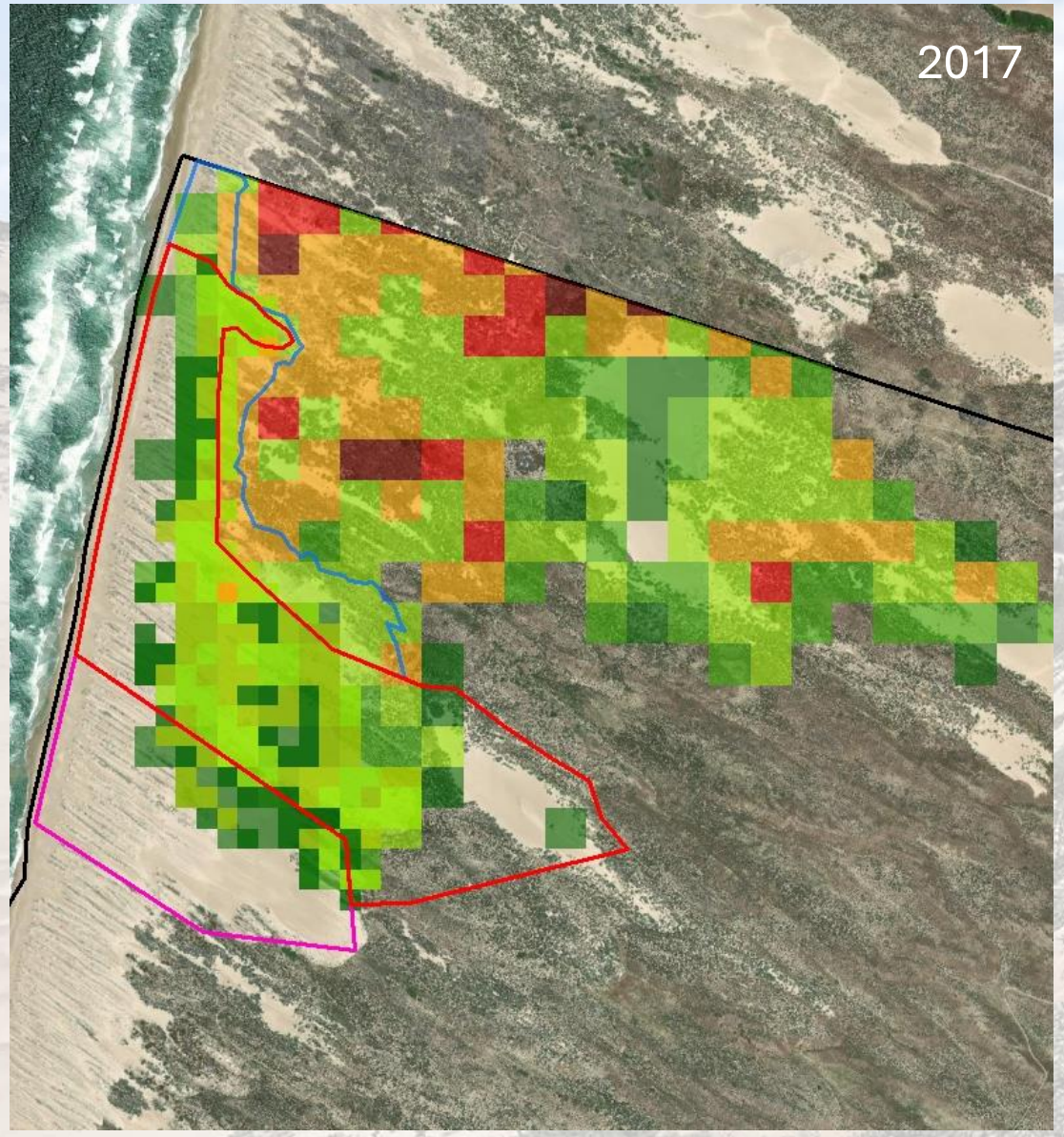
