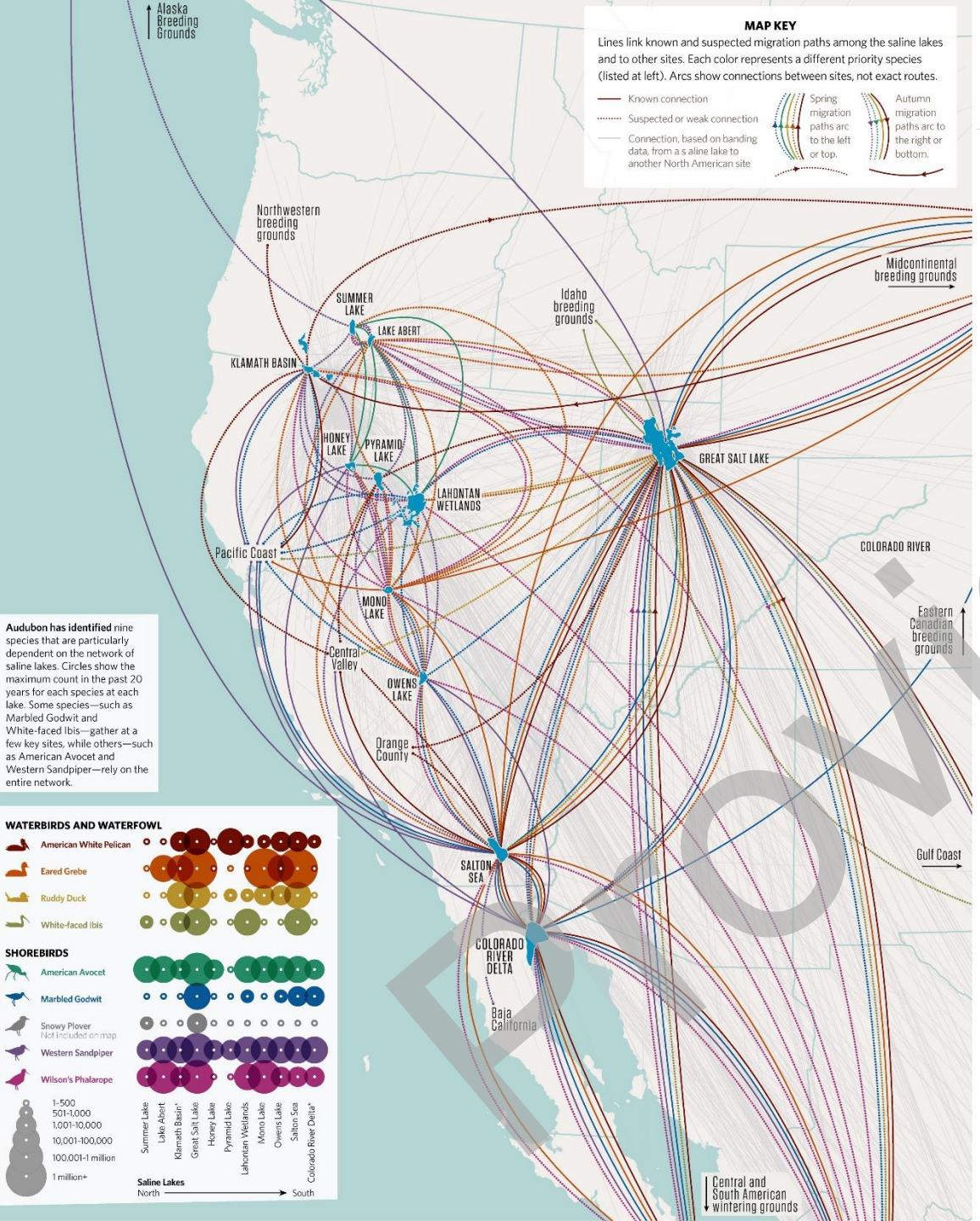
Bird Trends and Hydrology

A COLLABORATIVE STUDY AT GREAT SALT LAKE

APRIL 29, 2021

Steve Torna/Audubon Photography Awards



Saline Lakes Program

- Saline lakes and their wetlands provide an irreplaceable habitat network
- Support **globally** significant populations of birds
  - 99% North American Eared Grebes
  - ~90% Wilson's Phalaropes
  - >50% American Avocets
- Critically important to shorebirds
  - **Almost 70% decline since 1973**
- Saline Lakes have **shrunk by 50-95%** over the past 150 years

