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Great Salt Lake
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UT 84110-2655
www.fogsl.org

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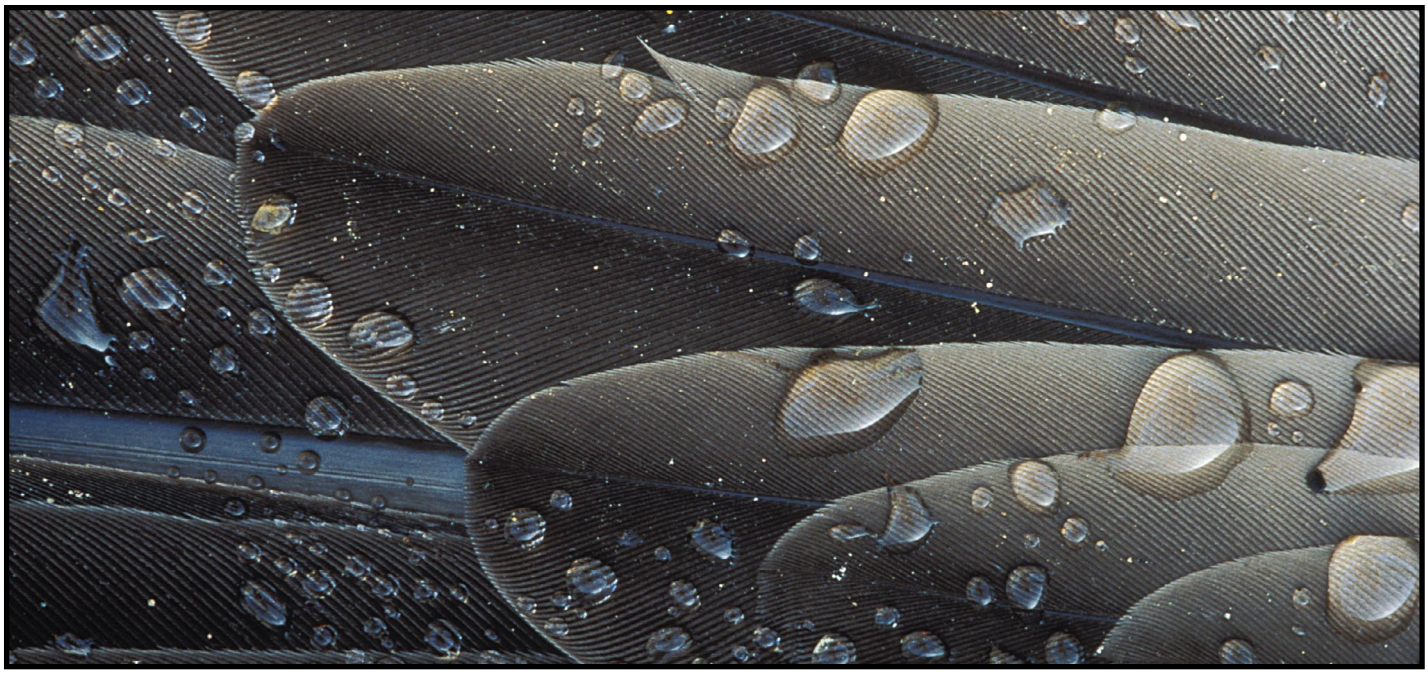


Goosefeather, May 1993 by Gary Crandall

FRIENDS of Great Salt Lake

P.O. Box 2655, Salt Lake City, Utah 84110-2655 801-583-5593
mail@fogsl.org

Volume 9 Number 4 Summer 2003

The Great Salt Lake (Self-Portrait), 1964: John Button (1929-1982), American

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.

President's Message

Molting

At the Lake - FoGSL Board of Directors 1999 photo by J. Zinanti

"For birds, molting is the process of dropping old feathers and growing new ones in their place, and most birds molt at least once a year."

David Allen Sibley

Ten years ago, the founding mothers and fathers of FRIENDS attended a conference put on by the Mono Lake Committee. Both Mono Lake and Great Salt Lake are terminal, saline lakes. They share the same shorebirds. They both have brine shrimp and brine flies. And they each face tremendous challenges to their sustainability.

The Mono Lake Committee had just won a long legal battle to prevent Mono Lake from being drained dry by the needs of a growing population. Anything sound familiar here? It was no great surprise when Wayne Martinson, and Joel and Elise Peterson were asked by members of the Committee, "Why don't you do for Great Salt Lake what we did for Mono Lake?

The question inspired Martinson's "Call to Binoculars", inviting audience members at a lecture series called The Sage Brush Ocean: A Naturalist's Vision of Great Salt Lake, to form an organization that would work to preserve and protect the Great Salt Lake Ecosystem.

That's how FRIENDS of Great Salt Lake was born.

In October of 2004, we'll be ten. Since our incorporation, with an all volunteer board, we have devoted a tremendous amount of time and energy toward elevating the needs of our big, salty neighbor through our education, research and advocacy efforts. Our Biennial Great Salt Lake Issues Forum, The Lake Affect and development of Project SLICE, our Field Seminars and monthly programs, and the formation of the Doyle Stephens Scholarship Fund, are just a few examples of goals that we have achieved that increase public awareness and understanding of the lake.

