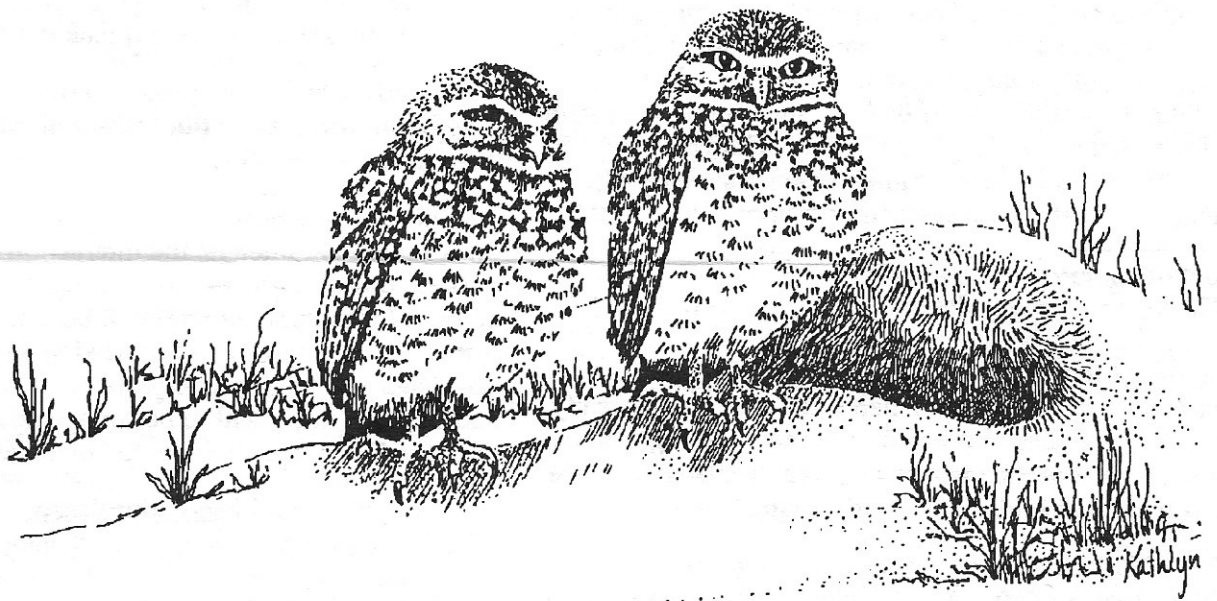


FRIENDS OF GREAT SALT LAKE

Volume 1 no. 3

Spring 1995



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The mission of Friends of Great Salt Lake is to preserve and protect the Great Salt Lake ecosystem and to increase public awareness and appreciation of the lake through education, research, and advocacy.



Dear Friends:


The new year is upon us and exciting times lay ahead. We can look forward to several excellent presentations this year on the Great Salt Lake ecosystem and the human community's role in that ecosystem. Steve Ingram, chair of the activities committee, is organizing several lake outings. Joel Peterson, chair of the research committee, is organizing the establishment of a computerized bibliography of Great Salt Lake research. Joel is also working on a Great Salt Lake land use map.

We are interested in making contact and working with other groups that have an interest in Great Salt Lake. The interest could be the lake as a classroom setting for arts and sciences, or the interest may be in protecting a particular aspect of the lake. These are just ideas. The possibilities are limitless. Great Salt Lake is many things to many people. We want to reach out and expand people's interest, knowledge, and wonderment of Great Salt Lake. If your group would like to explore the opportunities with us, please contact one of the Board members listed in this newsletter.

We are still looking for a logo and invite submissions of sketches or completed drawings.

Friends of Great Salt Lake is a community based organization. We are sincerely grateful for the support by the community so far. We are looking forward to a successful 1995 and beyond.

Sincerely,


Kathryn J. Collins
President

PRESENTING: THE ECOLOGY OF BRINE SHRIMP *JANUARY 24, 1995*

Mr. Dave Ross, an Aquatic Biologist from the Utah Division of Wildlife Resources, will be speaking at our January meeting. Dave will be speaking about the general ecology of brine shrimp and the Division of Wildlife's role in the management of brine shrimp.

In the past Dave has worked for the UDWR as their herpetologist but he has recently started working with brine shrimp. Dave has a

background in herpetology from Wisconsin and has been in Utah for about 4 years.

The meeting will be at 7:00 p.m., January 24th at the Sugarhouse Garden Center - 1650 East 2100 South, Salt Lake City. Members and non-members are invited to the general meeting. Please join Dave and us after the program for refreshments. ∞



A Tiny Sign's Message

Bob Walters

Compared to the huge billboards which line I-15, U.S. 89 and State Street from Ogden to Provo the sign on Goose Egg Island at Farmington Bay Waterfowl Management area is a tiny one. Below the title, *Great Salt Lake Western Hemisphere Shorebird Reserve*, the sign explains

- the Great Salt Lake ecosystem is recognized by the Western Hemisphere Shorebird Reserve Network as "one in a chain of hemispheric reserves for migrating and nesting shorebirds,"

- the lake is described as "an important stopover site for more than 200 species of migratory birds" -- between wintering grounds in South America and nesting areas as far north as the Canadian Arctic -- "providing resting places and food essential to fuel the journey ahead."

