Cutler Reservoir – Amalga Barrens: an IBA of Global Significance for White-faced Ibis

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Photo courtesy Don Fiesinger

Important Bird Areas

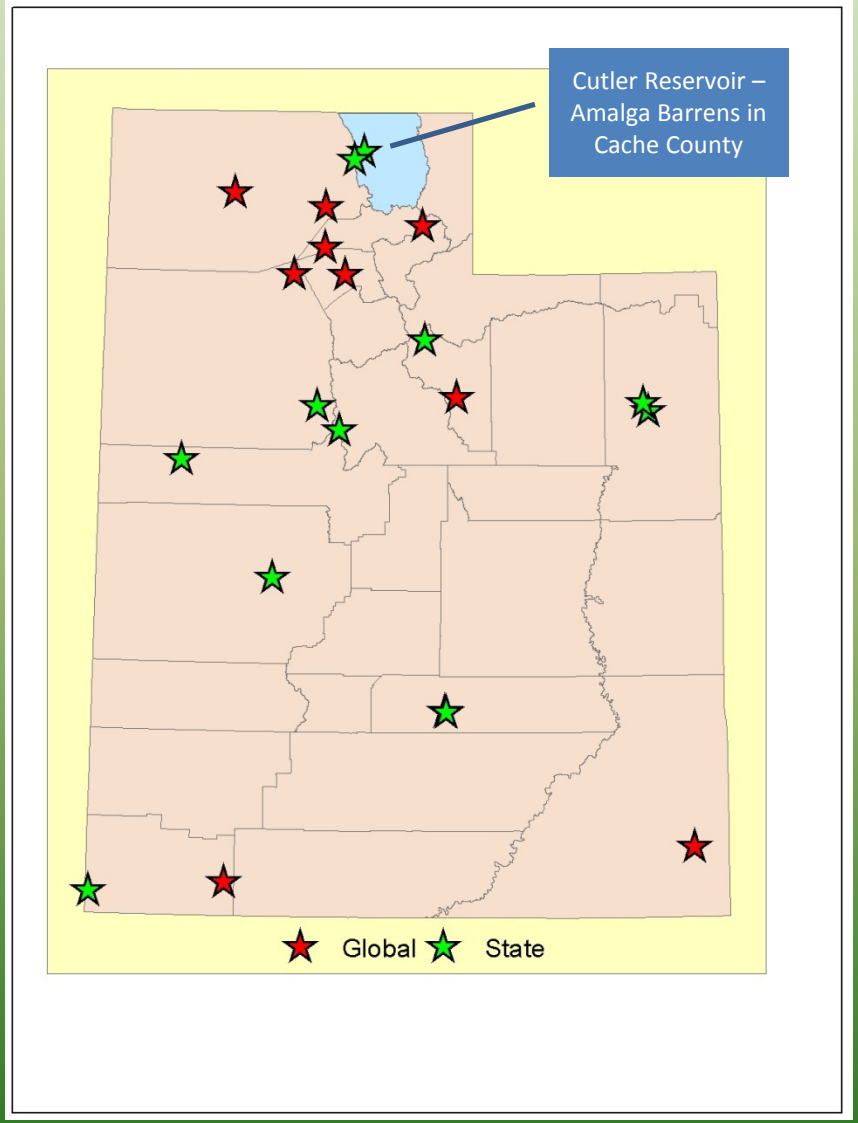
- Conservation program begun by Birdlife International in 1980s
  - "To identify, monitor and conserve a network of sites to help maintain naturally occurring bird populations for which a site-based approach is appropriate." (Evans and Martinson, 2008)
  - >10,000 sites
  - 178 countries
- United States: administered by National Audubon Society since 1995, with IBAs in 47 states
- Public and private lands
- No forced protections or regulation, rather designation seeks recognition and voluntary protections for avian habitat

IBAs in the United States

Summary of U.S. Important Bird Areas		
IBA Priority	Number of IBAs	Acres encompassed
Global	406	236,775,785
Continental	15	4,319,674
State	2,086	141,320,555
Total	2,507	382,416,014
Source: National Audubon Society		