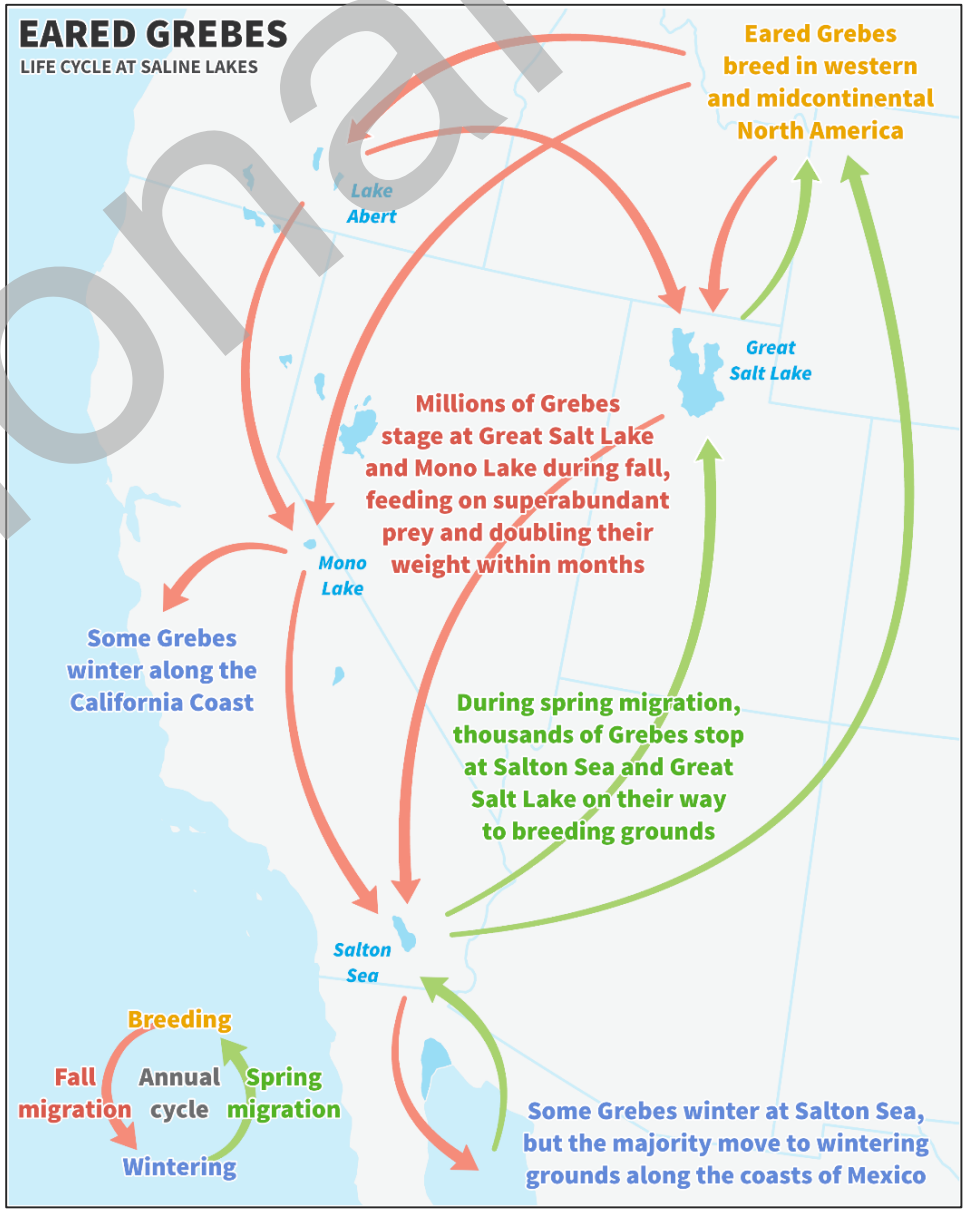
Our Program's Vision:

Healthy saline lake ecosystems with reliable water supplies to sustain birds and people

Saline Lakes Program

- How much water is needed? When? Where?
- Challenges
  - Balance competing species needs
  - Multiple sites and seasons
- Bird and water data needs:
  - Amount, location, timing

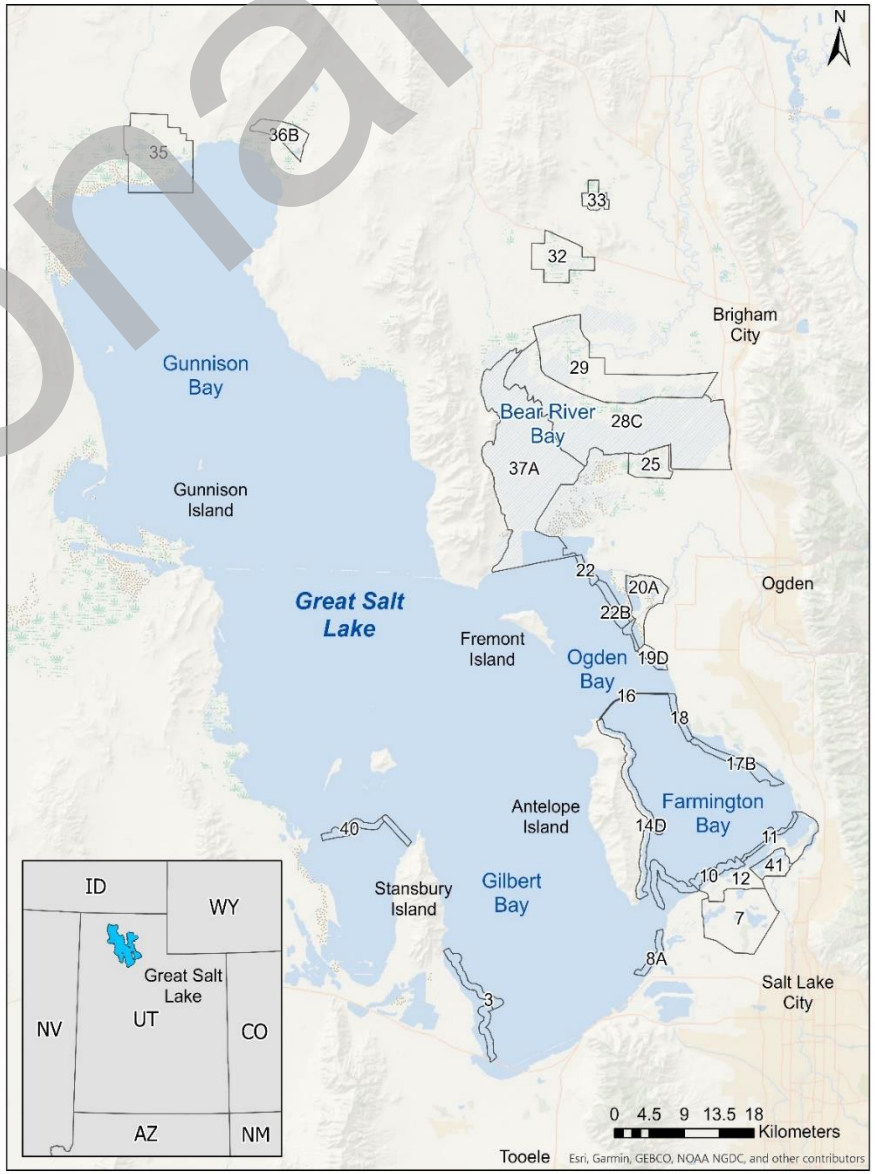
Eared Grebe
Peter Knoot/Audubon Photography Awards

