

Greater Sandhill Crane overwinter roost site use in the Lower Colorado River Valley

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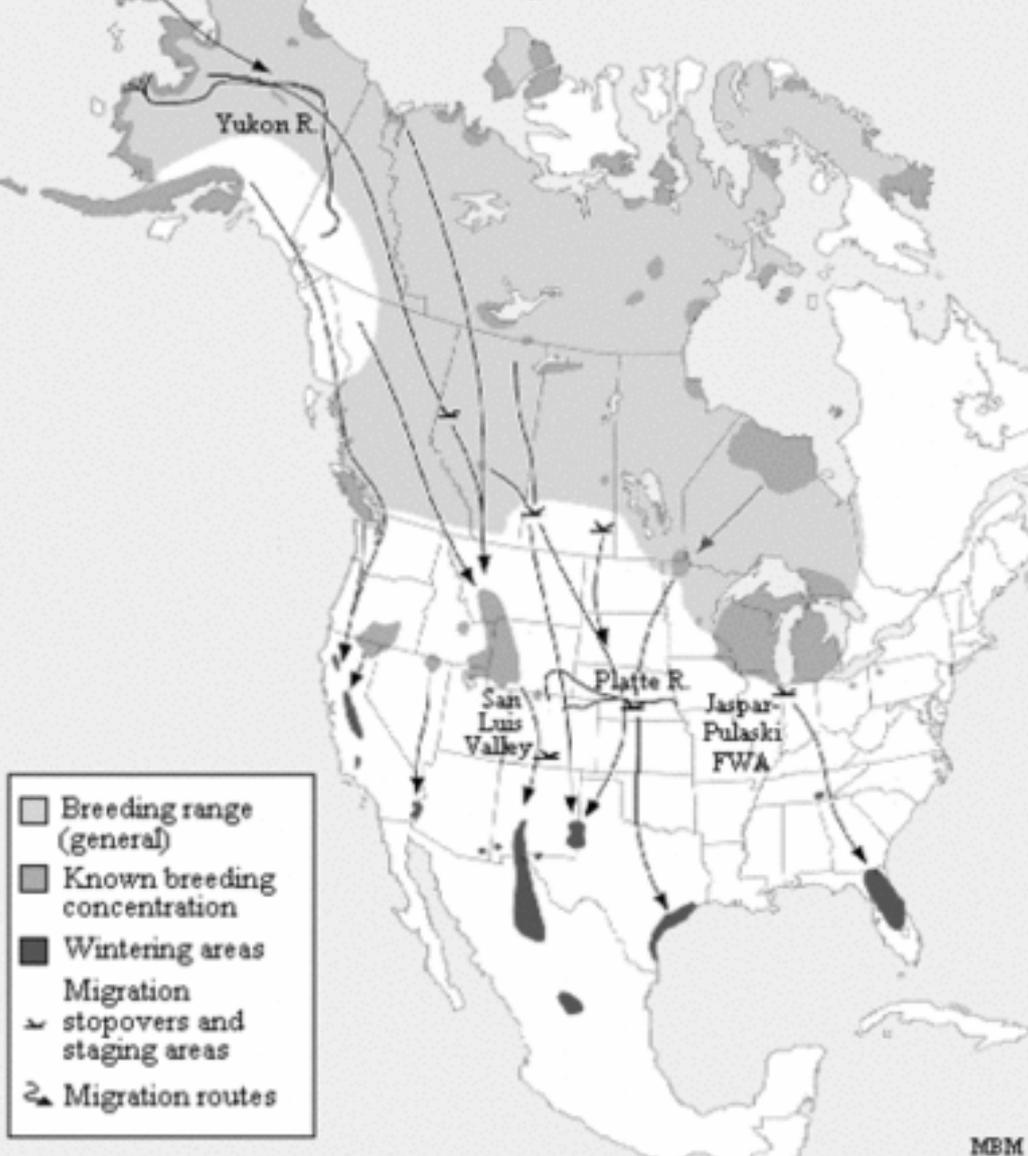
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Sandhill Crane

Grus canadensis
(migratory subspecies)