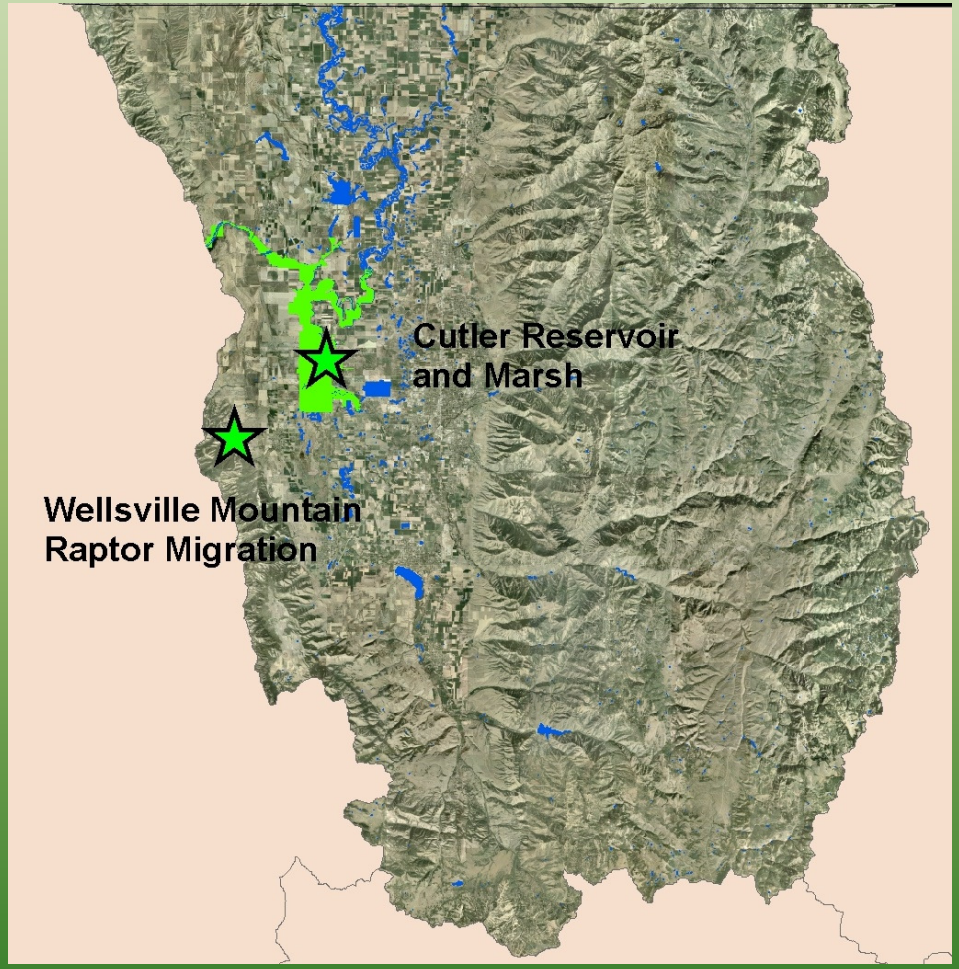
Utah IBAs

- Program initiated 2001
- First designations established 2003
- Currently 21 in Utah
  - 9 Global significance
  - 12 State significance