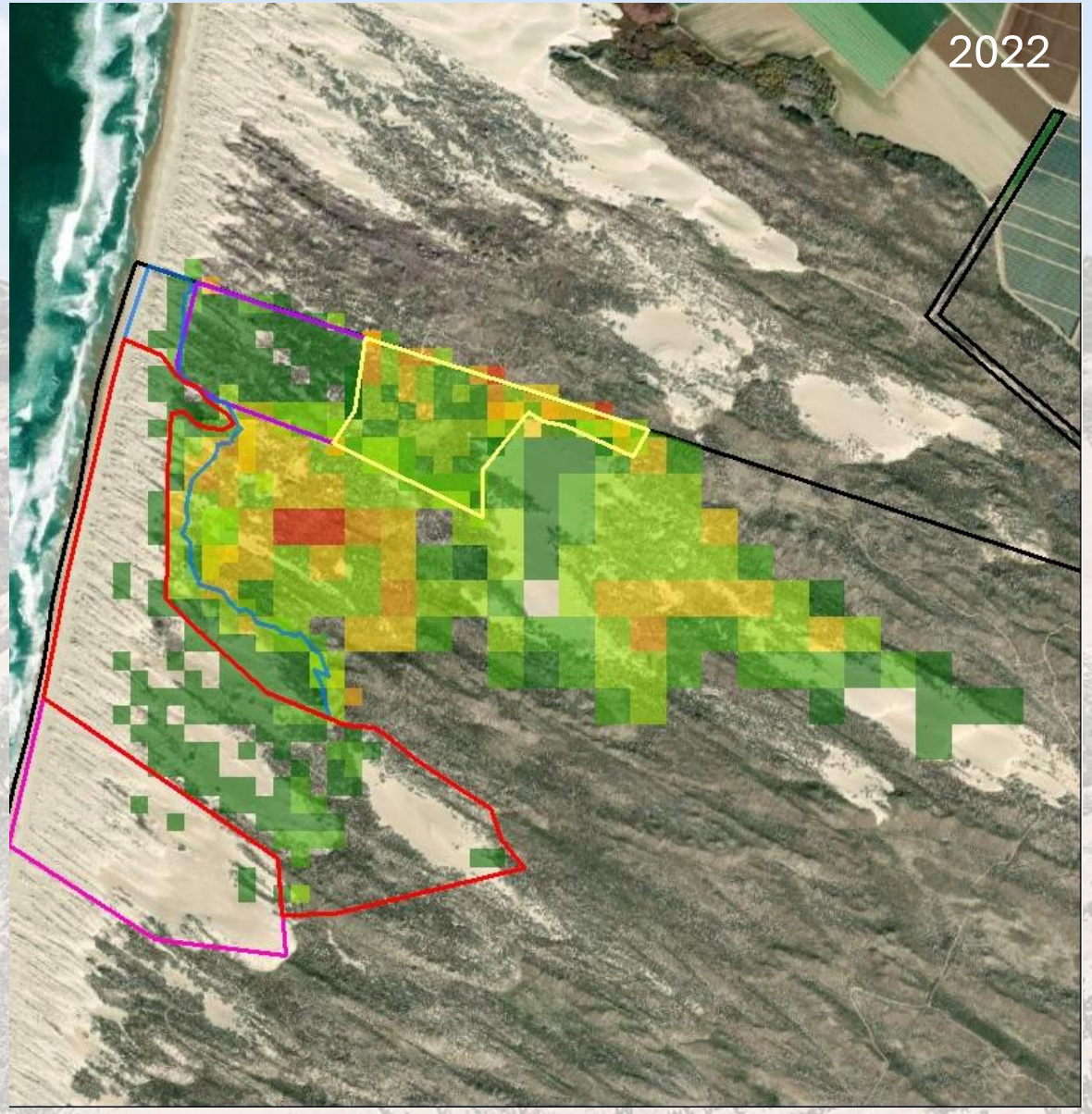