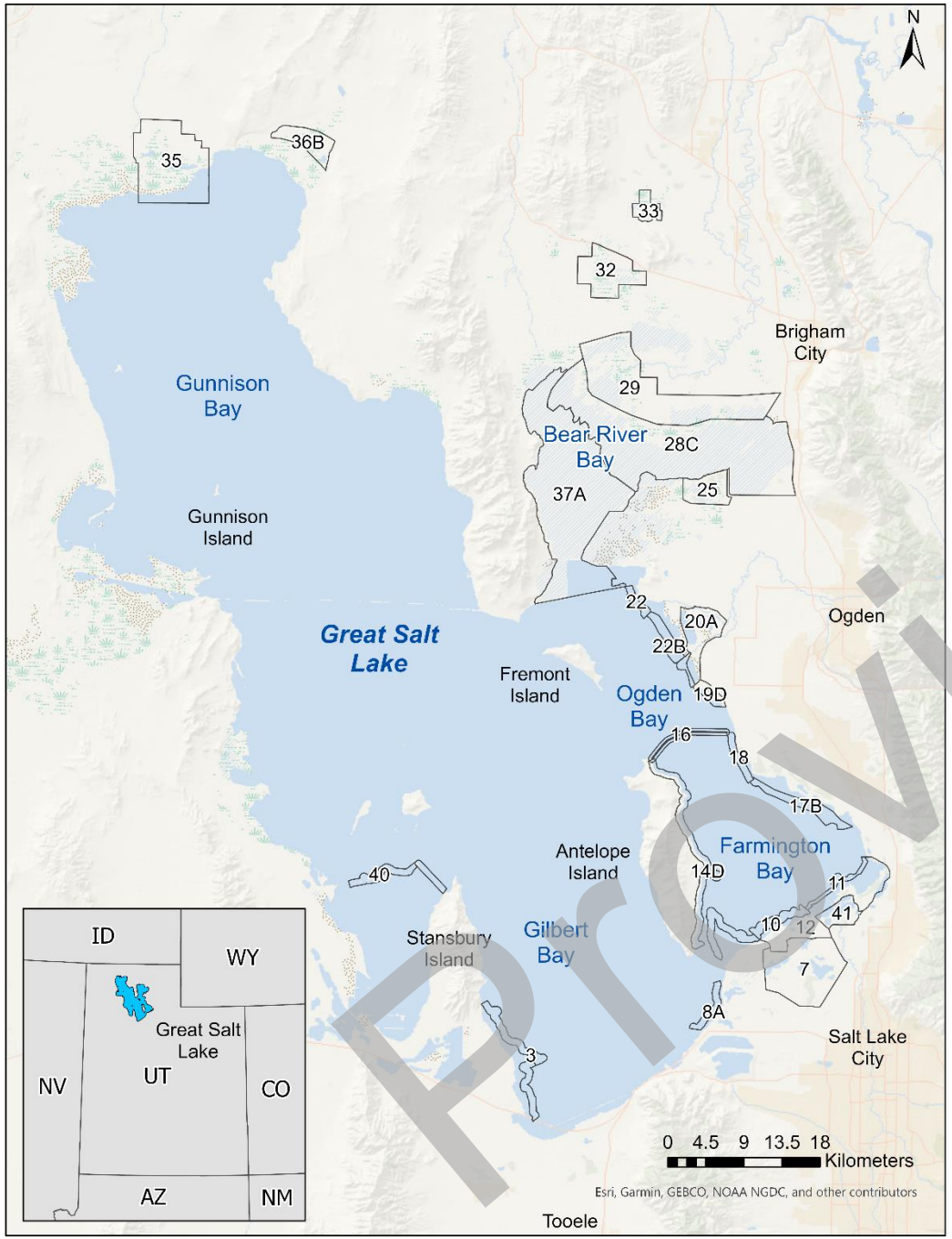


Credit: Lotem Taylor, National Audubon Society

Birds and Habitats at Great Salt Lake

- Great Salt Lake Ecosystem Program (GSLEP)
  - Utah Division of Wildlife Resources
  - Annual surveys in 24 areas; beginning in 1997
  - Document species, counts, locations, and periods of use
- GSLEP and Audubon entered into data sharing agreement in fall of 2018
  - Data standardization
  - Trends in species counts
  - Relate to surface water inflows and lake level