- ▶ The 6 subspecies include greater, lesser, and Canadian (migratory subspecies)
- ▶ Florida, Mississippi, and Cuban (non-migratory subspecies)
- ▶ The nine populations are designated primarily for management purposes and include:
 - Cuban (CP)
 - Florida (FP)
 - Eastern (EP)
 - Mississippi (MP)
 - Mid-Continent (MCP)
 - Rocky Mountain (RMP)
 - Lower Colorado River Valley (LCRVP)
 - Central Valley (CVP)
 - Pacific populations (PP)

Introduction

- ▶ LCRVP smallest of migratory populations
- ▶ Known breeding range: NE Nevada, SW Idaho
- ▶ Known wintering range: LCRV (Cibola NWR, Sonny Bono NWR, Gila River, and CRIT land)

Introduction

- ▶ LCRVP
 - Lack of breeding ground information
 - <2500 individuals and lowest recruitment rate (~4.8%)
- ▶ Migratory Shore and Upland Game Bird Support Task Force ranked priorities for LCRVP
 - Define winter movements
 - Identify habitat needs and new breeding ranges
 - Habitat selection and use during spring migration
 - Information on intermixing crane breeding populations
 - Future winter needs given climate change

Objectives

- ▶ Courtenay's thesis: assess overwinter habitat selection and space use and identify migratory pathways, stop-over, and staging areas
- ▶ Additional goals: identify breeding areas, if intermingling among breeding populations exists, climate change impacts



Study Area 1: Cibola National Wildlife Refuge

- ▶ ~7,464ha in La Paz County, AZ
- ▶ 1964– mitigate habitat loss due to Colorado River channelization projects
- ▶ Neotropical migrants, waterfowl, cranes, wading birds, and native fish
- ▶ Colorado River floodplain, surrounded by Sonoran Desert ridges



Cibola NWR

- ▶ Main land cover types:
 - Cropland
 - MSM/flooded impoundments
 - LCR
 - Salt cedar
- ▶ Average rainfall ~5.1 cm
- ▶ Average temperatures:
 - Summer: 41⁰ C
 - Winter: 20⁰ C



Study Area 2: Imperial Valley

- ▶ Imperial County, CA
- ▶ Stretches 80km from the southern tip of the Salton Sea to the Mexico border
- ▶ Mainly agriculture:
 - Crops
 - Dairies
 - Granaries
- ▶ Average annual rainfall ~9cm
- ▶ Average annual temperatures
 - Winter: 13° C
 - Summer: 32° C



Sonny Bono Salton Sea National Wildlife Refuge

- ▶ 13,260ha in Imperial County, CA
- ▶ 1930– Entice migratory waterfowl and prevent crop damage
- ▶ Four main land cover types:
 - Salton Sea
 - Impoundments
 - MSM units
 - Cropland



