

A photograph of a large group of waterbirds, likely Goldeneyes, swimming on the Great Salt Lake in Utah. The birds are scattered across the blue water, with some in the foreground and others further back. The text is overlaid on the top half of the image.

Wintering Waterbird Ecology on the Great Salt Lake, Utah

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Introduction

- Great Salt Lake (GSL) is a unique and important ecosystem



Introduction

- GSL is host to abundant invertebrate populations
- Brine Shrimp
- Brine Flies
- Corixids



Introduction

- GSL host to diverse migratory bird populations

American Avocets
SWBirders, Apr 03
©Henry Detweiler

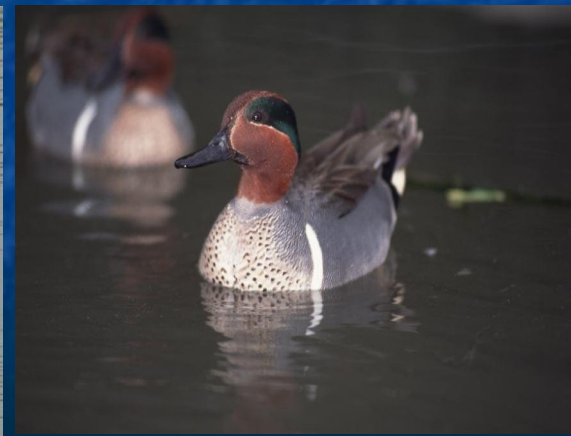


White-faced Ibis
©Henry Detweiler, Apr 03



Introduction

- Western Hemispheric Shorebird Reserve
 - Cross-roads of the West
- Most management and research efforts focused on migratory and breeding periods
- Little information on GSL winter residents



Introduction

- Anecdotal reports of waterbirds foraging on brine shrimp cyst streaks
- However, abundance and foraging relationships not adequately quantified



Introduction

- GSL supports a large commercial brine shrimp industry
 - High hatchability
 - > 3.5 million kg of cysts harvested annually 1985-2000
- UDWR suspends harvest when < 21 cysts/liter



Introduction

- Goal of UDWR is to refine cut-off point to account for:
 - Environmental variables
 - Shrimp biology
 - Abiotic factors
 - Requirements of the avian community
- Eared grebe requirements during fall have recently been quantified



Objective 1

Estimation of Waterbird Abundance

- Aerial Surveys
 - November-April
- Stratified Random Sampling
- Transects 500m apart
- Randomly select transects for each survey



Objective 2

Nutrient Reserve Dynamics

- Influence reproductive success
 - Inverse relationship between reduced food availability and subsequent reproduction
- Reduced body mass during winter may negatively influence survival probabilities



Objective 2

Nutrient Reserve Dynamics

- Focus on Common Goldeneye, Northern Shoveler, Green-winged Teal
- Collect waterbirds from GSL winter-early spring
 - 3 collection periods/yr
 - Early winter
 - Mid-winter
 - Late winter-early spring



Objective 3

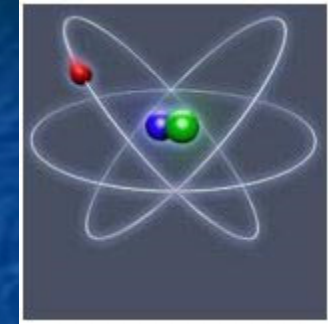
Food Habits

- Utilize birds collected in Obj. 3
- Remove GI tract
 - Ingesta items sorted, identified, and quantified



Objective 3

Food Habits



- Stable Isotope Analysis
 - Determine relative contributions of isotopically distinct foods to diet
 - saline vs. freshwater; plant vs. animal
 - Collect potential waterfowl foods from GSL and associated marshes to acquire isotopic signatures
 - Invertebrates (brine shrimp, flies, corixids)
 - Plant (seeds, tubers)
 - Submit muscle and liver tissues obtained from waterbirds in Obj. 2 for isotopic analyses

Objective 4

Caloric Value of Prey Items

- Items identified in Obj. 5
- Bomb calorimetry to determine caloric content (kJ/animal) and concentration (kJ/gram)



Update

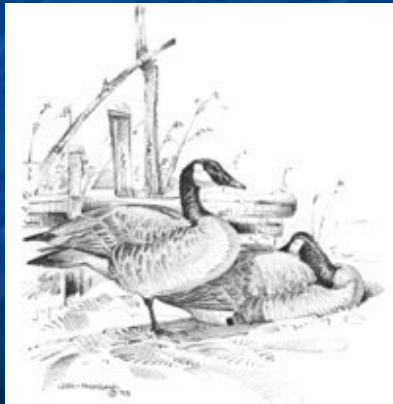
- Near completion of first field season
- Begin necropsy and laboratory work in May
- Preliminary report by September 2005
- Final field season Nov 2005–March 2006
- Final report due May 2007



Acknowledgements



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Questions ?