Audubon

Monitoring data

- Spatial:
  - 24 survey units
- Temporal:
  - 1997 – 2017
  - 2 Spring; 3 Fall
- Taxonomic:
  - 30 species
  - 7 groups

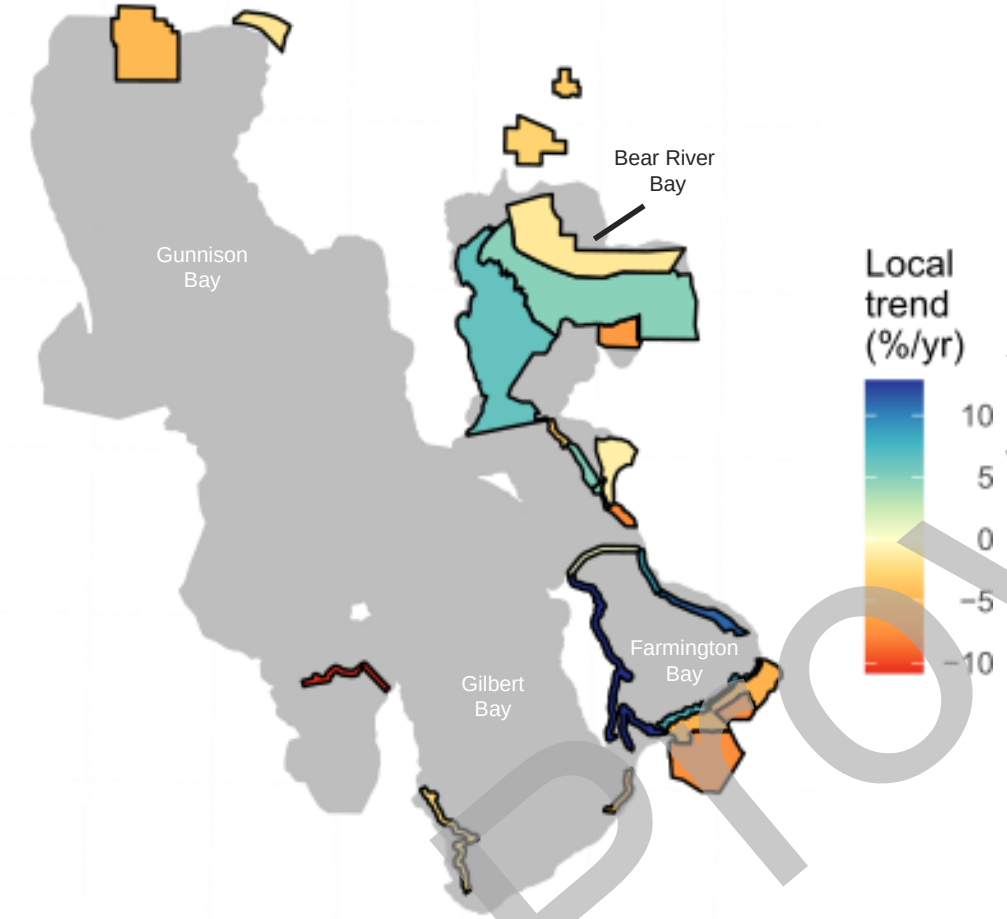
Trends analyses

- Aggregate and locals trends
- Statistical analysis
  - Mixed-effects models
  - Bayesian fitting

