Boom or Bust: How Waterfowl Respond to Varying Water Levels of the Great Salt Lake

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Significance of GSL for Waterfowl

• 5-8 million waterfowl pass through Utah annually
  – Staging Area (5-8 million)
    • Spring Migration (March - May)
    • Fall Migration (September - November)
  – Breeding Area (200,000)
    • Mallard, Cinnamon Teal, Gadwall, Redhead, Canada Geese (June - August)
  – Wintering Area
    • 10,000-100,000 Ducks; 3,000-10,000 Geese; 5,000 Swans (December - February)
Important Areas

- **Eastern Shore (~90% use)**
  - Bear River Bay
  - Ogden Bay
  - Farmington Bay

- **Causeway, Brine Line (~5%)**
  - Diver Species
  - Northern Shovelers
  - Green-winged Teal

- **Lake Proper (~5%)**
  - Common Goldeneye
  - Northern Shovelers
  - Green-winged Teal
Factors Influencing Waterfowl Use

• Weather Patterns
  – Fall Migration:
    • September - November
    • Fledging...Ice/Cold
  – Spring Migration
    • March - May
    • Ice/Cold...Need to Breed
Weather Influence on Swan Abundance

![Graph showing swan abundance over time with peaks in November for both 2014 and 2017.]
Factors Influencing Waterfowl Use

• Weather Patterns
  – Fall Migration:
    • September - November
    • Fledging...Ice/Cold
  – Spring Migration
    • March - May
    • Ice/Cold...Need to Breed

• Water
Great Salt Lake Water
Annual Lake High Elevations

<table>
<thead>
<tr>
<th>Year</th>
<th>Elevation (Feet Above Sea Level)</th>
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<tbody>
<tr>
<td>1910</td>
<td>4,190</td>
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<tr>
<td>1918</td>
<td>4,198</td>
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<td>1926</td>
<td>4,205</td>
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<tr>
<td>1934</td>
<td>4,213</td>
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<td>1942</td>
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<td>1950</td>
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<td>2006</td>
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<tr>
<td>2014</td>
<td>4,220</td>
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Fresh Water = Waterfowl Habitat

Above 4,200

Below 4,200
Fresh Water = Waterfowl Habitat
Low Water Issues

• Birds Migrate South Earlier
  – Fewer birds prior to freeze up
  – Less feed on the lake
  – Poor body condition
• Winter Survival
• Breeding Success
Low Water Issues

• Birds Migrate South Earlier
• Fewer Breeding Waterfowl
  – Site selection based on water
  – Less available nesting areas
• Increased competition
• Fewer nesting birds
Low Water Issues

- Birds Migrate South Earlier
- Fewer Breeding Waterfowl
- Most Feeding Occurs on Interior Marshes
  - Available food runs our quickly
  - More nocturnal feeding
  - Lake becomes mostly resting area
Low Water Issues

- Birds Migrate South Earlier
- Fewer Breeding Waterfowl
- Most Feeding Occurs on Interior Marshes
- Swans Distribution Changes
  - Swans only found in areas with summer water
    - Submergent Vegetation
      - Almost exclusively on interior marshes
Low Water Issues

- Birds Migrate South Earlier
- Fewer Breeding Waterfowl
- Most Feeding Occurs on Interior Marshes
- Swans Distribution Changes
- Increased Competition for Resources
  - Food availability limited (submergent)
  - Impacts continental waterfowl populations
Concerns for Future

• As water level lowers, will fewer birds migrating through GSL???
  – Continental population increases, few species increasing here (ex. White-fronted geese, light geese)
  – Changes in migration patterns (fall light geese)
Concerns for Future

• As water level lowers, will fewer birds migrating through GSL???

• Loss of important staging area for PF birds
  – Many species depend on GSL wetlands (ex. tundra swans, northern pintails)
Concerns for Future

• As water level lowers, will fewer birds migrating through GSL???

• Loss of important staging area for PF birds
  – Several species depend on GSL wetlands (ex. tundra swans, northern pintails)
  – Millions of birds depend on GSL for resources
    • Increases pressure on habitat in traditional wintering areas
    • Impacts body condition of birds
Thank You