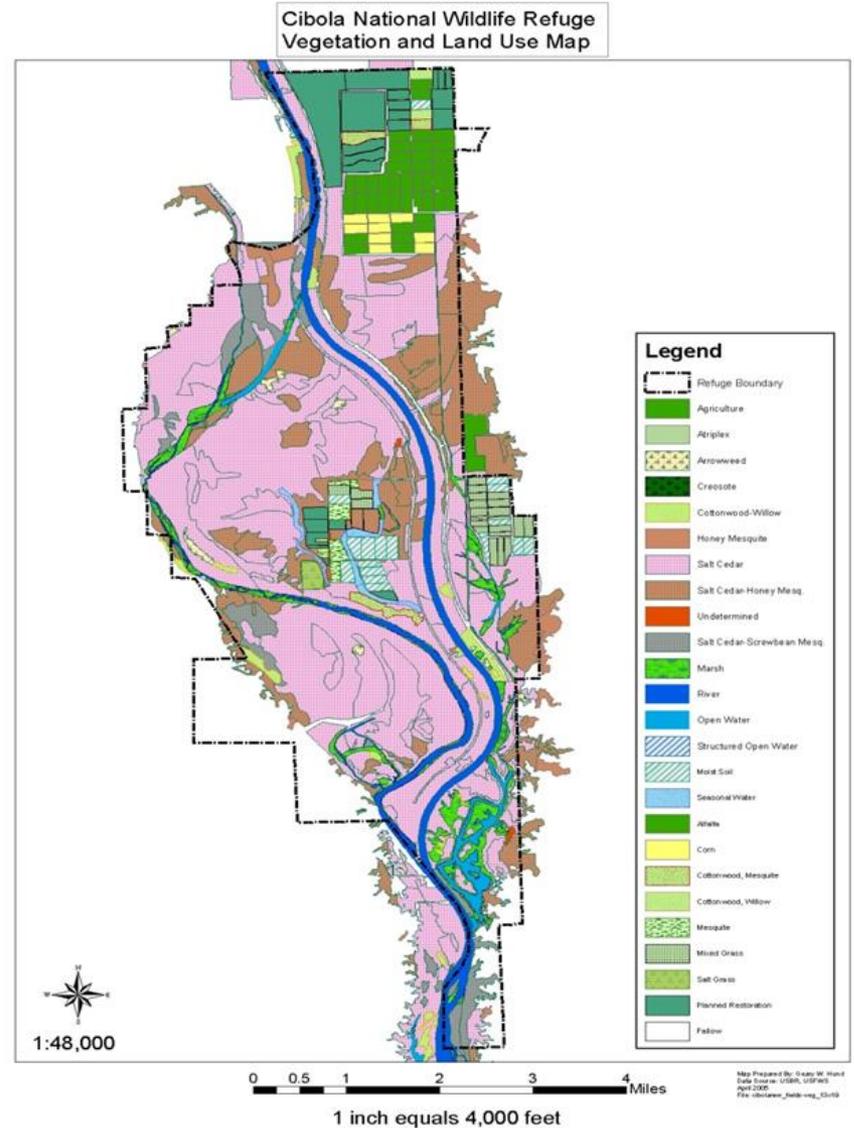


Data Collection

- ▶ Data
 - Location
 - Method
 - Bird identification (ID) number
 - Band ID
 - Age
- ▶ PTTs programmed to collect 4 locations/day
 - 7:00
 - 14:00
 - 17:00
 - 22:00
- ▶ Roost time: 22:00 and 7:00



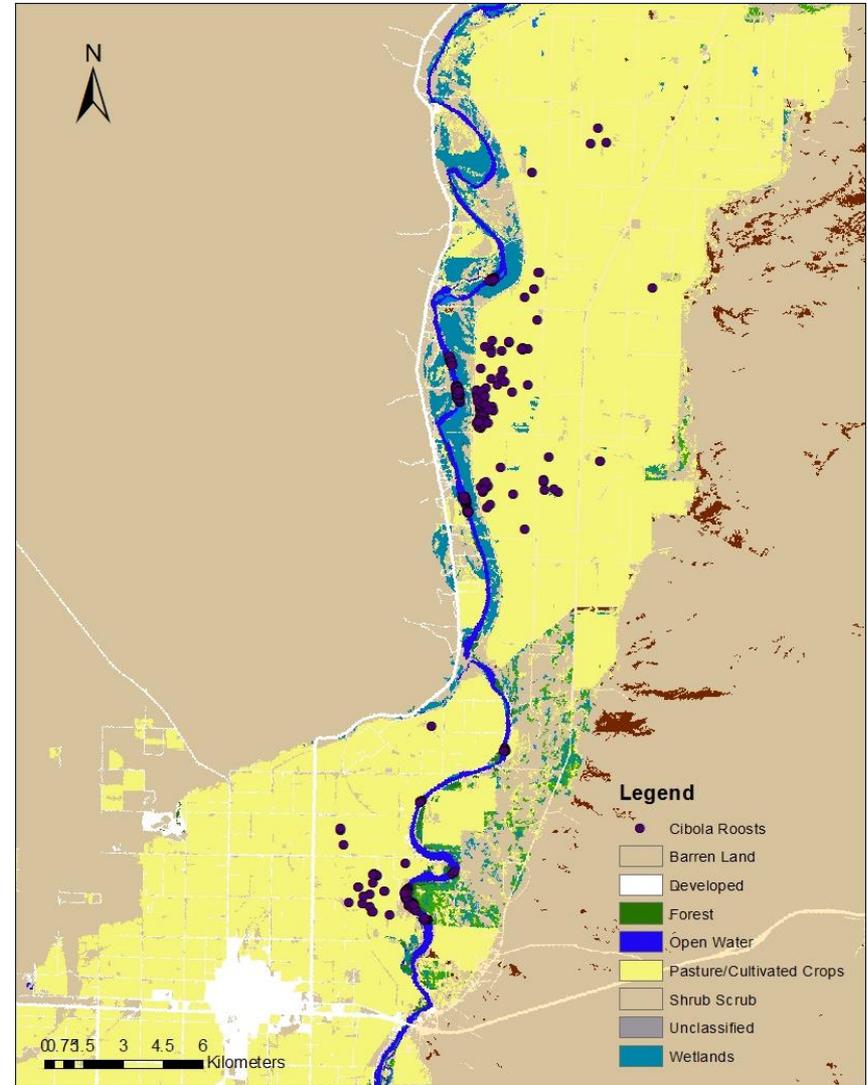
- ▶ Classify land cover layers based on ground truthing
- ▶ Spatial join roost locations and land cover layers
- ▶ Assess % of roost locations in specified land cover types
 - Barren land
 - Developed
 - Open Water
 - Agriculture
 - Shrub-Scrub
 - Unclassified
 - Wetlands