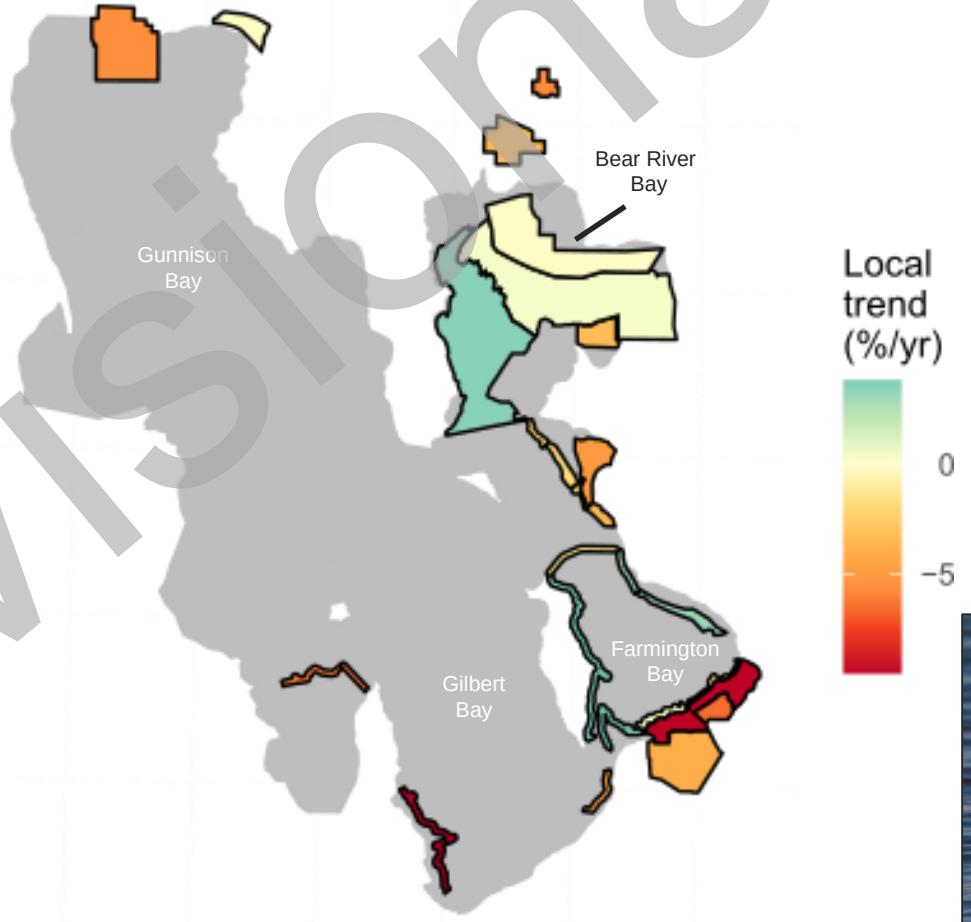
21-Year Trends (1997 – 2017) at Great Salt Lake

Audubon

Apr/May



Jul/Aug



Individual Wetlands

American Avocet
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21-Year Trends (1997 – 2017) at Great Salt Lake

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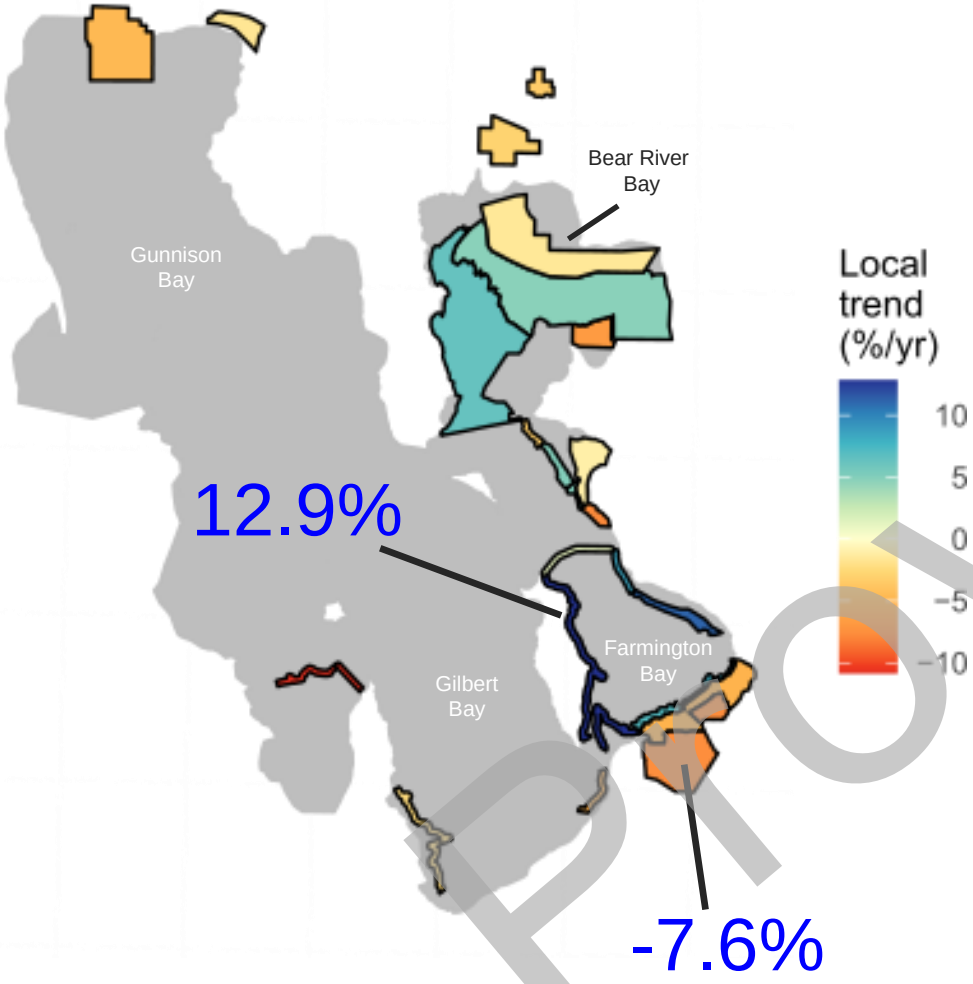