But even with our many accomplishments, we must be even more tenacious if we're going to try to keep

up with the continuing challenges Great Salt Lake faces as growth projections become a reality. So, it's time for a molt. It's time to deliberate on the future and how we can be more proficient with our lake work.

To give us more direction and a sense of stability, we're embarking on a strategic planning process that requires your input as members and supporters. Tell us what FRIENDS of Great Salt Lake should be in ten years. What factors do you think will limit our success in reaching our goals? And what do you see as major challenges facing the organization? If we're going to mature into an organization that is even stronger, the foundation of that strength has to come from the membership.

According to our existing bylaws, my term as FRIENDS President must end in 2003. I will have served a total of 6 consecutive years which is the present term limit for officers and board. However, because I want to see us through this growth spurt, I am very willing to continue as president for two more years. That would require an amendment to the bylaws and a 2/3 vote of members present at the October 28th membership meeting. The amendment provision would ensure a continuum of institutional memory as FRIENDS evolves. The provision, as approved by the board, reads: "In special cases, upon the recommendation of the board, terms may be extended beyond the six year limitation."

That amendment is a very small part of the changes we will be considering as we go through our molt. Like molting, the changes will not be all at once. They will emerge from contemplation and discussions with Great Salt Lake stakeholders, supporters of our efforts, and of course, our members.

What do you think? Help us with this organizational soul search. Let us know.

How should our feathers grow?

In saline,

Lynn de Freitas

What You Can Do

Send your letters and email to us with your thoughts about how FRIENDS can be stronger and more effective in our Lake work.

FRIENDS of Great Salt Lake
PO Box 2655
Salt Lake City, Utah 84110-2655
email to:
mail@fogsl.org

For more details, check our website at www.fogsl.org.

FRIENDS ORGANIZATIONAL STATEMENT

The mission of FRIENDS of Great Salt 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.

FRIENDS has a very active Board of Directors and an Advisory Board consisting of professionals in the scientific, political, literary, education, and broadcast communities. Founded in 1994, we have organized and sponsored an array of programs, activities and materials in pursuit of our mission.

Since 1996, we have sponsored a biennial Great Salt Lake Issues Forum that provides a gathering for policy makers, researchers, planners, industry reps and citizens who are involved in and concerned about the Great Salt Lake.

The goal of each Forum is to encourage constructive dialogue about the future of the lake's ecosystem and its resources, and to illuminate the complexities involved in research, management and planning for the lake.

In 1997, we hired Bruce Thompson as our education director and initiated a major regional education project designed to enhance both the knowledge about and care for the future of Great Salt Lake. Bruce wrote and produced a live-narrative slideshow program "The Lake Affect: Living Together Along the Shores of Something Great.". Over 11,000 people in the 5 counties surrounding Great Salt Lake have seen the program.

We are presently working on video & DVD versions of The Lake Affect. With this and the Project SLICE, a Great Salt Lake curriculum correlated to the fourth grade science core curriculum, we hope to achieve a positive, long-lasting impact on the future of Great Salt Lake and those who dwell upon its shores.

In 2003, we awarded our first Doyle W. Stephens research scholarship. Until his death in May 2000, Stephens served as a research hydrologist for the U.S. Geological Survey. He is particularly remembered for his work toward increasing public awareness of the Great Salt Lake Ecosystem.

FRIENDS was awarded the Conservation Achievement Award by the Utah Chapter of the Wildlife Society in 1998.

Summer 2003 Calendar of Events

Check the local papers and www.fogsl.org for announcements of speakers and topics at our General Programs, or call our hot-line at 801-583-5593, and press 1 for monthly activities.

NOTE: General Programs are held at the Sugarhouse Garden Center, located in the northeast corner of Sugarhouse Park, 2100 South 1650 East in Salt Lake City.

On the Cover

***The Great Salt Lake (Self Portrait), 1964*: John Button, Oil on canvas.**
Collection, Utah Museum of Fine Arts, University of Utah, Gift of Mr. Sidney Talisman. Museum #1989.032.001

John Button, who died in 1982 at the age of 53, was a native of San Francisco. He attended the University of California, Berkeley and the California School of Fine Arts, San Francisco. Early in his career, he studied with Howard Warshaw and Altina Barrett in Southern California. He then spent the bulk of his life working in the East, teaching at a number of schools, including New York's School of Visual Arts, The Cornell College of Art, Architecture and Planning, The Maryland Institute of Art and Swarthmore College. His last appointment was with the Graduate School of Fine Arts, University of Pennsylvania.

A painter of passionate clarity, fellow artists admired his work deeply, as did critics such as Hilton Kramer, who called it "a chronicle of visual pleasures." Courtesy of UMFA.