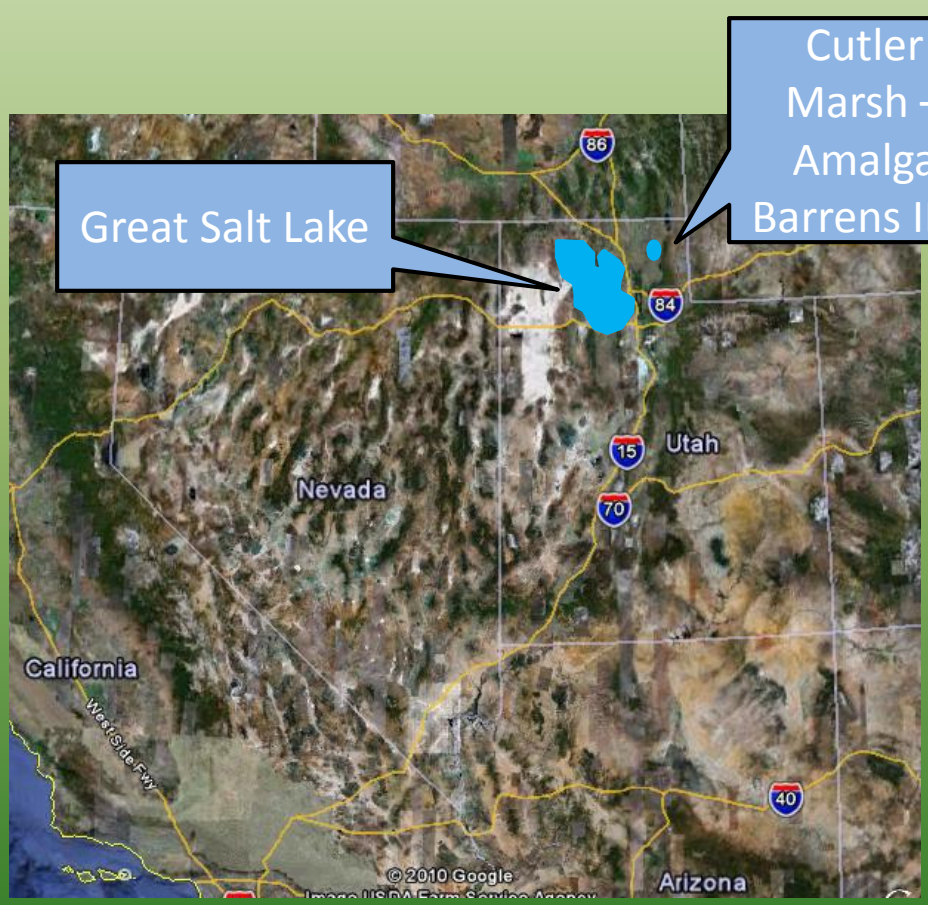
Cutler Marsh – Amalga Barrens IBA

- One of two in Cache County designated in 2005
- Surrounding a reservoir in the valley bottom, 4,400 ft elevation
- Habitats: open water, emergent marshes, wet meadow, grassland, riparian, playas, mudflats



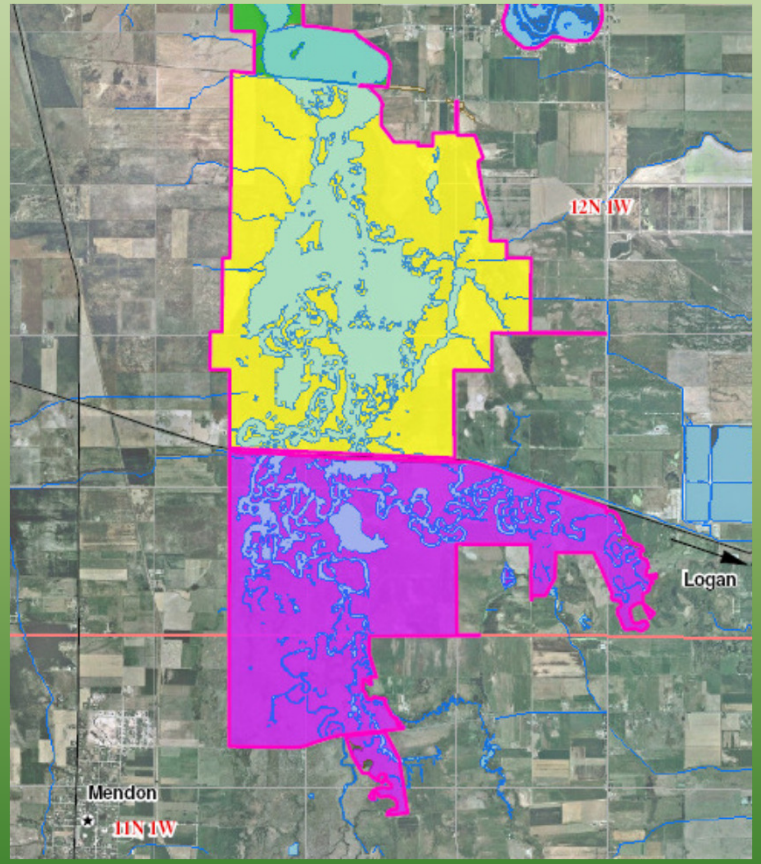
Cutler Marsh – Amalga Barrens IBA

- Eastern edge of Great Basin
- Freshwater
- Similar to wetlands around Great Salt Lake, but ~300 feet higher elevation