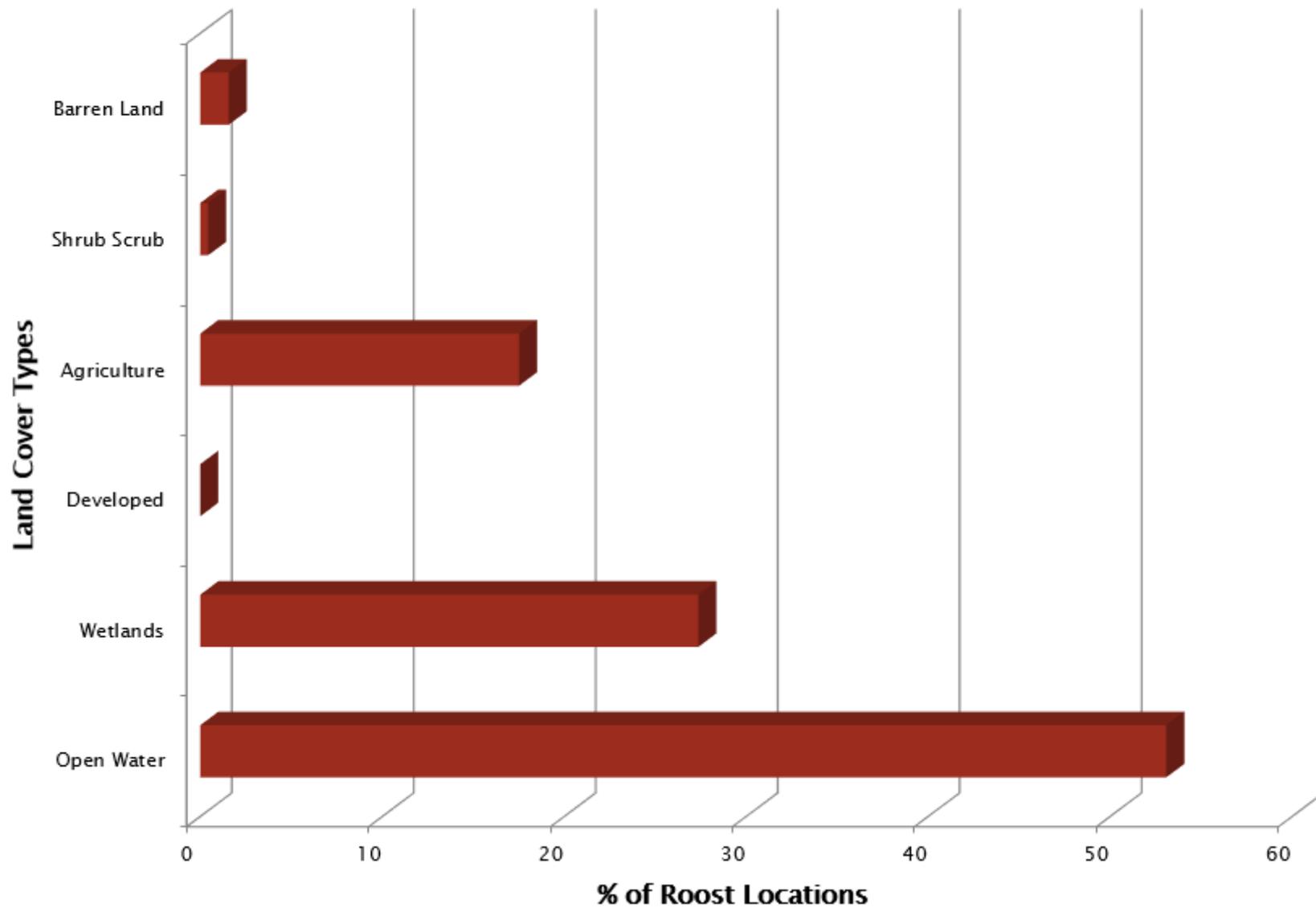
Cibola

- ▶ 1823 usable locations
- ▶ 4 of 10 used areas off of refuge (CRIT land, Cropland, and River)
- ▶ Majority of locations among all birds were in open water
 - Sandbars of LCR

Crane Use off Refuge