The Great Salt Lake Alliance

By Maunsel B. Pearce, Chairman GSL Alliance

Lynn has asked me to introduce the Great Salt Lake Alliance to readers of the Newsletter. This is no easy task, because the Alliance has been a quiet, informal group. We have been meeting monthly when necessary since January, 1998 to exchange ideas and share information and concerns about the Great Salt Lake Ecosystem. It all began at an Alta Club luncheon hosted by Utah Wetlands Foundation founder Bill Olwell, Bob Valentine, and myself.

The Alliance is composed of the leaders of local conservation groups with a major Great Salt Lake focus. Organizations represented include: Friends of Great Salt Lake, The Nature Conservancy of Utah, Great Salt Lake Audubon, National Audubon, Ducks Unlimited, Hawkwatch International, Utah Wetlands Foundation plus a few important "Lake Advocates": Bob Adler, Cullen Battle and Ella Sorenson. We have resisted temptations to expand because we seem to function best as a small focused group.

Our goal or mission is to promote cooperation rather than competition among groups and to share in healthy dialog on issues affecting sustainability of the Great Salt Lake Ecosystem.

A few highlights of activities over the past five years:

Detailed comments submitted on the Great Salt Lake Management Alternatives proposed by Utah Department of Natural Resources for the Great Salt Lake Planning Project.

Coordination of efforts opposing Alternative C of Legacy Highway including breakfast with Governor Leavitt.

Informative discussions with Directors of Department of Natural Resources and Division of Wildlife Resources, Representative Jim Hansen's staff and others in promoting the Sovereign Lands-Bear River Refuge settlement.

A friendly discussion among all parties about Farmington Bay water quality concerns. This resulted in the creation by Utah Division of Water Quality of the Farmington Bay Water Quality Working Group. Meetings and grant applications are ongoing.

The Great Salt Lake Alliance is now represented on the Division of Forestry, Fire and State Land's Great Salt Lake Technical Team and The Technical Advisory Group of the Great Salt Lake Ecosystem Project.

Perhaps our best contribution to the Great Salt Lake conservation community will be the promotion of cooperation and enhancement of partnerships among various stakeholders within a framework of watershed conservation. That is a lofty goal, but worthy of our effort.

photo by Gary Crandall

Assessing the Water Quality of GSL and its Wetlands

By Theron Miller, Utah Division of Water Quality

Utah's Division of Water Quality is responsible for determining beneficial uses and developing water quality standards to ensure support for these beneficial uses for all waters of the State of Utah. The Clean Water Act requires that these waterbodies be periodically assessed for beneficial use support and we currently perform this assessment every two years. Our assessment program currently includes more that 500 stream segments and 131 lakes and reservoirs (97% of the State's fresh water) The Division currently spends about $1,500,000 each year collecting and analyzing water quality samples in support of this assessment process. Although costly and time consuming, assessment of the state's fresh waters is relatively straight forward. This effort has been greatly facilitated by the US EPA's Office of Research and Development, which has spent many years and many more millions of dollars conducting toxicological research and subsequently published and periodically updated Water Quality Criteria for Aquatic Life. In most cases, the Division simply has to insert local values for hardness, temperature or pH into sophisticated equations and derive environmentally sound and defensible water quality standards for our cold and warm water fisheries.

However, this is far from the case for saline waterbodies and particularly hypersaline inland lakes, such as Great Salt Lake. There are no EPA recommended water quality criteria for toxics or nutrients for any organisms that live in a saline environment like the Great Salt Lake. There are notably few species that inhabit such saline systems. In the south arm, when salinity is at about 120 g/L, there are perhaps 20 species of algae and 10 species of protozoans comprising the planktonic (microscopic) community and only four species of macroinvertebrates, including brine shrimp.

But the lake is far from homogeneous. Two causeways, Southern Pacific Railroad and the Davis County causeways, effectively divide the lake into four distinct, but extremely dynamic regions. These include: Bear River Bay, Gunnison Bay (the north arm), Gilbert Bay (the south arm), and Farmington Bay. Each of these regions has its own hydrologic and salinity regime, ranging from extreme hypersalinity in the north arm to nearly fresh water in Bear River Bay. Farmington Bay averages about 30% less salinity than the south arm. Consequently, typical wetland macrophytes can not tolerate this level of salinity and thus, are confined to impounded wetlands associated with wildlife management areas and hunting clubs or other areas immediately adjacent to fresh-water tributaries or wastewater discharges. However, this slightly lower salinity does allow additional opportunistic species of algae and zooplankton and occasional dramatic proliferation of aquatic corixid (water boatman) beetles in the pelagic (open water) zone. These beetles are known to prey heavily on brine shrimp and brine flies. The Farmington Bay ecosystem is further complicated by the receipt of the great majority of municipal waste-water generated by the wasatch front metropolitan area. These added nutrients increase the primary productivity of both the pelagic environment and its associated wetlands. Brine shrimp are apparently not as abundant as in Gilbert Bay and hypotheses for these lower numbers include; the effect of lower salinity on production and viability, large numbers of predacious corixid beetles that can tolerate this lower salinity, change in algal species to those that are less palatable to brine shrimp, or finally, periodic low dissolved oxygen concentrations resulting from excessive algal blooms. On the other hand, brine flies, another important avian food resource, may be nearly as abundant as in other regions of the lake.