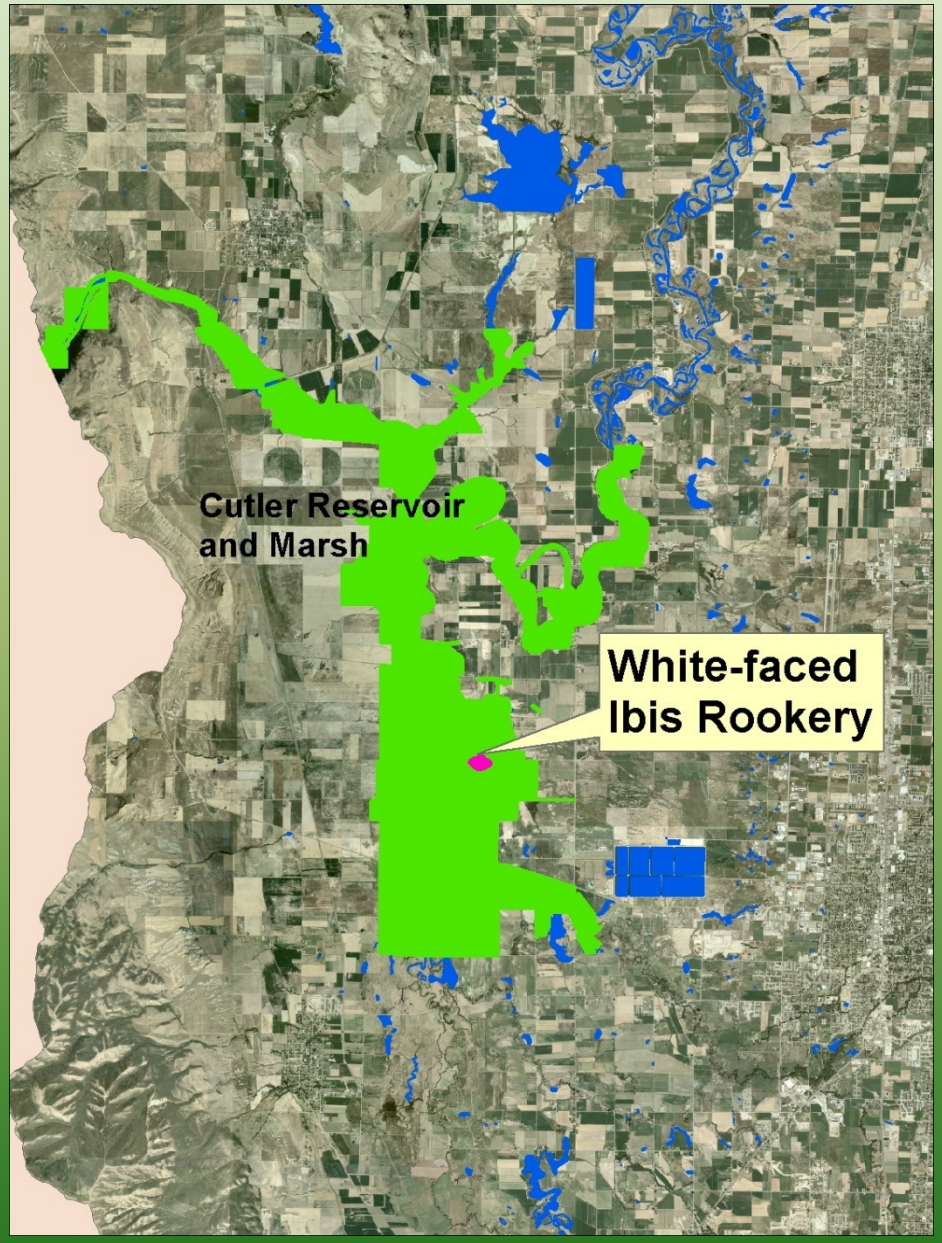
Ownership and Management

- PacifiCorp Energy – 9,700 ac
  - Resource Management Plan 1995
  - South Marsh: Wildlife habitat, low-impact recreation, wake-less speeds, and low-hp motorboats, personal watercraft forbidden
  - Utah Division of Parks and Recreation concurred with PacifiCorp Recreation Policy in 2007
- Utah Division of Wildlife Resources Bud Phelps Wildlife Management Area – 150 ac
- Bridgerland Audubon Society's "Barrens Sanctuary" – 146 ac acquired through Intermountain West Joint Venture grant; managed for shorebirds