% of Roost Locations in Associated Land Cover Types



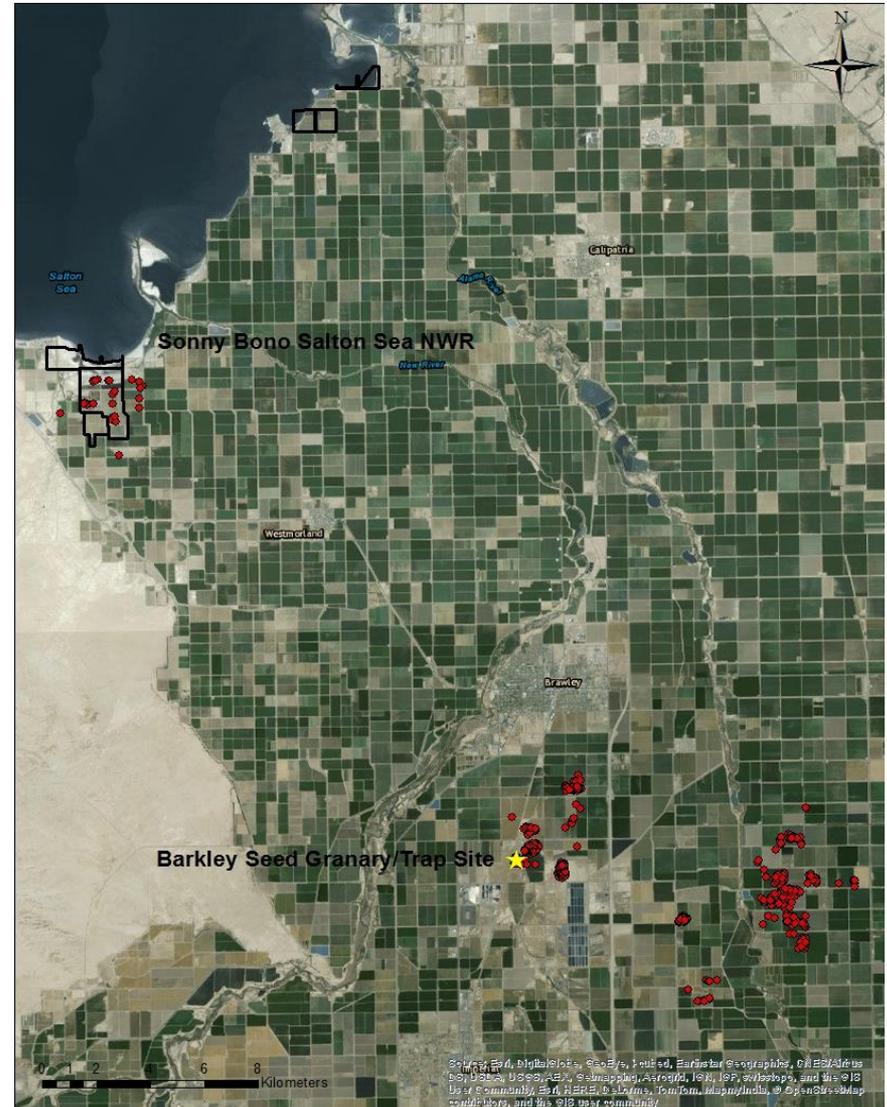
Cibola

- ▶ Open Water: LCR sandbars
- ▶ Wetlands: primarily flooded impoundments/MSM
- ▶ Ag: tilled dirt or mowed hay/grass
- ▶ Barren land: areas cleared of salt cedar and areas that are no longer flooded