- the lake's brine shrimp and brine flies are describe as indispensable food sources which migratory shorebirds utilize without expenditure of much effort (some birds are said to nearly double their weight during a four to six week stop at the lake)

- the lake's open water areas, deltas and wetlands also are noted to produce plants, insects, and other invertebrates and fish for millions of summer resident and migrant birds.

The tiny sign also mentions that

- fully one-half of the wetland habitats in the U.S. have been lost, and that birds and other wildlife dependent upon them have declined

- international cooperation between states and countries along the avian migratory pathways is described as essential -- during the summer, more than one million Wilson's and red-necked phalaropes feed at the lake

- wetlands dotting the Great Salt Lake shoreline are deemed irreplaceable for migrant bird and wetland wildlife

- Utah Department of Natural Resources, U.S. Fish and Wildlife Service, The Nature Conservancy, the Bureau of Land Management, and the National Audubon Society* are listed as supporters with the goal of managing and preserving the site for future generations

Time has passed quickly since the dedication ceremony and unveiling of the sign on Goose Egg Island on August 1, 1992. Gazing out a backyard window recently at the overnight dusting of snow (attributable to "the Lake effect") the sign is miles away and just a spot on a tiny man-made island. Nonetheless, the recalled message prompts the thought that we do well to heed the significance of the Great Salt Lake and acknowledge the fact that the little sign describes a gargantuan element of our environment which will outlive (in one form or another) I-15, U.S. 89, thousands of billboards and untold future generations of our species. Man's attention to and respect for the Great Salt Lake's significance is in its infancy and requires renewed commitment to a better understanding of it. We must accelerate and sustain the effort to inform and educate those who are not members of the environment choir and have not heard or read the message of the little sign. ∞



FIELD NOTES - THE GREAT SALT LAKE IN WINTER

Joel Peterson

My hip waders make me waddle as I traverse the mud flats of the South Shore. Almost tip-toeing, I walk across the slippery goo expecting to sink to my knees at any moment. However, my biggest worries began four days ago on November 12 when my wife showed me a large number of dead grebes along the Antelope Island causeway.

The sun set early that day and a violent wind had built from the northwest. As waves tested the causeway, a thickening froth of foam, too briny to freeze, piled up ankle-deep on the shore like whipping cream. With cold inky waves and shadowed figures on the shore, it was very eerie. Under the foam and amongst the rocks lay dead grebes, over 20 counted within 20 feet of shoreline searched. We hid inside our parkas from the icy wind; my eyes burned from the salt in the air.

The last time I had been to the causeway was a month ago in late October when Elise and I witnessed a beautiful Great Salt Lake sunset. A full moon was rising in the east, and grebes floated on the lake everywhere - as far as our scope could see. Now, with this tragic sight, I felt that I somehow neglected the lake and its birds. The work that seemed so important and kept me from the lake now seemed trivial. Who is watching and documenting these changes?

Today, as I traverse the South Shore mud flat, I look for some indication that the same could be happening here, and to make up for lost time with this lake. My derelict canoe waits on top of my truck. Too shallow here and too windy today. On top of that, it begins to snow! The storm is likely influenced by the "lake effect." The temperature of the lake averages 4 degrees F warmer than the mean daily temperature of the surrounding air. This contrast causes thermal instability of the air mass above the lake, influencing precipitation. Fog is also a result of this temperature contrast. Other influences the

lake makes on local precipitation include a natural "seeding" of the air by salt crystals, and additional moisture from evaporation of this tremendous body of water.

The surface level of the Great Salt Lake fluctuates continually in response to climatic changes. Because of salinity differences, the North Arm lake level is often higher than the South. This surface level difference varies seasonally, with the minimum generally occurring during the Fall and the maximum in late Spring. Winter precipitation begins the disparity of two sides.

The Great Salt Lake slowly loses its warmth during the winter. If you were to read a thermometer at varying depths in the lake, you would get warmer temperature readings several feet deep than at the surface. An exception will occur where the icy fingers of river water course underneath.