Because of these unique characteristics, and especially among the tremendous range in salinity among its various regions, the Division has given Great Salt Lake unique classification (Class V), for the support of aquatic life, secondary contact recreation and mineral extraction. Secondly, the Division has identified the wetlands surrounding Great Salt Lake as 3 C (protected for non game fish and other aquatic life including necessary aquatic organisms in their food chain) and 3 D (protected for waterfowl, shorebirds and other water-oriented wildlife and necessary aquatic organisms in their food chain). Exceptions to this designation are the Bear River Migratory Bird Refuge and Locomotive Springs Waterfowl Management Area, which are classified as 3 B (warm water game fish and other warm water aquatic life including other necessary aquatic organisms in their food chain) as well as 3 D. As such, we do not apply numeric standards to the pelagic (open water) portions of Great Salt Lake. There are simply no scientific data identifying life history needs of brine shrimp, brine flies or other algal or protozoan species that occupy their food chain (Appropriate water quality guidelines traditionally provided by the EPA, including ocean and estuarine environments, simply do not apply to the unique species and ecosystems of Great Salt Lake; This type of data generally costs tens to hundreds of thousands of dollars to generate for just a few species.).

Therefore, the Division has relied on qualitative data and interpretation provided primarily by the Division of Wildlife Resources' Great Salt Lake Ecosystem Project (for aquatic life concerns; e.g. see Friends of Great Salt Lake Newsletter, Spring 2003) and Wildlife Management Area managers (for waterfowl and shorebird concerns), to help us determine the condition of Great Salt Lake and its wetlands. In addition, all major tributaries and point source discharges into tributaries or directly into Great Salt Lake have been meeting strict effluent permit requirements in order to comply with all water quality standards.

However, citizen groups, including Friends of Great Salt, have recently raised more pointed questions about Farmington Bay and whether beneficial uses are actually being maintained. Most

comments identify nutrient enrichment, odors (lake stink) and, to a lesser extent, some toxic metals or compounds. In recognizing these concerns, the Division of Water Quality has embarked upon a study to gather data and characterize the unique environment of Farmington Bay and its associated wetlands. In order to direct this effort and recognize the various concerns, we have organized the Farmington Bay Work Group. This group has representatives from conservation groups, including: The Nature Conservancy, Great Salt Lake Audubon, Friends of Great Salt Lake, and Great Salt Lake Alliance; agency personnel from USGS, Fish and Wildlife Service and Divisions of Wildlife Resources and Water Quality, Davis County and Central Davis Sewer District; and academia. We have two technical advisory subcommittees, one for the pelagic and one for the wetland study. These subcommittees identify specific objectives, assign tasks and will review data and direct future studies.

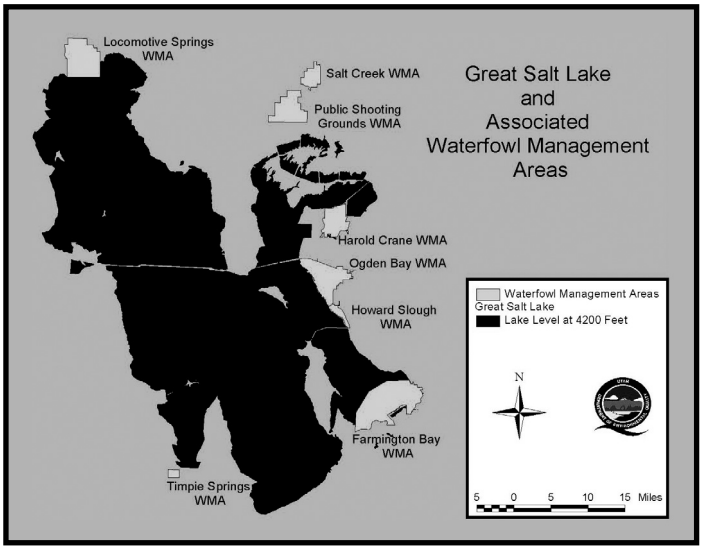
We have had to utilize some creative financing in order to even begin this project. The Division's monitoring crews and Davis County Public Health specialists will shoulder much of the added fieldwork and the Division's arrangement with the State Health Lab will provide for much of the sample analysis. We have obtained a $70,000 EPA grant to study Great Salt Lake wetlands, the USGS is contributing approximately $40,000 in capital, labor and analytical costs and we specifically acknowledge Central Davis Sewer District whose unique arrangement with the State Revolving Loan Program has freed up $200,000 to contribute to this study.