Birds

- Bridgerland Audubon Society
  - > 140 species birds
  - Christmas Bird Count since 1955
- Utah DWR "sensitive species"
  - American white pelican
  - Short-eared owl
  - Long-billed curlew
- Utah Partners in Flight "priority species":
  - American avocet
  - Black-necked stilt
  - Osprey
- Rookery sites for great blue herons, snowy and cattle egrets, Franklin's gulls, white-faced ibis



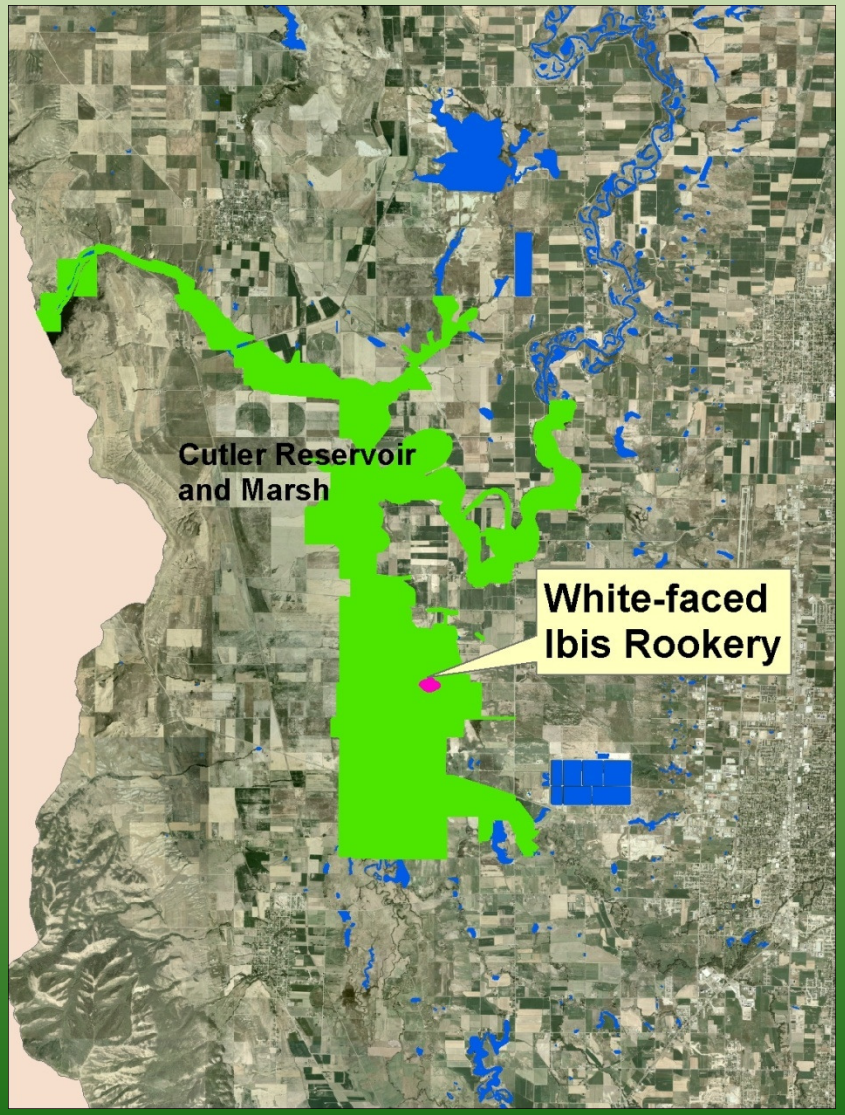
White-faced Ibis

- Great Salt Lake
  - Bear River Bay IBA of Global Significance
  - 57,615 ibis documented
  - Up to 10,000 ibis in rookeries at Bear River Migratory Bird Refuge
- Cutler Marsh – Amalga Barrens
  - Local birders noted large rookery established after GSL flooding in mid-1980s – Critical refuge during climatic variations
  - NAS requested more extensive census to qualify Cutler Marsh as IBA "of Global Significance"


Photo courtesy Don Fiesinger

White-faced Ibis Rookery at Cutler Marsh

- April-early May: Ibis arrive
- Rookery occupied May-July
- Typical diurnal pattern – feed in wet meadows during day, return to rookery at dusk