Year 4
97 acres

Monitoring Success





Monitoring Success

POST YEAR 1

Monitoring Success

POST YEAR 1

Dune Activation

Natural Recruitment

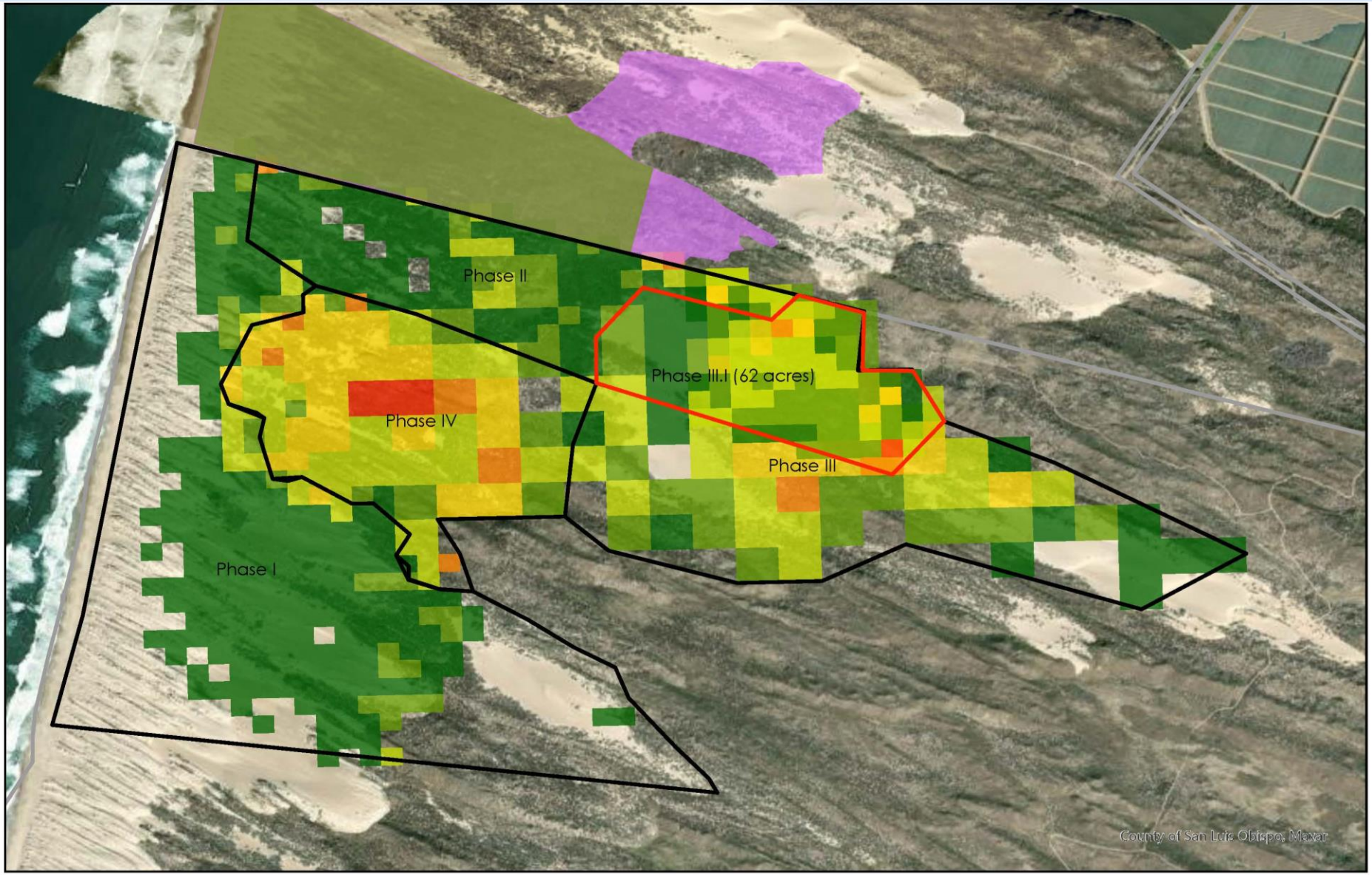
Natural Recruitment

POST YEAR 1

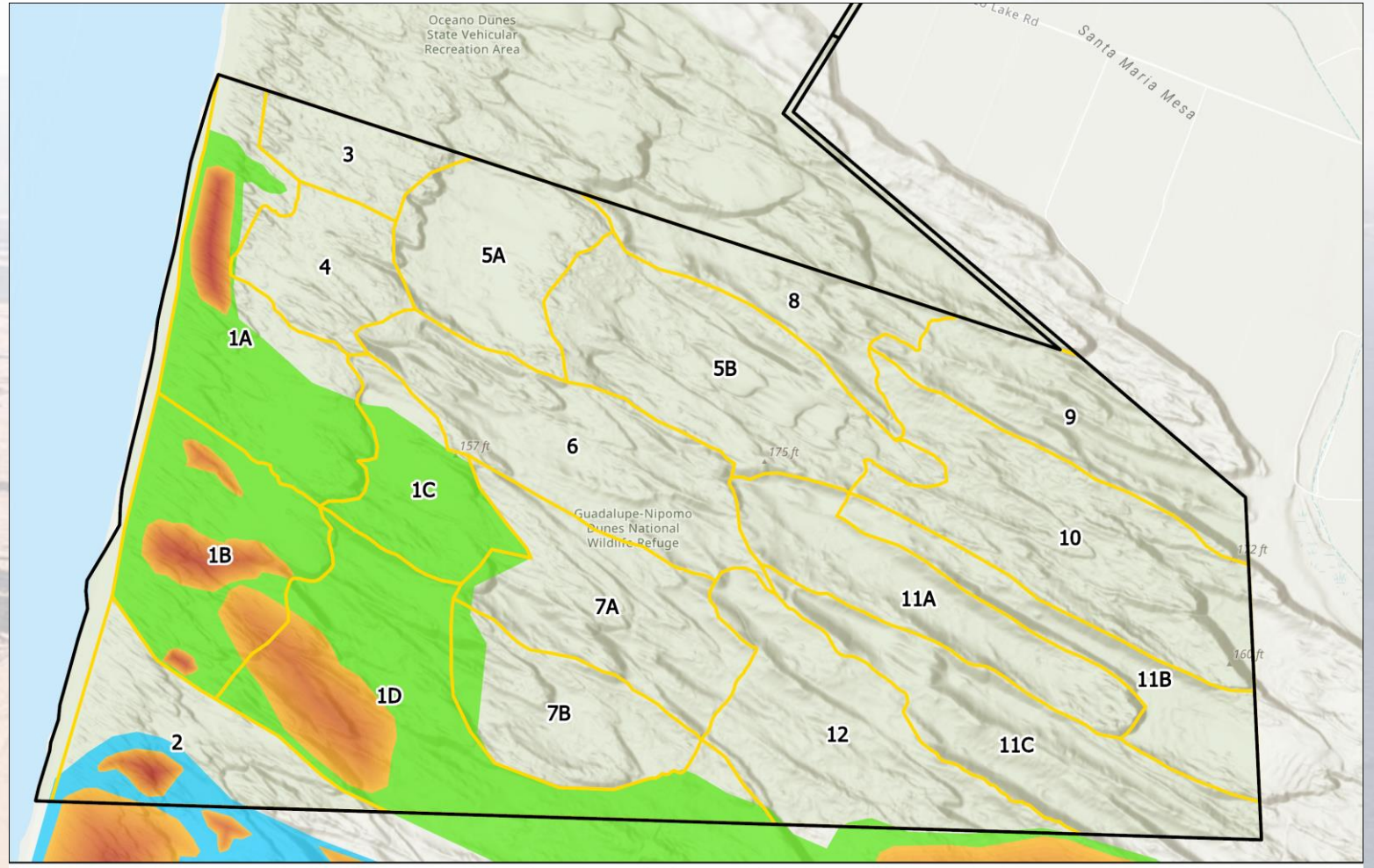
POST YEAR 4

Secondary Invaders

Beachgrass Next Steps



Dune Protected Area Network & Invasive Plant Management Plan



Dune Protect Areas (DPAs) within the Guadalupe - Nipomo Dunes National Wildlife Refuge

Refuge_Boundary
Management Units
Chevron DPA
DPA Cores
Refuge DPA

0 0.25 0.5 1 Miles

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Take Aways

- Overall management strategy just as important as actual control methods
  - Work on the outer edge of the population for better success
- Creative management is necessary when access is difficult
- There can be natural recruitment even with soil activity of herbicide (low organic matter)
- Dead material does slow down natural recruitment (especially inland). Watch for secondary invaders
- Monitoring is critical to identify when something isn't working and you need to change approaches
- Eradication of widespread invasive species may be possible if there is regional coordination and support

Partners

Joseluis Ocaranza, Refuge Manager
Colleen Grant, Coastal Program Regional Coordinator
Kristie Scarazzo, Senior Botanist
Deborah Kirkland, Senior Fish & Wildlife Biologist

Funders