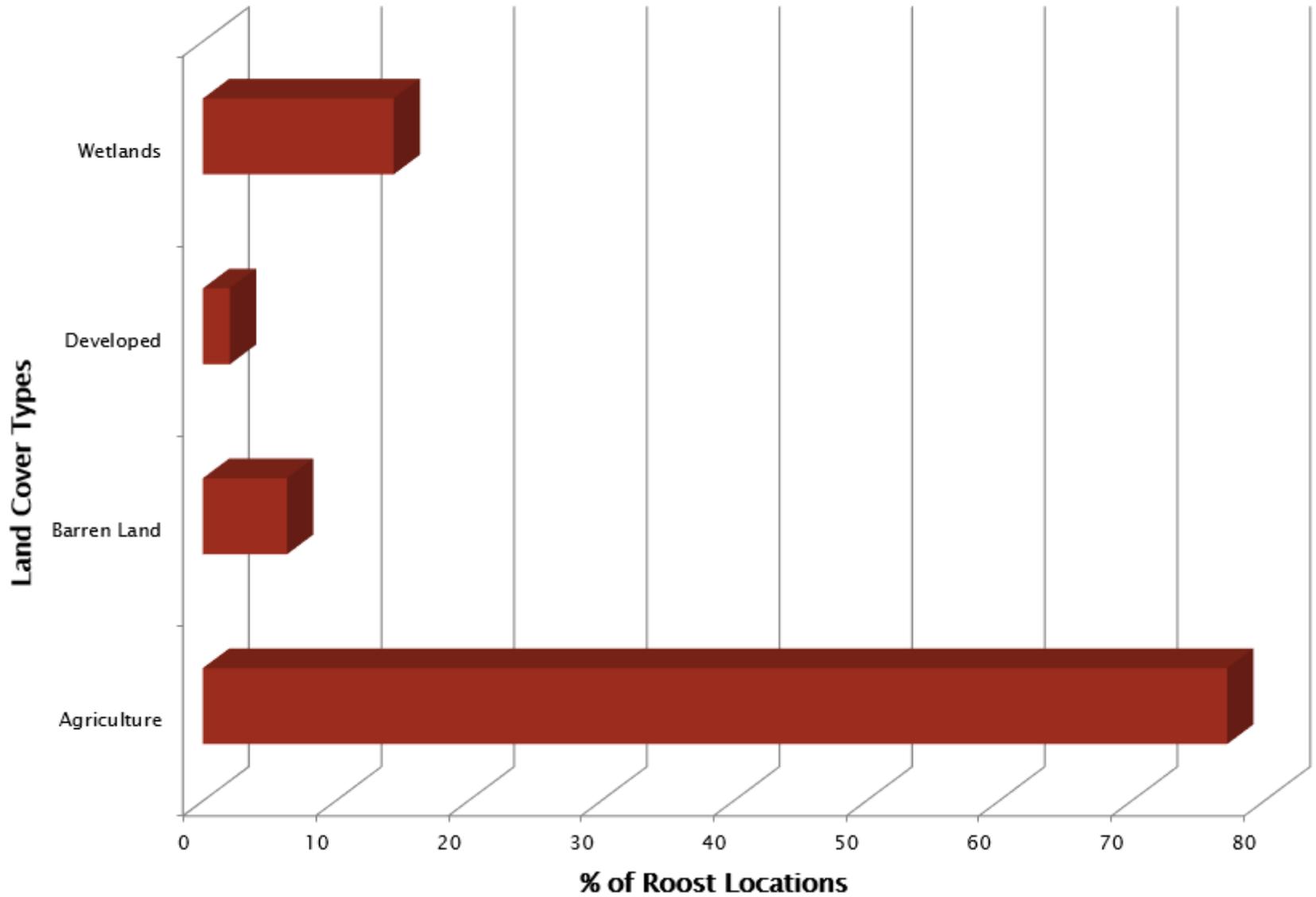


Imperial Valley

- ▶ 836 Usable locations
- ▶ 1 of 5 used Sonny Bono Salton Sea NWR
- ▶ Majority were in agriculture fields



