FRIENDS of Great Salt Lake

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American Avocets on Chaplin Lake by Gary Crandall, 2006

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.

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Executive Director's Message

Oil and Gas Leasing on Great Salt Lake and the Public Trust. Why It's Important to Update the 1996 Mineral Leasing Plan.

"The Mineral Leasing Plan is 10 years old. It's time to take a look to see if there's new information or new issues concerning the division's public trust responsibilities and the mineral resources of the Great Salt Lake."

Joel Frandsen- State Forester and Director, Division of Forestry, Fire and State Lands

"Lux desiderium universitatus " (Light is the desire of the universe.)

Ivan Doig, Whistling Season

Last year on November 23, 2005, FRIENDS of Great Salt Lake, National Audubon Society, Great Salt Lake Audubon and the Utah Chapter of the Sierra Club filed a request for Agency Action on oil and gas leases that were publicly offered in the north arm of Great Salt Lake. The request was filed with the Utah Division of Forestry, Fire and State Lands (the "Division").

The Division is the supervisory authority for the management of sovereign lands in Utah, which includes those of Great Salt Lake. And as stated in the 2000 Great Salt Lake Comprehensive Management Plan (the "2000 CMP"), the Division will work in concert with the Department of Natural Resources, to fulfill overarching management objectives "to protect and sustain the public trust resources and provide for reasonable beneficial uses of those resources, consistent with their long-term protection and conservation."

Our request for Agency Action was in response to a public notice that the Division released on November 2nd. Hydrocarbon leases on 52 tracts (each tract is 4 sq. miles) of sovereign lands in the bed of Great Salt Lake were available. The tracts comprised approximately 130,000 acres in the northwest portion of the Lake, west of Promontory Point. This area is also adjacent to Gunnison Island, a protected area and the nesting site of one of the three largest breeding colonies of American white pelicans in the Western North America. It is also home to the world renowned and ever popular Spiral Jetty.

Combined with earlier 2005 lease offerings in smaller increments, all told, almost 178,000 acres within 78 tracts of this fragile and complex hemispherically important ecosystem could be open for oil and gas exploration. Each lease good for 10 years.

Our concerns focused on a variety of issues that included wildlife and important habitat, water quality, navigation, seismic activity and the need to update and revise the 1996 Mineral Lease Plan before moving forward with such leases.

We argued that under its public trust responsibility, the Division was required to provide site specific analysis of the leases and involve the public in the process. We held that although the 2000 CMP identified areas of the lake where oil and gas exploration could occur, it did not address the potential impacts that could come from this development. Nor did it address impacts, as stated in the management plan, to "sensitive ecological interests" that exist in the north arm of Great Salt Lake, where "even minimum human presence has shown to disrupt the birds using the north arm to the point that they move off [Gunnison] island to less productive habitat."

We raised concerns about seismic activities on Great Salt Lake where fault lines on the west side of Antelope Island, Fremont Island and Promontory were responsible for earthquakes in the 7.0 scale. Although this occurred 4,000 years ago, in geologic time, this is considered "recent "seismic activity. Studies that were begun in 1998 at the University of Utah Dept. of Geology and Geophysics by Dr. David Dinter, indicate that seismic activity in this area could be substantial and imminent.

We also requested that in addition to improving the communication mechanism between the Division, the public and the RDCC (Resource Development Coordinating Committee), which is charged with making final lease approvals, it was a good time to revisit the 1996 Mineral Leasing Plan.

Times have changed since 1996. There is more scientific data to consider about Great Salt Lake, such as the recent discoveries of high levels of methyl mercury in sediments and in wildlife. And perhaps, from a global perspective, it's time to reconsider where the greatest value of Great Salt Lake lies as a public trust resource. It is more valuable as a source of low grade asphaltium or as a precious hemispheric habitat?

Initially, the Division reasoned that the 2000 CMP guides the state in making decisions on behalf of the sovereign lands of Great Salt Lake. And that since the public was involved in the formulation of that planning document, there is no provision to include further public commenting opportunities as they proceed in determining the lease requests. Some leases had already been legally promised and that unless there is some infraction, there is really no opportunity for the public to appeal any of the decisions.