In the winter, the sailboats on the lake are replaced with an armada of brine shrimp boats. Cysts, the encapsulated eggs of the brine shrimp, float on the water's surface. They are collected in winter months by boats that skim the surface on the calmest days. You can find smaller amounts of brine shrimp cysts floating in a light brown or pink ribbon right along the shoreline. Incidentally, you can collect up to 10 lbs. of shrimp and eggs per week for your own use in fish aquaria, or just to hatch and observe. Brine shrimp produce the cysts instead of live young as a response to environmental cues. Recent research findings suggest this response is primarily from the seasonal fluctuation of plankton on which they feed. Further, brine shrimp mortality in the winter appears to be caused by lack of food rather than low water temperatures.

(see Winter on page 5)

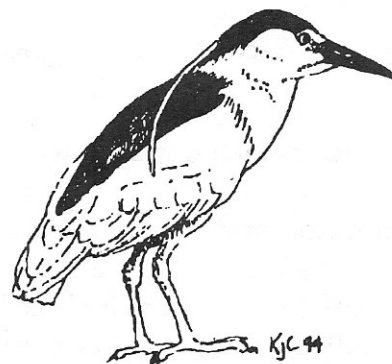
(Winter from page 4)

The Wilson's phalaropes, which gathered by the hundreds of thousands, in August were well fed before they departed for their non-stop flight to South America. Also gone are the eared grebes which began congregating on the lake in late summer for rest, much eating, and a safe place to experience a flightless period during their molt. However, throughout the Winter there are many unusual migrant birds that make stops at the lake. Also, there are large congregations of ducks at this time of year including northern pintails, teals, and northern shovelers. You can hear about them on the Birdline at 801-538-4730.

As I ponder the winter on the Great Salt Lake, the wind has picked up a bit. My walk out onto the mud flat stops at the end of the sandbar that fingered into the lake the farthest. I counted a dozen dead birds along the way. Is it normal

mortality from storms or is this a significant event? Do we know what is normal?

Oddly, my footprints are disappearing from the sandbar more quickly and I'm beginning to sink to my ankles in what I easily walked over 5 minutes ago. I notice the waves also picking up, melting the sandbars which took me out this far. I pick up my pace as I make a beeline for the shore, back to my truck carrying the snow-covered canoe that now waits for spring.∞



DR. Z. MATTHEW GLIWICZ GIVES LECTURE AT UTAH STATE UNIVERSITY

Elise and Joel Peterson

Dr. Z. Matthew Gliwicz presented preliminary findings from his study on brine shrimp (*Artemia salina*), [pronounced "ar-TEE-me-uh"] and the Great Salt Lake ecosystem in his talk titled *Diversity of a Simple Ecosystem: The Great Salt Lake*. Dr. Gliwicz is a visiting professor from Warsaw, Poland invited to Utah State University by Dr. Wayne Wurtsbaugh.

Dr. Gliwicz has discovered a wider range of zooplankton and phytoplankton species than previously known in the lake including types algae, diatoms, ciliates, and flagellates. He also has described new feeding strategies of adult *Artemia*.

The ecology of the main body of Great Salt Lake can be described in terms of two trophic levels: the "grazers" (*Artemia*) and the "plants" (plankton). This simple system arises from a lack of predators on *Artemia*. With low predation there is intraspecific competition, i.e.

competition between *Artemia* for the food resource.

In contrast, the eutrophication and freshening of Farmington Bay water creates a system which allows aquatic insects that prey on *Artemia* to survive. This causes interspecific competition, i.e. predator insects limiting the population of *Artemia*.

Dr. Gliwicz is comparing survival, size, and recruitment of *Artemia* throughout the lake. There is low recruitment of nauplii (live young born to adult *artemia*) both in the main body of the lake and Farmington Bay but for different reasons. Nauplii survival in Farmington Bay is low because of predation by aquatic insects. Nauplii survival in the larger body of the lake is low because they cannot compete with the adult *Artemia* in low food conditions. Naupli are obligate filter feeders in their first instars.

(see Gliwicz on page 6)



DEADLY DISEASE STRIKES GREAT SALT LAKE

Elise Peterson

On November 11, 1994 two Fish and Wildlife Service biologists noted several dead birds along the Antelope Island causeway. Concerned, they returned Monday for a closer look. What they found was thousands of dead eared grebes and a few dead gulls and northern shovelers. In an effort to identify the problem, five of the grebes were sent to the National Wildlife Health Center in Madison, Wisconsin for diagnosis. The results came back positive for avian cholera.

Avian cholera is a highly infectious disease caused by the bacterium *Pasteurella multocida*. It is a common and naturally occurring disease in some areas but this is the first time it has been reported at Great Salt Lake. It strikes very quickly, killing birds in 6-12 hours. Due to the fast nature of this disease it is very uncommon to see sick birds or any warning signs of a problem.

The disease is spread by bird to bird contact and ingestion of contaminated food or water. Therefore waterfowl's gregarious nature makes them very susceptible to an outbreak. The longevity of the bacterium also contributes to its potential harm, living in the soil for up to four months. The best way to control this bacterium is through early clean up and disposal of carcasses which must be handled very carefully

and then incinerated.

