Daily movements and local scale habitat characteristics of areas used by wintering Whooping Cranes

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History of Whooping Crane Populations

• Uncommon wetland bird

• Migratory and non-migratory populations

• Population decline due to habitat loss, hunting, and collection

• Recovery efforts

Images courtesy of International Crane Foundation

• Currently 102 individuals

• Successfully breeding but not yet self-sustaining population
  • Nest abandonments
  • Chick mortality
  • Energetics?
Aransas-Wood Buffalo Population Wintering Grounds

Coastal Texas

Blue Crabs

Salt marsh habitat

Image courtesy of International Crane Foundation

Image courtesy of USFWS – Aransas NWR
EMP: Wintering Grounds

• Expanding winter distribution

• Use of agricultural habitats

• Non-territorial
Objectives

- Quantify daily movement on the wintering grounds
  - Home range sizes
  - Distances moved
  - Timing of movements

- Identify local scale habitat characteristics
  - Land cover types
  - Water depth
  - Vegetation height
  - Distance to development
  - Protected area status
Methods – Field data

• 2015 season
  • 20 groups of cranes
  • 6 states
  • 29 Dec 2014 – 1 Feb 2015

• 2016 season
  • 23 groups of cranes
  • 8 states
  • 2 Jan 2016 – 12 Feb 2016
Methods – Field data

- 2015 season
  - 20 groups of cranes
  - 6 states
  - 29 Dec 2014 – 1 Feb 2015

- 2016 season
  - 23 groups of cranes
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Methods – Field data

• Radio telemetry and observations
  • One full day per group
  • Data point every 30 minutes
  • Location, behavior, habitat data
    • General and specific habitat type
    • Vegetation height
    • Water depth
• Random points to compare to used locations with logistic regression
Methods – Data Layers

• Habitat characteristics
  • National Land Cover Dataset – Multi-resolution Land Characteristics Consortium

• Protected land?
  • Protected Areas Database - USGS

• Distance to roads
  • USA Major Roads - ESRI, TomTom
Daily Movements

- Home Ranges
  - 2015: 3.6 km\(^2\) KDE
  - 2016: 4.1 km\(^2\) KDE
- Average distances moved
  - 8.4 km in one day
- Maximum distance from roost
  - 10.9 km
- Timing of movements
Daily Movements

Average distance cranes move throughout the day

Distance (km)

Hour of the day

6 7 8 9 10 11 12 13 14 15 16 17 18 19
Local scale habitat characteristics

- **Observed Variables**
  - Habitat types
  - Water depth and vegetation height

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<th>Habitat Type</th>
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1. Cultivated Crops
2. Open Water
3. Grassland/Herbaceous
4. Wetland Emergent Herbaceous
Local scale habitat characteristics

• Variables
  • Land Cover Class
  • Protected area
  • Distance to Roads

• Future analysis
  • Include Topographic Wetness Index or some measure of potential for an area to be flooded
Summary

- Expanding winter range
  - Using more northern areas in recent years
- Daily home range sizes similar to breeding areas
  - 3.6 – 4.1 km$^2$
- Daily movements
  - About 8.4 km per day, up to 10.9 km from roost
  - Move more in the beginning and end of day
- Habitat Characteristics
  - Use of cultivated crops, open areas with shallow water and short vegetation
  - Preference for protected areas
Conclusion

• What does this mean for land managers and reintroduction efforts?
  • Understanding home range size and movements gives us an idea of the size of an area to protect or restore
  • Local scale habitat characteristics inform land managers, energetics research, and future management decisions for the population
Thank you! Questions?

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