However, after a series of meetings and discussions between the Division, conservation cohorts, leasees, and respective legal resources, we reached an agreement. The agreement set forth terms and conditions that resulted in more than 116,000 acres of land eligible for lease to be held in abeyance from leasing, while just over 55,000 acres of land could go forward with leasing. This means that the lion's share of suspended acreage will remain in abeyance until the 1996 Mineral Leasing Plan can be reconsidered and revised.

Additionally, in the future, an improved communication mechanism supported by the Division will help guarantee expanded public involvement in tracking and commenting on oil and gas leases that are publicly offered before they are approved.

And as usual, for those leases that are currently moving forward, the operator must seek approval from the Division of Oil, Gas and Mining for a permit. This approval would include site specific analysis of the operation and its impacts, as well as an opportunity for public involvement.

So Frandsen is right. On behalf of the public trust responsibilities, it's time to consider new information and new issues that will help the Division do their very best. And it's also time for all of us, who understand how precious Great Salt Lake is as a natural resource and as a refuge for millions of migratory birds, to do our best as stewards for its long term sustainability.

En muchas salinas,

Lynn de Freitas

"Extractive and consumptive uses of the lake do benefit the state's economy and will inevitably continue. But our economic interest in the Lake are no more important than those of the pelicans or the eagles or of the microbiological species at the bottom of the food web that helps to support them."

Robert W. Adler,
Professor of Law, University of Utah.

FRIENDS ORGANIZATIONAL STATEMENT

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.

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 and other stakeholders 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 five counties surrounding Great Salt Lake have seen the program.

We hope that the DVD version of The Lake Affect, and Project SLICE, a 4th grade curriculum using Great Salt Lake as a system of study, will achieve a positive, long-lasting impact on the future of the Great Salt Lake and those who dwell upon its shores.

In 2003, FRIENDS awarded the 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.

On the Cover

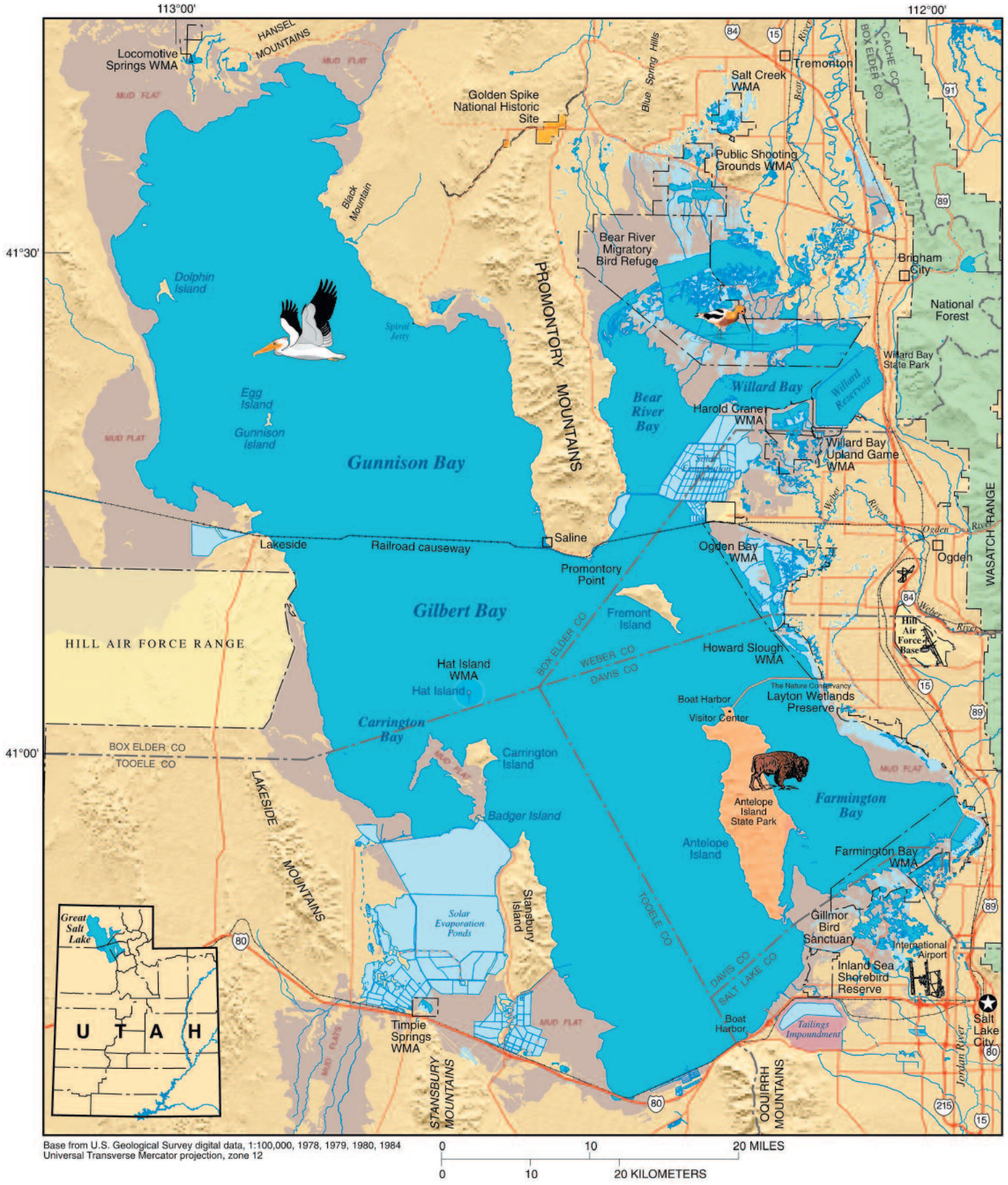
American Avocets on Chaplin Lake by Gary Crandall, 2006