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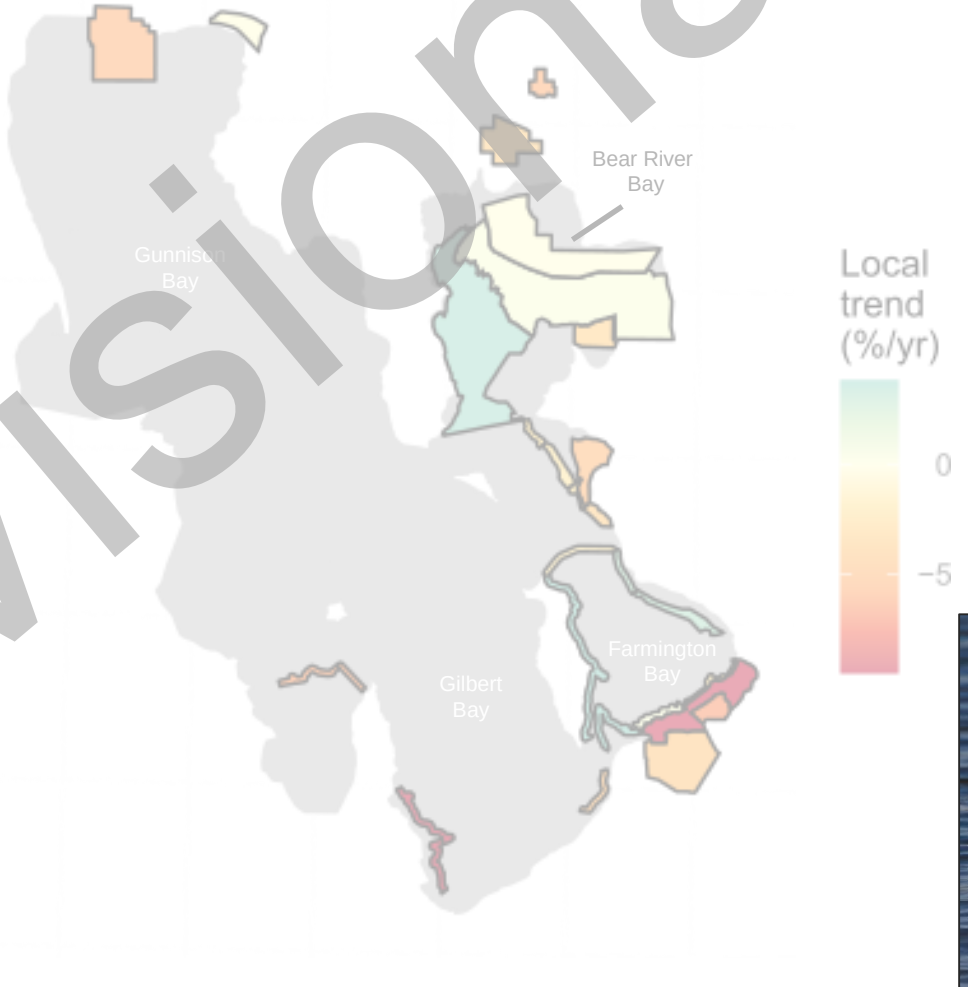

Individual Wetlands

American Avocet
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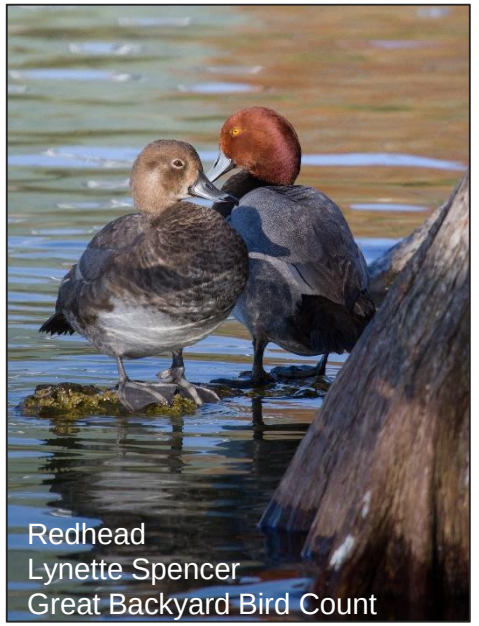
All 24 Survey Units at Great Salt Lake

Number of Species or Groups

	Spring	Fall
Increase	14	4
Stable	23	32
Decrease	0	1



Redhead
Lynette Spencer
Great Backyard Bird Count

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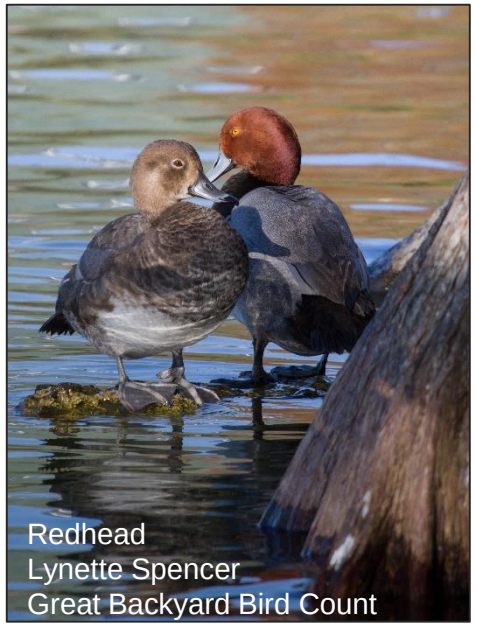
All 24 Survey Units at Great Salt Lake

