Maine Research Array: Bird Siting Assessment Approach

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Avian Data on Exposure Recap

Regional Models
- MDAT

Local data
- Northwest Atlantic Catalog

Tracking data
- Non-marine migratory
  - Songbirds
  - Raptors
  - Wading birds
- Marine
  - Colonial nesters
  - Migratory

Coastal use data
- Colonies
- Radar
- Stopover sites

What can you learn from MDAT?
- Spatiotemporal use patterns
- Relative abundance
- Distribution
- Seasonal changes
Avian Data on Exposure: Catalog Data

Northwest Atlantic Seabird Catalog

- Some local data used in MDAT models
- Inconsistent effort
- Old data
- Poor spatial coverage
Step 1: Spatial Assessment with MDAT Model

Spatial Analysis with MDAT
- Currently species are weighed equally
- Will combine based upon vulnerability
- Based upon methods used by Kelsey et al. 2018 and others

Collision
- Avoidance (literature)
- Time in RSZ (Catalog data)
- Flight activity (literature & Catalog)

Displacement
- Avoidance (literature)
- Habitat flexibility (literature)

Population
- Proportion population exposed (MDAT)
- Conservation status, including state Species of Greatest Conservation Need (SGCN)
- Adult survival (literature)

Population Vulnerability (PV) = \( (POP \pm POPu) + (AO \times (POCSpop \pm POCSpopu)) + TS + (BR \times (AS \pm ASu)) \)

Collision Vulnerability (CV) = \( ((NFA \pm NFAu) + (DFA \pm DFAu))/2 + (RSZt \pm RSZtu) + (MACe \pm MACu) \)

Displacement Vulnerability (DV) = \( (MAd \pm MAdu) + (HF \pm HFu) \)

Step 2: Covariate Considerations

Considering relationships
- Physical or environmental factors related to bird relative abundance
- Included in MDAT models

Conflicting & uncertain relationship
- Highly variable by species
- Some relations generally known
- But high uncertainty

Species groups and life cycle
- Seabirds (breeding, wintering, migrating)
- Terrestrial migrants

General heuristics possible for some species
- Further from shore; deeper water
Step 3: Tracking and Other Data

How do we use tracking data?
• Migration routes
• Foraging areas, distance
• Phenology
• Qualitatively validate MDAT
• Presence of species not represented in MDAT (terrestrial migrants and bats)

How do we use colony and other data?
• Potential foraging areas
• Migration routes based upon ecology

Prioritize monitoring for permitting
• Optimized survey methods

Identify data gaps and research questions
• Exposure of terrestrial migrants
• Flight heights and avoidance rates
Questions and Discussion

MDAT analysis approach
- Questions?
- Feedback

Use of covariates
- Key relationships?
- Priority species?

Priority monitoring for permitting
- We have time
- Priority species?

Identify data gaps and research questions
- Priority questions?