Located in the prairies of southern Saskatchewan, Canada and important to migrating shorebirds, Chaplin Lake is a dedicated Western Hemisphere Shorebird Reserve (WHSRN) site and part of the complex of Old Wives and Reed Lakes (COR) which are also WHSRN sites.

Similar in some of its characteristics to Great Salt Lake, Chaplin Lake is a large, intermittent saline lake, bordered by a mix of public and privately owned lands that include mineral extraction and agricultural interests. Some harvesting of brine shrimp also exists there. And it supports a diversity of wetland and upland species, which includes the American avocet.

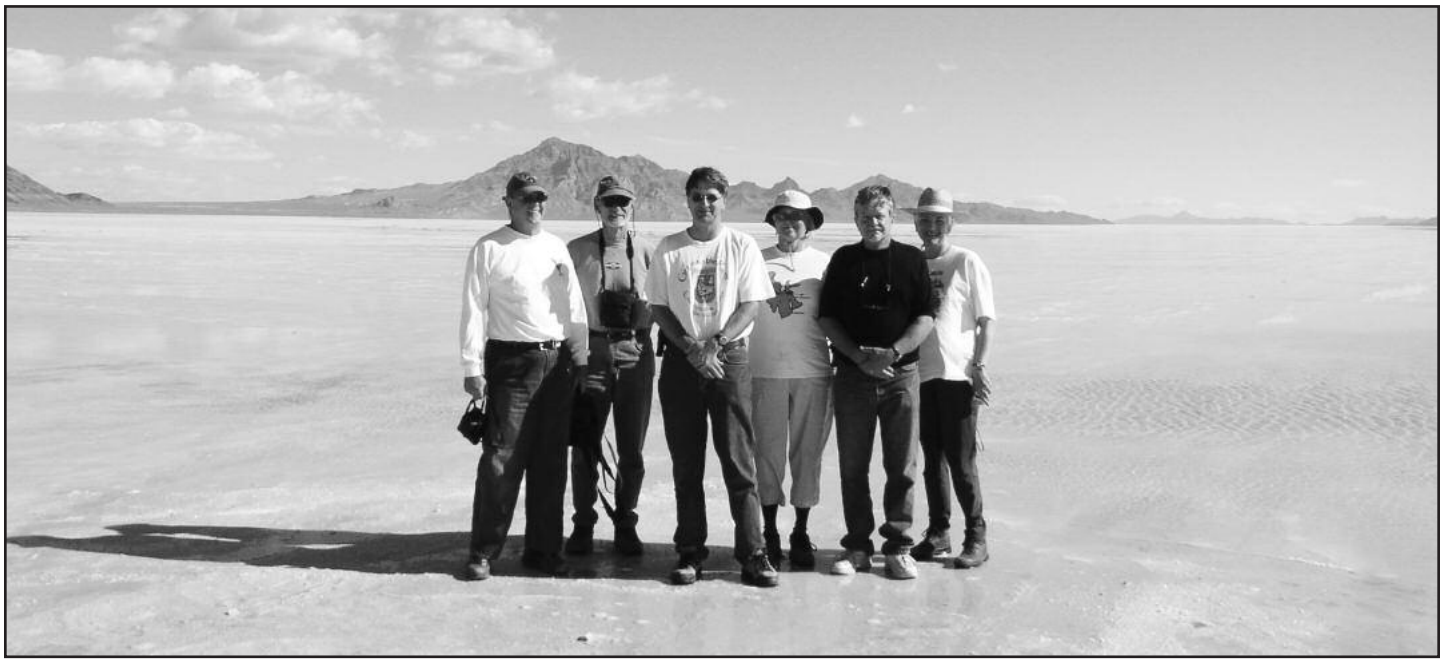
Gary Crandall traveled to Saskatchewan in the early summer to capture some of those migrating species that are also familiar to us at Great Salt Lake. For more information about Gary Crandall's work, contact him at Dancing Crane Studio, 801-296-9393 or visit www.dancingcrane.com