Our overall objective is to develop quantitative assessment methods. These methods will then be used to perform a Beneficial Use Assessment that accurately reflects the environmental needs of important aquatic species. In detail, this objective must address two essential questions:

1. What are the essential or valuable species that can flourish in Farmington Bay and provide a food resource for avian species? This alone, is a formidable task. For example, the overall driving force for dictating the components of this aquatic ecosystem is salinity itself. Farmington Bay regularly crosses the threshold of salinity (back and forth), for not only optimal brine shrimp production, but also many of its preferred algal species for foraging. Throw in the added predatory pressure from corixid beetles that occurs at lower salinities and we already have a multidimensional matrix of variables. And remember, somewhere we have to add the variable that was questioned in the first place * what is the influence of enhanced nutrients? Does nutrient loading favor some algal species over others, and are these algal species palatable or unpalatable to brine shrimp? This provides a brief example of the immense complexity and multitude of variables that must be addressed just to scientifically characterize Farmington Bay. We have to address these variables one at a time and then in concert with each other. Finally, we must determine their importance to the aquatic and avian components of the ecosystem.

2. We can then use results of Step 1 to develop appropriate end points or metrics of community health to help us quantify environmental thresholds (standards) for various water quality parameters. These values can then be used for assessment purposes. This step will also be difficult to achieve and could conceivably result in a very complex or "floating" standard (such as the effect of pH on our current ammonia standard). Here's a very hypothetical example: At low salinities, and nitrogen-limited conditions, nuisance blooms of unpalatable blue green algae dominate and the brine shrimp population suffers. In this case, we may want to limit nitrogen loading to the Bay to control the blue green algal population. But higher salinities preclude nuisance algal species and favor growth of more palatable species. Hence, added nutrients enhance desirable algal species growth, the brine shrimp population flourishes and birds are provided a bumper crop of food items throughout Farmington Bay.

The final answer to these many questions are years away. Data collection and analysis for the first three years (with adequate funding) will focus on basic limnological and wetland characteristics and functions. We will perform salinity and nutrient limitation bioassays and conduct considerable chemical and biological sampling throughout the bay and several wetlands. Our initial goal is to characterize these ecosystems across the salinity and ,nutrient gradients experienced by these systems. We anticipate that by years three–four, we will be able to identify meaningful end points and environmental thresholds for important species. Perhaps another three to four years will be required to validate and "fine tune" these assessment tools over the range of expected salinities and actually make essential correlations between possible standards and desirable conditions within the Bay and its wetlands. This study will require continued careful design and immense patience. We may not have to re-invent the wheel, but we're going to have to re-design it.



courtesy USGS

ASK ARTEMIA - WE WELCOME YOUR QUESTIONS VIA EMAIL OR PHONE

Ar-te'-mi-a, noun; a genus of brine shrimp belonging to the subclass Branchiopoda

Dear Bruce,

I had an interesting e-mail from a parent who has been working on the Legacy Highway Project for the past two years. She was quite upset with "my view" regarding the protection of GSL wetlands and thought I was very biased. She believes that the Legacy Preserve should be enough space.

Have you got any hard data for me? Perhaps I have been giving my students a one-sided view…

Thank you,

R.G. - a Salt Lake City Teacher

Dear R.G.,

From discussions with educators about where the Legacy Highway construction fits in with Great Salt Lake education, I am reminded of the "balanced view" argument that always enters into curriculum efforts that resonate with current events and issues. My own work in this regard is guided by the view that we are currently suffering an imbalance between what we as citizens know about wetlands systems (or most any natural system for that matter), as opposed to what we know about urban life, commuting traffic and highways. Thus, whenever any "weight" is added to the side of the scale where ignorance prevails it likely to be perceived by some as "biased."

Our teachers can find some sanctuary in sticking to the facts, yet those traveling down the presumed safety of the factual expressway frequently encounter detours or reach the end of the pavement before the ride is over. Perhaps a course nearly as safe and ultimately more practical is that teachers endeavor to approach such topics with objectivity.

What does factual knowledge give us with respect to wetlands and highways? What we KNOW is that wetlands are second only to rainforests in their biological value as terrestrial systems. (I think Unit 5 of Project SLICE explains this quite well.) We also KNOW that 51 percent of all wetlands in the contiguous US have been destroyed during the past two hundred years, and are STILL being destroyed at an alarming rate. We further KNOW that our own arid state has a paltry 1-1/2 percent of its land as wetlands, most of them at the eastern shore of Great Salt Lake. We also KNOW that the MILLIONS of birds that rely on the wetlands on the edge of our lake represent globally significant populations. And, we KNOW that the general public -- including our young people -- are ignorant as to the existence, let alone functional value, of most natural systems that surround and support them. And finally, we KNOW that Great Salt Lake can and will continue to fluctuate -- as it did in 1985 and 1986 -- to elevations close to and including the proposed Legacy Highway corridor.

Unfortunately, our other forms of "Knowing" remain elusive. We do not know, for example, when the lake will rise again and to what elevation. We do not know where the huge populations of birds would go if the lake squeezed up against a new highway corridor and left them no place to rest, feed and reproduce. We do not know exactly how many acres in addition to the 100-plus acres of highway footprint will be rendered useless or degraded because of traffic noise, vandalism and pollution runoff. We do not know, for that matter, how many years it will take to fill another highway and bring us to another dilemma such as that we are now facing. And we will never be capable of measuring just what, in dollars, any natural system is worth.

So, my advice to teachers? If your discussions remain focused upon wetlands and their services, and you are helping your students to see that ANY form of wetlands loss here is in neither the best interest of wildlife or wetlands services, your bias is aptly aimed in the direction of correcting an existing imbalance. A bias one would hope we all maintain as educators.