IBA Categories

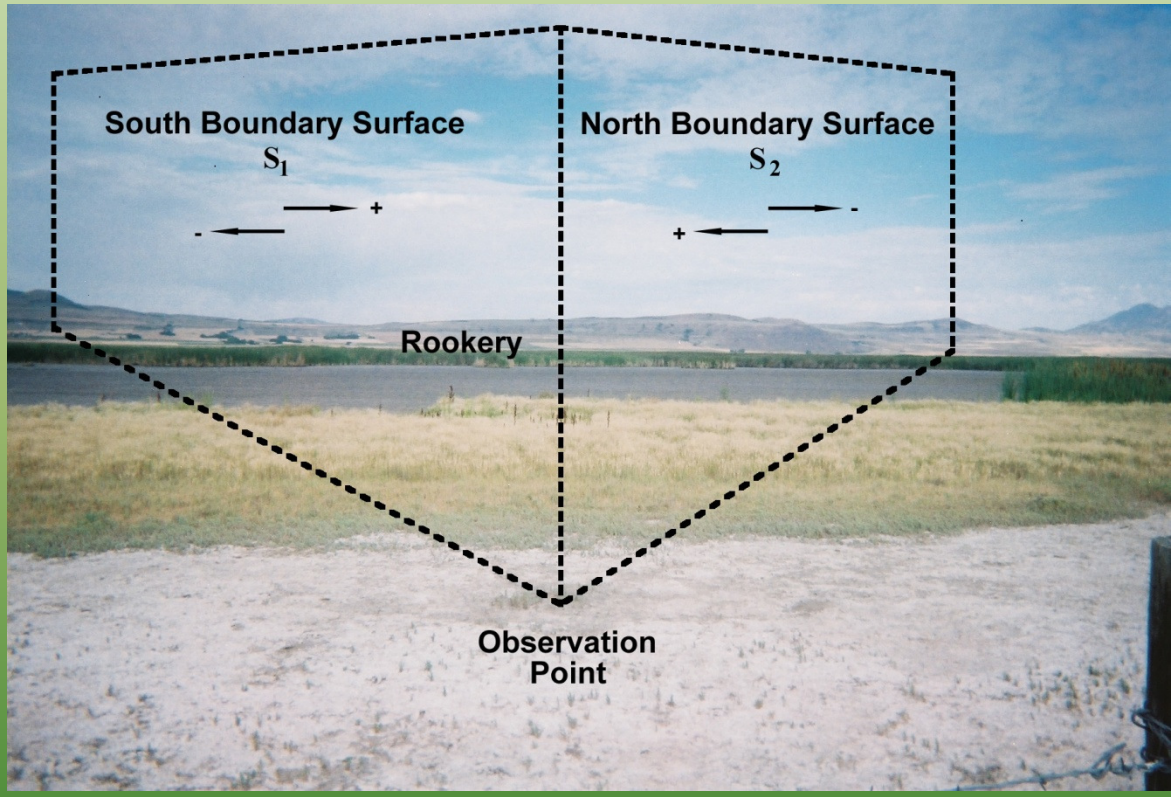
- State – Continental – Global
- Cutler Marsh – Amalga Barrens State IBA
  - D1: State Species of Conservation Concern
  - D4iii: Wading birds
- Global
  - A4i: ≥1% biogeographic (N. Am.) population of a waterbird simultaneously; ≥5% over a season
    "The number of individuals of a species in roosts, breeding colonies, feeding flocks or at a migratory stopover site regularly meets or exceeds 1% of the North American population 'simultaneously'."
- Ibis populations in North America estimated >150,000 by NAS – needed to document >1,500

Census Protocol

- Dates: Early May-early July
- Measure flux rather than occupancy to avoid disturbance during nesting season

Protocol

- Observe from land
- Evenings until after sunset – 7:00-9:30 p.m.
- Establish south and north planes
- North observer sweep to count birds in flight over rookery
- Count bird flux (crossing imaginary plane)
- Subtotal at 15 minute intervals
- End time determined by visibility