% of Roost Locations in Associated Land Cover



Imperial Valley

- ▶ Agriculture: flooded ag fields and mowed wheat
- ▶ Wetlands: MSM and flooded impoundments
- ▶ Barren Land: areas of open dirt on refuge
- ▶ Developed: granaries

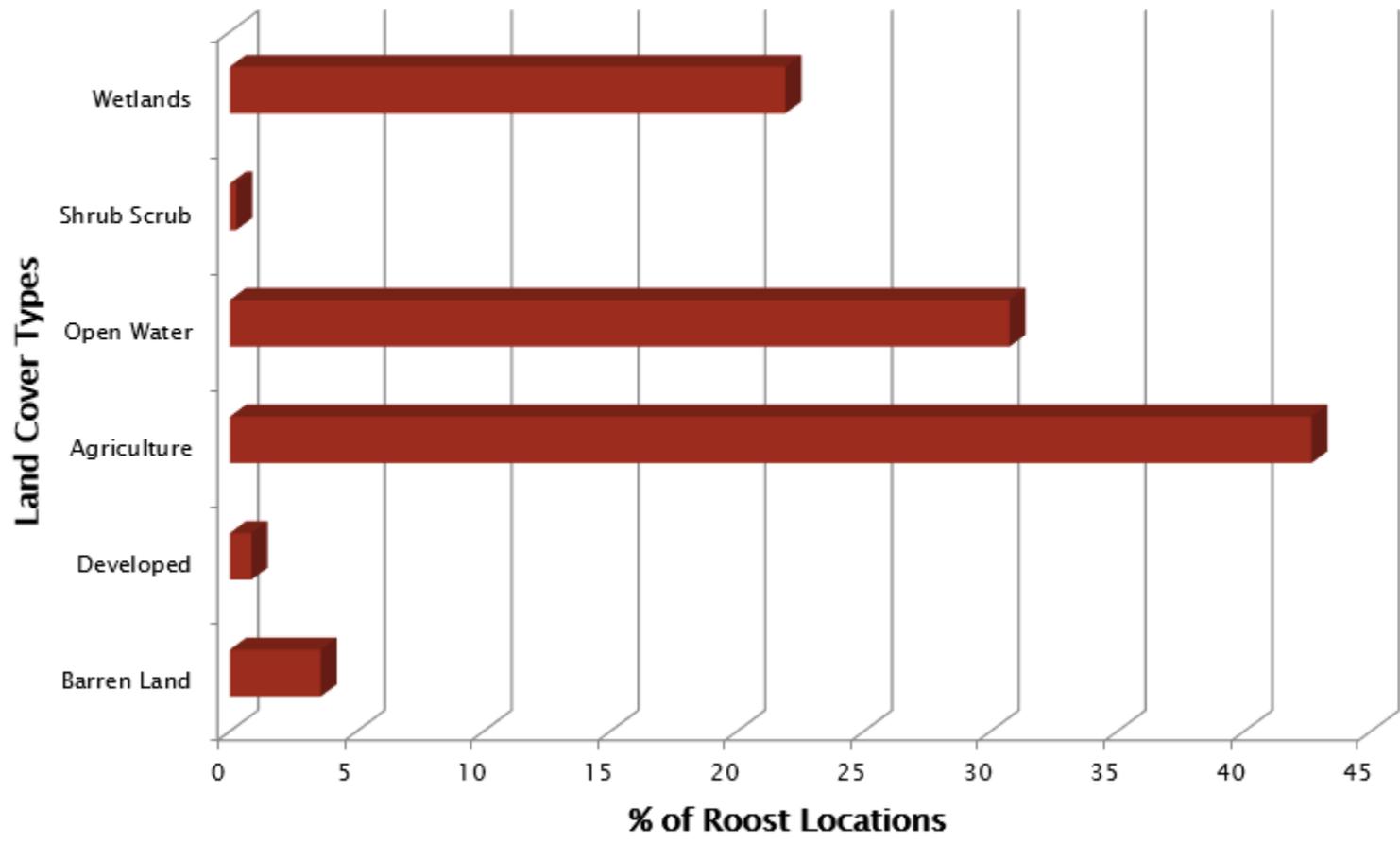


Summary

- ▶ River is key roosting site for eastern half of LCRVP
- ▶ Flooded ag fields for the western half
- ▶ Wetlands (impoundments, MSM, natural marshes) are being used