Great Salt Lake at a Glance



GSL RC&D

Working to Advance Conservation Practices



Great Salt Lake RC&D Board of Directors

The Great Salt Lake Resource Conservation and Development (RC&D) Council, Inc. is a nonprofit 501(c)3 organization guided by a group of volunteers which serves the needs of Tooele, Salt Lake, Davis, Weber and Morgan counties in northern Utah. It is part of 375 RC&D Councils in the United States, some of which started in 1962. These Councils receive the support of the USDA Natural Resources Conservation Service (NRCS) by way of paid staff and office for the organization. This unique private/public partnership has been effective in resolving challenges and opportunities relating to land conservation, water management, community development, and land management. The vision of the GSL RC&D is to promote conservation, development and stewardship of natural and human resources; promote sustainable economies; and enhance the quality of life.

The Great Salt Lake RC&D also has a history of participating in healthy partnerships that address a wide array of natural resource and community issues by leveraging funds to better meet the needs of local communities. Success stories include, facilitating the creation of the Bonneville Cooperative Weed Management Area that addresses weed issues across jurisdictional boundaries and successfully applying for grants for weed mapping, control, and education from the National Fish and Wildlife Foundation. In addition, GSL RC&D is helping to facilitate the Weber Watershed Plan that addresses the restoration, protection and maintenance of water quality of the Weber River Watershed in coordination and cooperation with local watershed committees operating in the Weber Basin. The GSL RC&D has been active in promoting Community Supported Agriculture (CSA) along the Wasatch Front. In addition, the Council has successfully competed for federal grants to help remote communities purchase and install community facilities and partner with local universities to perform sensitive species assessments in the Deep Creek watershed. Other areas of interest to the Council, include Mercury contamination, Biodiesel, and local markets.

There is a myriad of projects that the GSL RC&D can help local communities apply for and implement. If you'd like to get involved please contact Jeff Williams at (801)263-3204, 104 or jeff.williams@ut.usda.gov or visit www.greatsaltlakercd.org.

SOME REFLECTIONS ON GREAT SALT LAKE

COMMITMENTS OF COMMUNITY

I first laid eyes on Great Salt Lake in August of 1989, along with remnants of Bear River Migratory Bird Refuge. Without much prior introduction, both the Lake and Refuge did not look like much to me. The prior 8 years of my career were on Refuges in the heart of the Midwestern prairie wetlands with their tall grasses and lush prairie "pothole" vegetation. Frankly, on first impression, I had a lowly opinion of the entire area. Also, my intentions were only to stay for three years or so, then move on to a "plum" Refuge.

Little did I know the next 17 years would be spent right here, learning more than I could have imagined. My management style matured and changed as well as my appreciation for the environs of the Lake, the Refuge and the people living here. My intentions of making this a three year stepping stone to something better, turned out to be the final, longest and best assignment of my career.