Since the eared grebes were first reported, thousands more birds have been dying along the south shore including gulls, northern shovelers and teals. How many more will die is unknown. Early cleanup was not attempted and the benefits of cleanup at this stage of the outbreak are questionable. Due to the infectious nature of the bacterium the people carrying out the cleanup run the risk of transporting the disease to other areas on their boots, vehicles and boats. Also the presence of the cleanup crews could displace infected birds to other lakes and ponds, thereby infecting other water bodies and spreading the bacterium.

The birds of Great Salt Lake have had a tough time this year with a large outbreak of avian botulism occurring late this summer followed by this outbreak of avian cholera killing thousands of birds. There are many natural diseases that can kill large numbers of birds but usually the earlier the problem is detected the better the chances are of controlling an outbreak so if you see sick or dead birds, don't hesitate to call the Fish and Wildlife Service Contaminants Section at 524-5001 or Division Of Wildlife Resources at 538-4700. ∞

(Gliwicz from page 5)

assimilate enough food through filtering alone to equal or better their food needs. So, they either die or simply do not grow.

The adult *Artemia* can employ additional strategies for obtaining food such as browsing on sediments, sweeping surface film, and exploiting "Artemia gardens", to glean limited food resources. The *Artemia* gardens consist of *Artemia* exoskeletons suspended in the water column and colonized by a high diversity of

plankton species. In low food conditions adult *Artemia* are filling their stomachs with these exoskeleton particles.

As the year continues and the adults in the main body of the lake have depleted the *Artemia* gardens and begin to starve, they produce cysts instead of nauplii. *Artemia* in Farmington Bay, in the presence of abundant food, continue to produce nauplii instead of cysts. Cyst production vs. nauplii production seems to be associated with food availability rather than water temperature or salinity. ∞

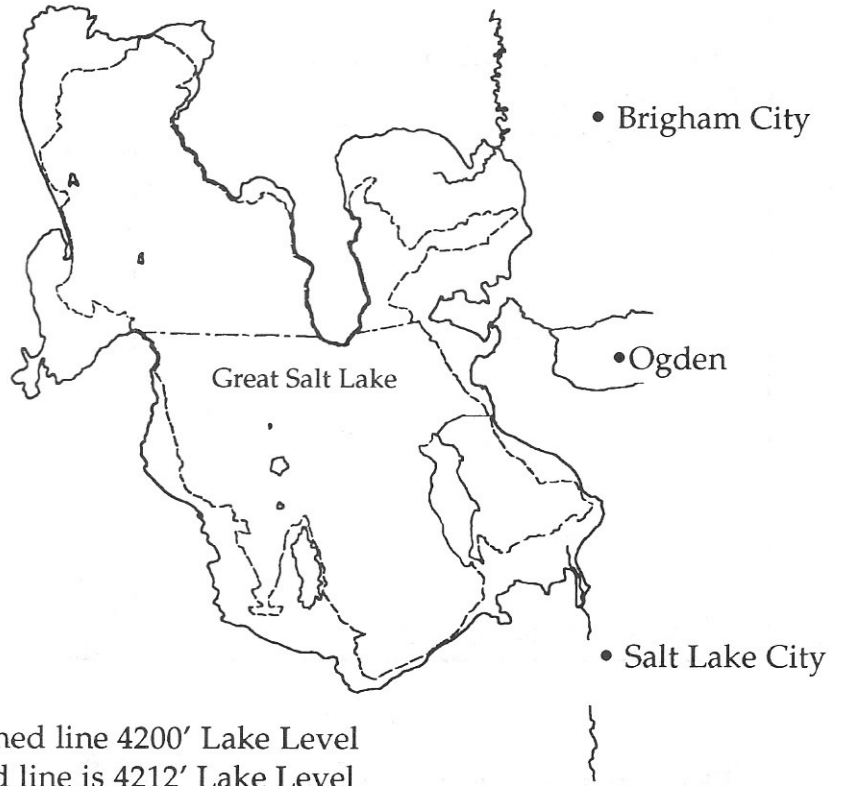
Wish List

Santa heard our request and sent us Jennifer Speers who is donating a slide projector, and Sanders Brine Shrimp Company who is donating a copier.

Thank you!

Our 1995 wish list includes:

- 386 computer with printer
- reduced cost or free printing and slide processing service
- sponsor for a newsletter
- sponsor for a specific event



FRIENDS OF GREAT SALT LAKE BOARD OF DIRECTORS AND COMMITTEE CHAIRS

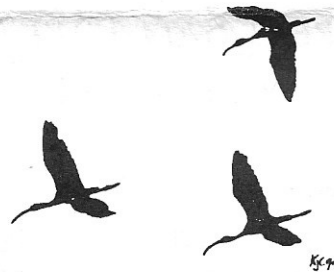
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