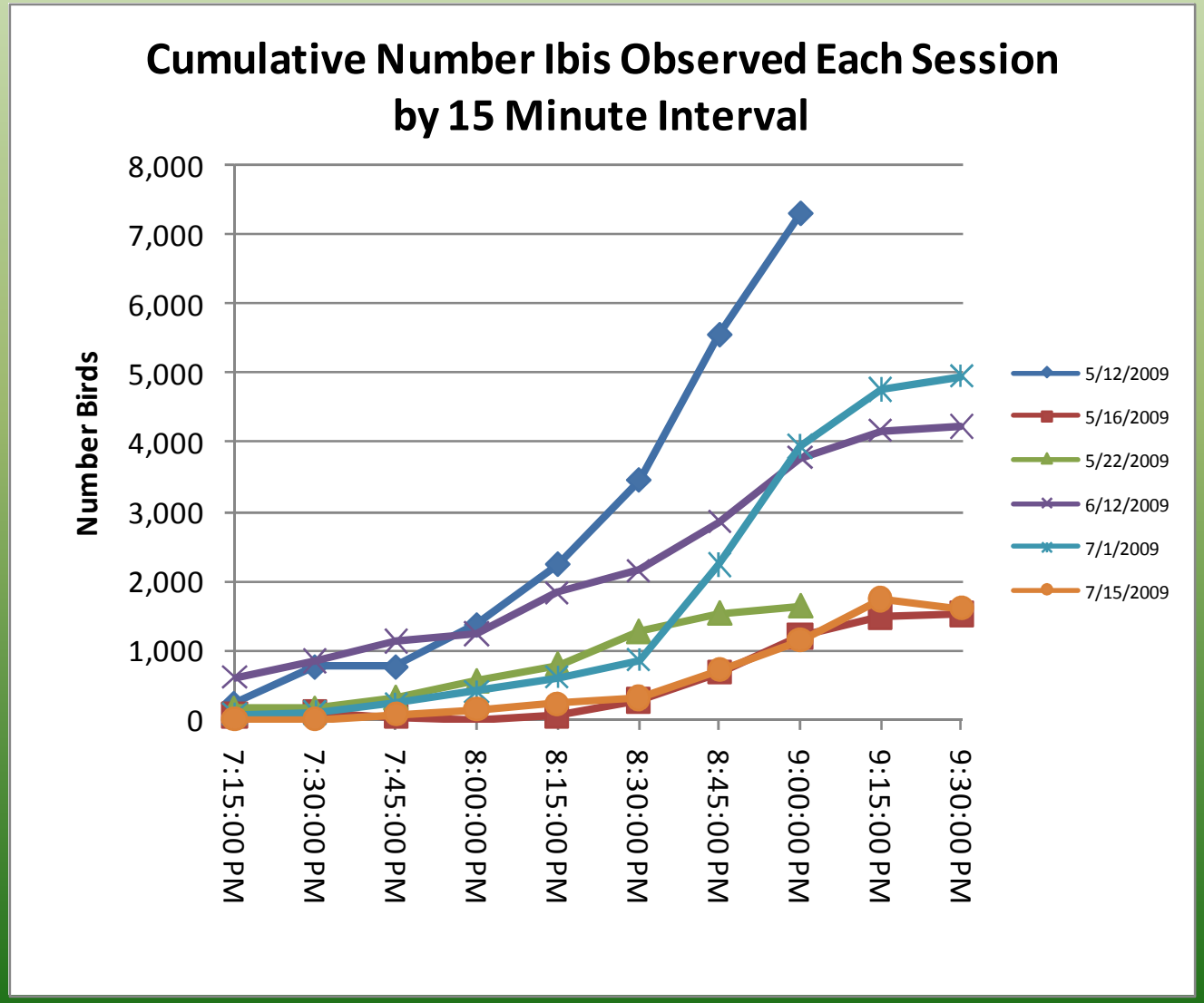


View west from the observation point toward the rookery with Wellsville and Malad mountain ranges in the background.