A valuable lesson I learned was the importance of working with people when you are trying to save habitat and wildlife (or "dirt and critters"). People can be difficult to organize and manage, but I found it was worth every ounce of effort. Our local citizens provided the impetus to restore, enhance and expand the refuge. Their inspiration carried over to the Congress, resulting in special funding for over 10 years. Well placed citizen volunteers were instrumental in gaining State approval for the acquisition of over 10,000 acres of new lands for the Refuge. Refuge staff were likewise inspirational in their work ethic, and much of their work was recognized on the National level.

I also saw the entire conservation community become more proactive, coordinated and effective. In the early years of my career, Refuge Managers in general stayed within the boundaries of their Refuges and had minimal contact and coordination with those on the "outside". Right now, the number of ongoing projects involving a wide range of partners are too numerous to list, but they include all levels of state and local government, private organizations and individuals. Scarcely a month goes by when an issue is not elevated into the "community of organizations" around the Lake - either for analysis, support or opposition. Often times, the FRIENDS of Great Salt Lake are at the forefront, providing accurate and well delivered information and opinion to decision makers. Gaining that kind of clout was not easy, it took excellent leadership within the organization and intentional strategy to gain credibility. Good people doing good work.

And as a result, the FRIENDS of Great Salt Lake have made a difference. I hope and pray the organization remains strong and grows to meet the challenges of the future. The organization has my admiration and best wishes as it moves forward. Great Salt Lake has never been in better hands.

Al Trout,
former manager of the Bear River Migratory Bird Refuge

Antelope Island Panorama by Gary Crandall, 2006

Legacy Parkway and Preserve

A Balanced Approach

Artist's rendering of the Legacy Nature Preserve courtesy UDOT

The Legacy Parkway and Preserve has been a key topic of many discussions in our community over the last few years. Most discussions follow two central themes. First, community concern over transportation needs in Davis County. Second, concerns regarding the impact of the roadway on the natural environment along the shore lands of the Great Salt Lake. Years of planning, environmental documents and passionate involvement of citizens has resulted in a balanced approach to these difficult issues.

In this issue, we would like to update the FRIENDS of Great Salt Lake about the Legacy Nature Preserve. In the next issue, we will provide information about the Parkway.

The Legacy Nature Preserve

The primary purpose of the Legacy Nature Preserve is to offset the impacts to wildlife and wetlands caused by the Legacy Parkway. The Legacy Nature Preserve is a compilation of approximately 2225 acres from over 100 landowners. As land was acquired and the condition assessed for its 'nature preserve' qualities, our challenge was made clear. We asked, "What are the right steps necessary to ensure the success of the nature preserve?

We have taken the following steps to meet that challenge and to learn all that we can about the interaction between the natural and built environment.

The Collaborative Design Team

The Collaborative Design Team (CDT) is responsible for developing specific management recommendations for the Legacy Nature Preserve. Membership of the CDT is comprised of 12 individuals from various resource agencies and conservation entities (including FRIENDS of Great Salt Lake). They have developed an Adaptive Management Plan that provides goals for habitat, wildlife, water, education, public access and cultural resources.

The key is adaptive. As we implement the Adaptive Management Plan, conditions may or may not change as we expect. For instance, if water is added to a certain habitat, does the resulting plant growth and wildlife response occur as predicted? If after evaluating these changes they do not meet the goals, adaptive management activities will modify the initial plan to achieve the desired goals. This flexibility will best meet the specific needs of the preserve environment.

The Adaptive Management Plan is the overall guidance document for the Preserve and more detailed plans are being developed to address water, habitat, cultural resources, education and access issues. These are likely to be completed by the end of 2006 and implementation of those plans will begin immediately.