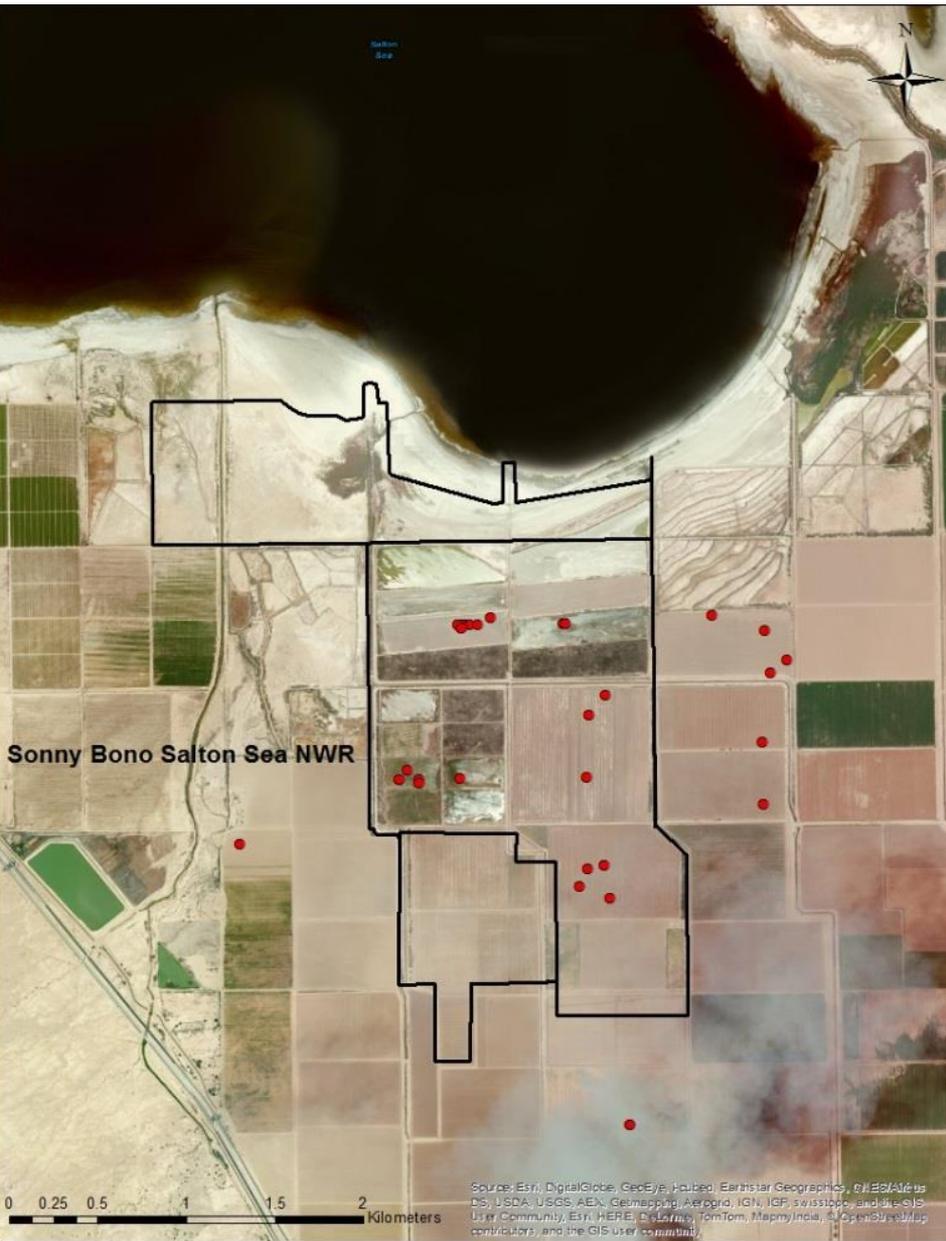


% of LCRV Roost Locations in Associated Land Cover Types



Courtenay's Thesis

- ▶ Use generalized mixed linear model to assess habitat selection on Cibola and Imperial Valley
 - Roost
 - Forage
 - Loafing
- ▶ Assess space use
 - Preliminary data suggest bimodal home ranges on Cibola, near refuge/granary in Imperial Valley
- ▶ Identify migratory pathways, stop-over, staging areas and breeding territories



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