Warm Regards,

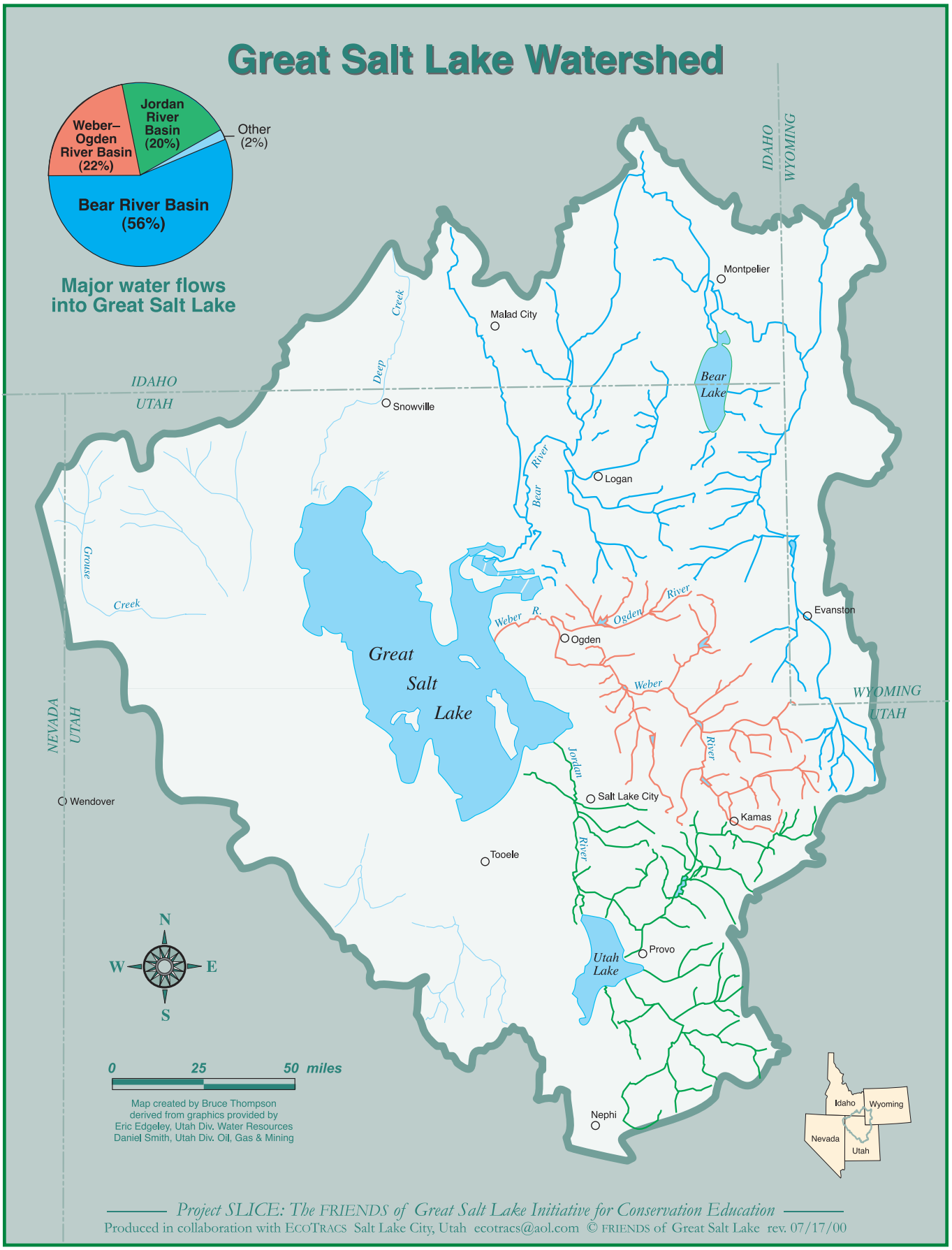
Bruce Thompson
Education Director

Lake Fact:

How many brine shrimp does an eared grebe have to eat each day in order to survive?

See page 15 for answer.

A Slice of SLICE



An Aerial View of Great Salt Lake

by Larry Swanson, LightHawk volunteer pilot

I started flying 40 years ago and one of my first expeditions was to circumnavigate the lake and absorb its stark beauty. A nice day trip, in my mind, would be a dawn start following the shoreline west of the airport and watching all the shore birds in the wetlands that ring the shore.

I remember the enthusiasm the Audubon Society folks had when I helped them create a strip chart of aerial photographs along this stretch. I hope it helped in their preservation.

Soon a touch of the left rudder and I can look down on the old buildings of the historic farm on Antelope Island. Its preservation and conversion to a visitor's center is a nice service to lovers of the GSL. If I'm lucky and it's early in the morning I might catch a look at the bison that are so elusive to spot some days.On rare occasions someone might be poking into the beaches and bays in a sea kayak or canoe on the remote west side.

