2021 Northern Harrier (*Circus hudsonius*) Surveys Across Western San Diego County

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Photo by Loren Merrill
Overview

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Background: Rationale for Surveys

• Historically, northern harriers (NOHA) were common throughout San Diego County
• NOHA population has been declining across North America, most rapidly in southern portions of range, including San Diego County
• Loss of wetlands and grasslands likely largest drivers of decline
• NOHA is now California Species of Special Concern
• SDMMP wants to develop management strategy to facilitate NOHA recovery in western San Diego County; surveys 1st step
Background: Biology and Natural History of NOHAs

• NOHA found throughout North America in grasslands and marshes
• Population in Southern CA/Baja represents southernmost breeding population
• Ground nesters; prefer nesting in vegetation (grasses, rushes, reeds) >1 meter tall
• Territory size highly variable; breeding can be semi-colonial (polygynous) in areas with high food abundance
• Eat small mammals, birds, lizards, snakes, amphibians, and insects
• Nesting typically begins in April/May and can continue into July
Survey Sites

• Site Selection
-Sites on conserved lands that had breeding NOHA records from state and federal agency documents, iNaturalist, eBird, San Diego County Bird Atlas
Survey Sites

- GIS polygons generated for each survey area
- Access permits obtained from land-owners/managers
Field Protocol—Avian Surveys

• Walk survey area using trails/roads or survey from elevated area with good viewshed
• Record presence/absence
• If present look for evidence of breeding (aerial displays, male feeding female/nestlings/fledglings, female carrying nesting material, fledglings)
• If no evidence of breeding, how using habitat
• If evidence of breeding in Round 1 surveys, follow-up surveys to assess breeding success
• Round 2 surveys conducted in June and July to determine if nest still active or if fledglings present in the vicinity of nest
Field Protocol-Habitat Assessment and Threats

• In survey areas with potentially suitable breeding habitat, create subpolygons outlining different areas of suitable habitat

• Enter info on habitat characteristics (e.g. nonnative grassland, emergent vegetation, wild mustard)

• Identify possible threats to NOHA and the habitat: predators, sources of anthropogenic disturbance, presence of invasive plants, risk from ag, etc.

• Take photos of suitable habitat(s)
Survey Results

- Surveys conducted April 25 – July 27, 2021
- 27 survey areas surveyed (+1 addition)
  - 26 had potentially suitable habitat for nesting
- 8 survey areas occupied by NOHA
- 3 survey areas had confirmed nests, 1 had a likely nest*, and 2 had possible nests:
  - Tijuana Estuary had 3 confirmed nests and 1 possible nest
  - Lake Hodges had 1 confirmed nest
  - San Elijo Lagoon had 1 confirmed nest
- 3 nests successful to at least fledgling/big nestling stage
  - Tijuana Estuary 2 nests
  - San Elijo Lagoon 1 nest
Survey Results

- NOHA nests were located in the following vegetation:
  - thick emergent vegetation in a marsh
  - lush tall grass in a floodplain
  - tall nonnative grassland
  - chaparral/coastal scrub
  - disturbed habitat dominated by dead mustard stalks
## Management Recommendations

<table>
<thead>
<tr>
<th>Survey Areas With NOHA but No Breeding</th>
<th>Assessment for Why No Breeding</th>
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</thead>
<tbody>
<tr>
<td>Lower Otay Lakes</td>
<td>Vegetation in most areas too short/sparse for nesting</td>
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<tr>
<td>Otay Mesa/Lonestar</td>
<td>Possible nest activity potentially depredated by common raven (very common in the area); vegetation very dry on plateau and possibly too short in most places</td>
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<tr>
<td>Otay Ranch Preserve (POM)/Salt Creek</td>
<td>Areas of suitable habitat may be too small/narrow</td>
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<tr>
<td>San Diego NWR</td>
<td>Lots of human activity along trails; vegetation dry in most places</td>
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<tr>
<td>San Diego Bay NWR/Otay Valley RP</td>
<td>Nest confirmed by other consult group failed prior to AECOM surveys (close to restoration work); likely nest observed but never located. Many transients, feral animals</td>
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Management Recommendations

• Tall vegetation necessary (60-100+ cm); if area needs to be managed for fire, allow patches to persist unless annual growth rapid enough to meet height requirements
• If using grazers to control vegetation in areas with NOHA, consider goats (less impactful than cattle)
• NOHA likely need minimum suitable breeding habitat size requirements and distance from trees, habitat edges (needs additional study)
• Manage for prey; small mammals (esp voles) likely most important resource for nesting success
• If habitat transitioning to thick scrub, consider rotational system of bush-hogging every few years to maintain open habitat in different stages of growth
Conclusions

• Very few successful NOHA nests in western San Diego County in 2021
• Tijuana Estuary is the most important area for NOHA in western San Diego Co.
• Very dry conditions likely affected prey populations and vegetation condition
• Some potentially suitable areas not used for breeding; why not?
• Further study likely needed:
  - surveys after wet winter
  - prey assessment (esp small mammals)
  - habitat characteristics around nest
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Thank you!

Questions?

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