Audubon

Number of Species or Groups

-7.4 to 13.5% yr^{-1}	Spring	Fall
Increase	14	4
Stable	23	32
Decrease	0	1



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Lynette Spencer
Great Backyard Bird Count

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Discussion

- We identified:
  - Priority areas for species
  - Priority species for areas
- Overall stable or positive trends
  - Only specific areas covered (not lakewide)
  - High quality habitat
  - Need regional context
- Maintaining species requires:
  - Setting explicit population and habitat objectives
  - Addressing habitat factors that limit species population


Long-billed Curlew
Stephen Pollard
Audubon Photography Awards


Northern Shoveler
Gerald Lisi
Audubon Photography Awards

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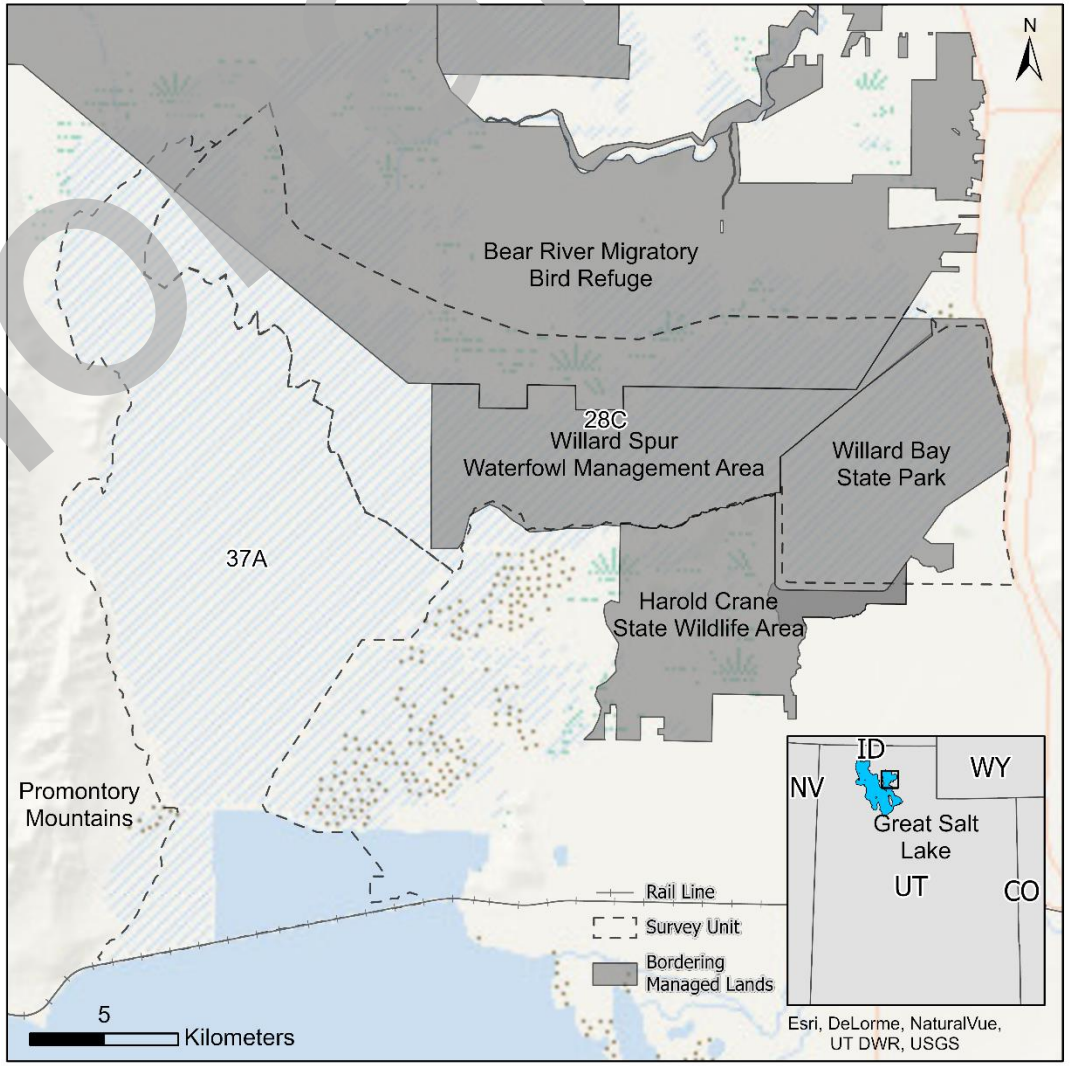
Hydrology and Birds

- Water quantity and quality affects birds
  - Formation of land bridges
  - Salinity effects on food resources
- Water resource affected by:
  - Climate change
  - Water use
- Tools required to evaluate:
  - Development and climate change effects
  - Conservation and management effectiveness

Black-necked Stilt
Linda Mac Millan
Audubon Photography Awards

Bear River Bay and Hydrology at Great Salt Lake

- Globally Important Bird Area
  - 14 species (>1% of population)
  - ≥ 20,000 waterbirds
- Surface water inflows:
  - USGS gage @ Corinne
  - Willard Bay Reservoir releases
  - POTW discharges
- Great Salt Lake elevation:
  - USGS gage @ Saltair



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Bird Responses to Bear River Bay Hydrology

Audubon

Spring

- Black-crowned Night-Heron
- Caspian Tern
- Forester's Tern
- Northern Pintail
- Cinnamon Teal
- Gadwall
- Long-billed Curlew
- Sandhill Crane
- Willet