As my Cessna drifts along north, I will soon be in rough formation with lots of "V's" of ducks going whichever way in their pursuit of breakfast. In the fall, the swans and geese will be flying back and forth to the corn fields of the local farmers. They look magnificent from the air as well as from the ground. If the water is low the whimsical spiral jetty may be visible. More bird refuges surround the mouth of our endangered Bear River. I hope you and Zach Frankel can keep the dams out and the water flowing.

Fremont Island must have an interesting history with all the evidences of early inhabitance.

From the airplane it's easy to pick up the trail of the first transcontinental railroad as it approaches Promontory Point. One can see exactly where dirt was hauled, where a route was started and then moved, and where the route from the east overlapped the route from the west in the contest to see who had laid the most rail.

The new long railroad causeway crosses the lake like an arrow from the tip of Promontory Point with the blue green water to the south and the almost purple color of the water to the north of the causeway. The rebuilding necessitated by the high water years is interesting to view from the air. The shoreline to the North and West of Promontory Point is full of history. There are evidences of early homesteading and of course the sites of the early towns that sprung up alongside the original rail bed.

Great Big Brother Salt Lake

You were here thousands of years before I was,
and I look up to you for guidance, you I can trust.
Tell me great lake will I be able to survive like you?
To keep supporting life and push on through the boundless time?
like those left behind when the sun beat down on you,
the scars left when you fought back and held your poise.
Tell me again oh familiar lake may I have your strength to ignore the pain?
to keep the soft salts all held deep within my heart.
And though these salts may build up uncontrollable poisons,
I will try my best to keep them as you have.
To never ever forget what you and I have been through.
And tell me brother when I leave and my short time passes,
will you hold my love and memory and carve me a scar in your home?

by Ammon Jon Statterfield - Brighton High School

Rows of now dead trees evoke visions of tree lined main streets and small fenced squares with barely visible white boards or stones are the cemeteries. The land seems devoid of any possibility of vegetation until the lush Locomotive Springs appear which are filled with birds and channels of fresh water.

As we continue on around the lake shore I follow the new rail line west until the old rail bed and the new converge on Lucin. The spring fed pond often has ducks near the ruins of the historic town of Lucin and just south of here, right out on the mud flats are the curious "Sun Tunnels". The 7ft dia. concrete tubes are aligned so that at both the summer and the winter solstices the rise and set of the sun is perfectly aligned through two of them and during the day the drilled holes create spots on the interior floor that are constellations. The first time I saw them I was searching for new climbing routes in the islands and was so intrigued that I landed the old Piper I was flying on a jeep road and walked over to them.

Back on the lake I am careful not to intrude on the frenetic bird activity on Carrington Island. The birds ebb and flow in flocks almost obscuring the sand at times on these islands. A feature only seen by airplane are the minute evidences of early prospecting and ranching on the mountains that jut up from the surface of the lake or from the mud flats. It must have been terribly spartan living. The topographical maps sport features like "Dead Cow Point" and "Poverty Point" to illustrate.

Another feature seen from the air if the light is just right are the tracks of the Donner party. You can see the discoloration of the sand left by the deep ruts of the wagon wheels.

The bitter side of the GSL will have been apparent, in the air, for miles as I fly down the western shore and encounter the putrid effluent of the MagCorp facility. As you know it is the worst polluter in the US. I have tracked the airborne pollution all the way to Brigham City which is probably a hundred air miles. I have flown with Chip Ward and his organization in photographing the leaking settlement ponds and the pollution from the air. I think it was helpful in forcing the company to institute big changes but they have a long way to go.

Leaving MagCorp the scenery brightens as the sailboats, looking for all the world like white butterflies on a blue green meadow start spreading out from the marina on the south shore. Soot and grime, less than that of years ago, surround the Kennecott smelter stack as I turn south and I am soon back home again anxious to go again at the slightest whim.

Sunset on the GSL is wonderful from many places in the Salt Lake valley but is indescribable from the air.

The Oquirrh mountains from the cockpit - photo by Denise Brown

Great Salt Lake Field Seminar Series

A Day on the Lake with DWR Scientists, By Sharen Hauri

A tour of Great Salt Lake led by scientists who truly understand the lake is a rare treat. So when FOGSL announced the May field seminar, I quickly rounded up a couple of friends to join me.

The trip was postponed from its originally scheduled date—on a day when the weather seemed benign. Two weeks later, when we actually made it out on the water, we learned why our guides were so cautious. Clay Perschon and Ted Nolton, scientists with the Great Salt Lake Ecosystem Project met us at the marina on Antelope Island and expressed they were hopeful that we would be able to make a full tour because the winds seemed to be dying down.

Threatening weather can be much more hazardous on the lake than one might expect. Clay explained that this waterbody acts more like an ocean than a lake in many ways. The high salinity makes the water very dense, much more dense than ocean water. When winds create choppy water, the waves hit the boat and shores much harder than oceanic water and can seriously threaten lives or make passengers very sick – making for a very unpleasant cruise.