Annual Data

	May		June			July	
Year	**Mid**	**Late**	**Early**	**Mid**	**Late**	**Early**	**Mid**
2005	5,902	6,134					
2006	5,268		8,094	3,851	4,074		
2007			-				
2008	1,683		239	1,237			
2009	7,311	1,526		4,230		4,959	1,601
2010		3,158		501	1,695		

Daily Fluxes

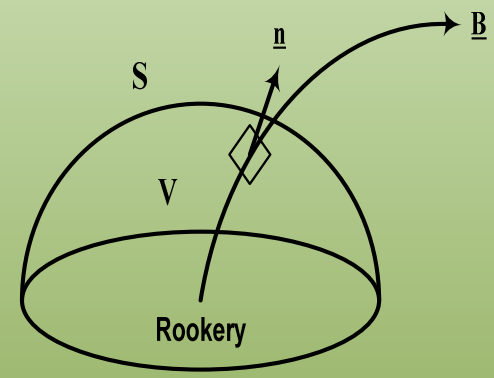


Theory in Mathematical Terms

Φ_B = **the flux of birds out of volume** $\mathbf{V}$ **(birds/s)**

$$\Phi_B = \iint_S \underline{\mathbf{B}} \cdot \underline{\mathbf{n}}\, d^2r \qquad \textbf{(3.)}$$

This is the definition for the "flux of vector field B"



N = **the total number of birds inside volume** $\mathbf{V}$

$$\mathrm{N} = \iiint_V \rho\, d^3r \qquad \textbf{(4.)}$$

This is the definition for the "number density"

Using Equations (1.) through (4.) :

$$\Phi_B = \iint_S \underline{\mathbf{B}} \cdot \underline{\mathbf{n}}\, d^2r = -\frac{\partial}{\partial t}\iiint_V \rho\, d^3r = -\frac{\partial N}{\partial t} \qquad \textbf{(5.)}$$

i.e. the time rate of change of the number of birds inside volume $\mathbf{V}$ **is equal to the flux of birds through the bounding surface** S**, which is also equal to the time rate of change of the volume integral of the number density.**

This provides a rigorous mathematical basis through which the survey measurements have been mechanized.

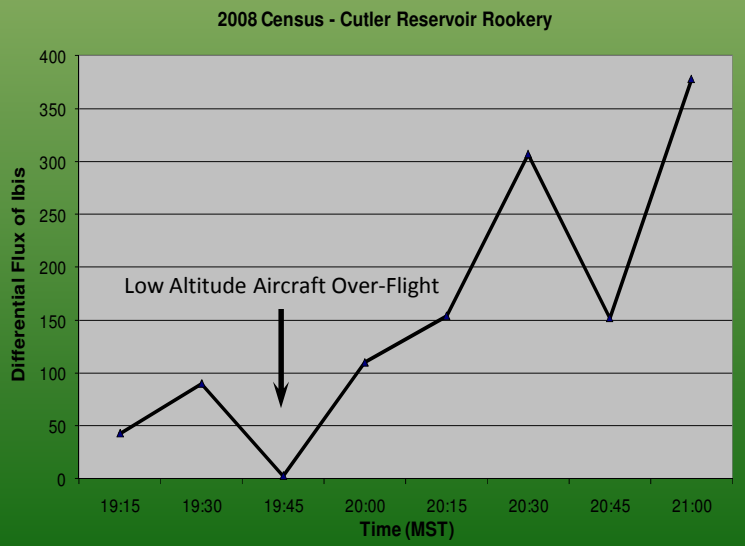
Population Sensitivities

- National Audubon Society:
  "An adaptable and highly gregarious bird of marsh and wetland, the White-faced Ibis can be locally common in one year, yet absent the next. Semi-nomadic, they are often quick to find new habitat created by excessive rainfall or temporary flooding."
- However:
  "The White-faced Ibis is a skittish species. Human interference during the breeding season, even when unintentional, can cause adults to leave eggs or chicks unattended, or even completely abandon a nesting colony. Colonies have also been lost due to competition with grazing cattle."

Source: (http://web1.audubon.org/waterbirds

Threats To Rookery

- Motorized watercraft, especially personal watercraft and mudboats
- Aircraft, especially slow, low-flying ultralights
- Recreational canoeists



Conclusions

- Meets test for IBA of Global Significance
- Threats exist, but rookery has been resilient so far
- Subtle changes include
  - More loafing birds on nearby islands
  - Presence of other waterbirds
    - Franklin's gulls
    - Double-crested cormorants
    - Snowy and cattle egrets
    - Black-crowned night herons
- Local human population and development increasing
- Support from PacifiCorp, Utah Division of Wildlife Resources, and Division of Parks and Recreation for protection

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