Caspian Tern
Sharon Milligan
Great Bakcyard Bird Count

Fall

- American Avocet
- American Coot
- American White Pelican
- American Wigeon
- Black-crowned Night-Heron
- Canada Goose
- Cinnamon Teal
- Double-crested Cormorant
- Eared Grebe
- Egrets
- Forester's Tern
- Franklin's Gull
- Gulls
- Mallard
- Northern Pintail
- Redhead
- Ruddy Duck
- Sandpipers
- Western/Clark's Grebe
- White-faced IBIS
- Killdeer

American Wigeon
Laura Frazier
Great Backyard Bird Count

Black-crowned Night-Heron
Jessica Fox
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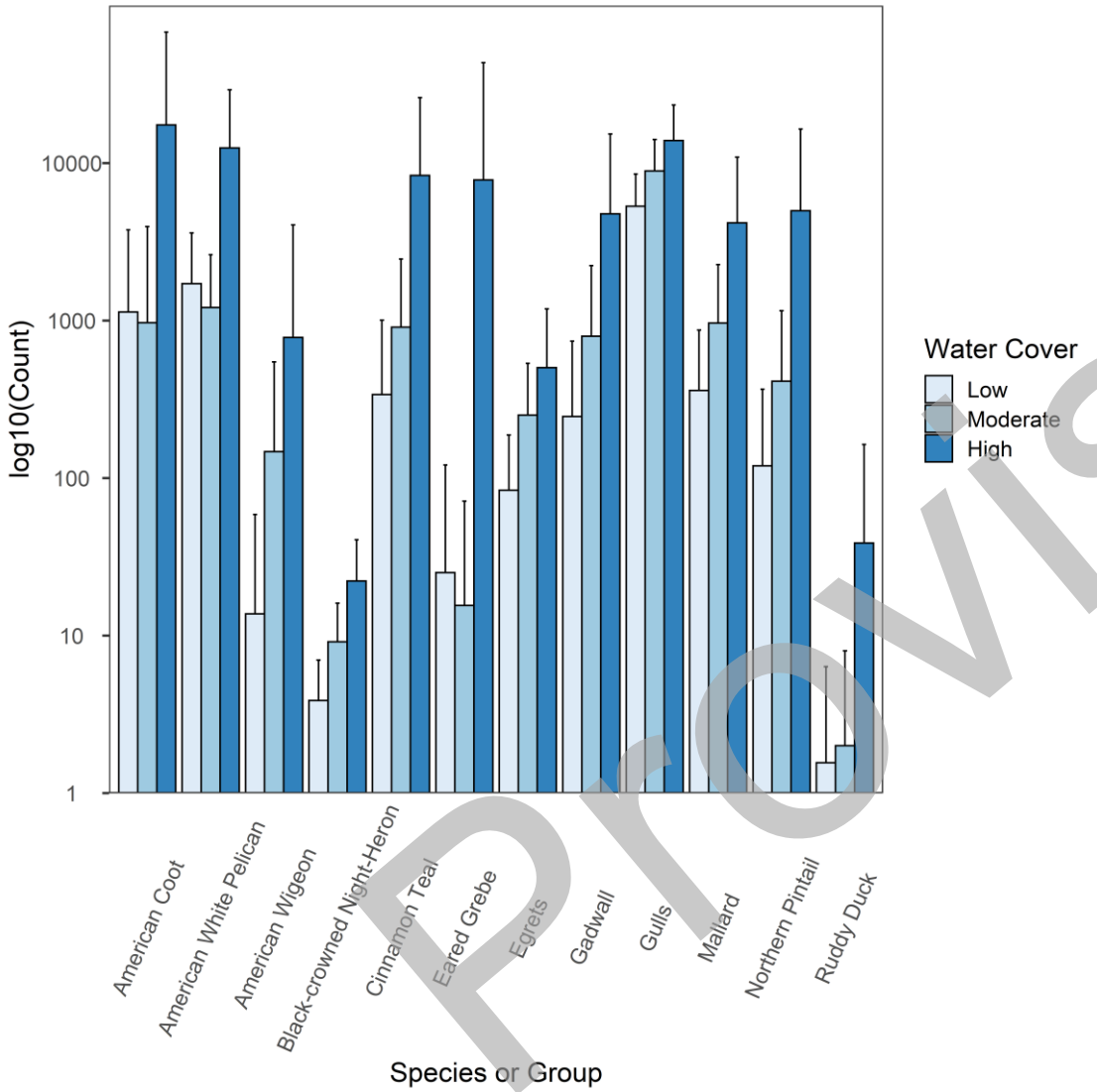
Bird Responses to Bear River Bay Hydrology



High Moderate

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Discussion

- We identified:
  - Positive fall responses
  - Mixed spring responses – foraging habitats?
- Tools for addressing effects of climate and water use
  - Utah Division of Water Resources models
  - More frequent and severe detrimental conditions (?)
- Need for ongoing and enhanced monitoring:
  - Bird and additional habitat metrics
  - Are birds running out of options across the region?

Dunlin, Western Sandpiper, Willet
Photo: Jean Hall
Audubon Photography Awards

White-faced Ibis
Christopher Elliott
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