The two boats we used, research vessels for the Great Salt Lake Ecosystem Project, are actually ocean-going vessels that look like the boat in the movie "The Perfect Storm." We quickly got the picture. Both boats are equipped with very sophisticated GPS and radar screens that show the depth of the water, hazards at and below the water surface, and even our exact position on the lake. These are no luxury items – they are essentials to negotiate the lake in good and bad weather, day or night because the lake is so shallow along its shores and water levels can shift dramatically with wind and wave action and also because reflections on flat water and hazy days can be completely disorienting. Boats easily become mired in places that appear deeper than they are. With caution, large portions of the lake can be explored and that was our mission.

We started off in the direction of Fremont Island. With a few geography lessons, we started to get our bearings. These mountains that rise as islands within the lake often appear to be land on the shore. A new perspective is gained from the middle of the lake. We also could see the railroad causeway across the lake and the eerie appearance that the train was floating on water. In fact, many landforms seemed to be floating because the curvature of the earth is apparent, creating a strange mirage of a horizon line as mountains and shores disappear beyond it. We also traveled out toward Carrington and Hat Islands, getting a good view of colonies of California gulls and flocks of Wilson's phalaropes.

After lunch, Clay and Ted told us about their research and how surprised they have been by their discoveries. From first impressions, the lake system seems much more simple than other lakes and oceans because so little lives here and it is an ecosystem based on very limiting environmental factors – most importantly salinity. They have discovered it is much more complex than they expected. The mixing of fresh and saline waters creates unexpected conditions and often fluke events. Concentrated salt water is much heavier than the fresh water entering from the Jordan and Bear Rivers and other streams, as well as from under-

photos by Nancy Monteith

ground sources. This creates strata of fresh versus saline water in the lake where different organisms can be found. In fact, when a lot of fresh water pours into the lake, it can create a layer of fresh water that attracts fish far out into the lake, only to be trapped when the fresh water mixes with the salt water. Because of this phenomenon, trout and carp have been spotted in the middle of the lake!

We conducted a few experiments that helped us understand these phenomena. First, we dropped a clear cylinder into the water and let it sink to different depths. Each sample we pulled up had a distinct color and smell based on the salinity and dissolved gases in it. Next, we dropped a net in to collect brine shrimp and assess their numbers. We had seen these creatures all day along the side of the boat – the entire lake is swarming with them – but up close we could see their tiny features and unique colors. They have adapted to reproduce several times a year and in several different ways – live births (vivipory), eggs to hatch in the short-term, and cysts that can over-winter or lay dormant for many years until conditions are right for hatching.

After a cruise past Antelope Island to look for bighorn sheep, we made our way back to the marina, wondering why more people don't visit the lake. Our guides said they have only once seen a motorized boat out on the lake for fun. Sailboats often cruise the southern shores, but rarely venture to the middle of the lake to take in the experience fully.

The field seminar began with introductions, and every one of us started off with "My name is ___, I have lived in Salt Lake City for ___ years, and I have never been out on the water on the Great Salt Lake until today." I hope FOGSL can continue to change this pattern.

Ten people down, another 1.4 million to go.

photo by Nancy Monteith

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SUBMITTING MATERIAL FOR PUBLICATION

Mail or Deliver to: 1117 E. 600 S. Salt Lake City, UT 84102,
E-mail to: ldefreitas@earthlink.net. Please call 801-583-5593 to confirm receipt of e-mail or with any questions, suggestions, comments, or ideas.

Deadlines: Sept. 16 (Fall), Dec. 16 (Winter), Mar. 16 (Spring), and June 16 (Summer).

The Importance of Your Membership

The strength of FRIENDS comes from its members. All of you, with your individual contributions to Great Salt Lake awareness, help provide this organization with the momentum it needs to carry on its work for the lake. We all know about the tremendous challenges and opportunities for Great Salt Lake. Knowing those challenges and opportunities, FRIENDS' board of directors works hard to identify the best ways to respond to them. Some of our critical activities:

- The Legacy highway campaign
- Commenting on the Great Salt Lake Comprehensive Management Plan
- Educating the public at large about the importance of our big, salty neighbor
- Participating in public hearings and on committees that address development around the lake,

But without the support and participation of the membership, the work of the board is limited. General meetings, field trips, and volunteering are all ways that you can help build public recognition of FRIENDS and its mission. Through these means, you also become more knowledgeable about the lake, its science, its history, and our relationship to it.

One of the goals that the board continues to identify at its annual retreat is building membership. How can we develop a robust and active membership ? We need to develop a critical mass of lake advocates, true friends of Great Salt Lake.

So, we're asking you, our members, to keep active through participation and by keeping your membership current. Check your mailing label for your membership renewal due date. Renew promptly if you have expired.
If you have questions about your membership, please call Lynn at 801-583-5593.

And do what you can to help recruit new members to strengthen our voice foe Great Salt Lake protection and preservation. Help us recruit new members. Pass on your newsletter to a friend or neighbor. Spread the news about who we are and how we are working for Great Salt Lake.

Big Thanks!

PS. Does this sound like your mother?

Lake Fact Answer:
35,000 brine shrimp.

Thank You to Our New and Renewed Members for Your Support

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