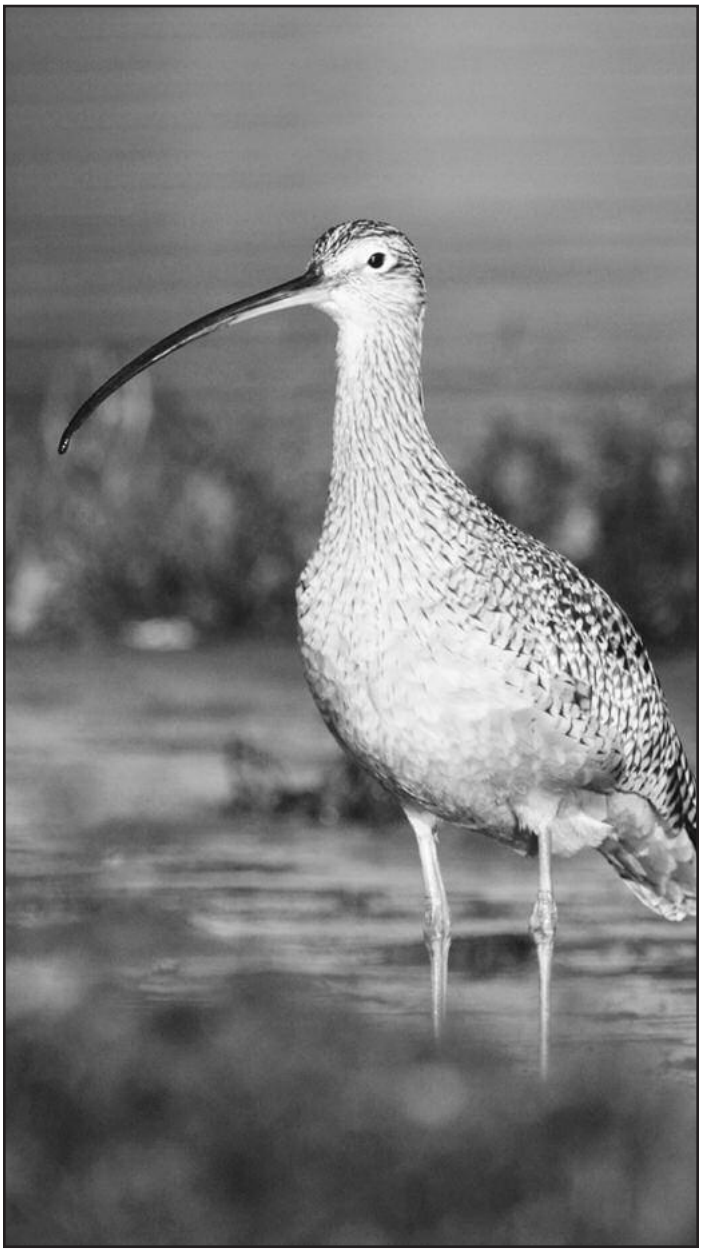
Noise Impacts on Wildlife Study
The Noise Impacts on Wildlife Study is currently underway and will provide an understanding of the relationship between noise from the roadway with avian reproduction and activity. Resource agencies and environmental professionals are conducting this five-year study. One of the goals of the study is to find ways to modify current built environment practices to benefit the natural environment.

Quiet Pavement
How does pavement relate to the Nature Preserve? The main contributor to roadway noise is the pavement surface and type of material. In previous plans, the pavement to be used would have created significant noise. Today, we will be constructing the Parkway with a quiet pavement, reducing the noise level by more than half for the benefit of both wildlife and local communities.

Science Advisory Committee
A Science Advisory Committee will guide scientific study in the Preserve. This Committee is comprised of highly qualified scientists from universities and various agencies. The Committee has begun to familiarize themselves to the project and their roles and will meet in September to define some scientific activities to be undertaken. For example, the Preserve lends itself to a study of the effect of road salts on plant life, water quality and wildlife impacts. A scientific focus will provide better understanding of the relationships between the natural and built environments. We are looking for topics that are of interest to study and encourage you to contact Lynn with any recommendations.

Clean Water Act Section 404 Permit
The Army Corp of Engineers issues the 404 permit based on compliance to their varied and detailed conditions. Among their requirements, they provide descriptions of habitat success criteria, multiple references to the Adaptive Management Plan, and deed restrictions maintaining the Preserve as wetland and wildlife habitat in perpetuity. In fulfilling the conditions of this permit, it will be necessary for on-going coordination between the Adaptive Management Plan, the Science Advisory Committee, the Collaborative Design Team and the Noise Impacts on Wildlife Study.

Additional 125 acres for the Legacy Nature Preserve
An additional 125 acres of land has been added to the original 2100 Preserve acres. This land is located on the western boundaries of the 500 South interchange and will be managed with the rest of the Preserve.



Long-Billed Curlew courtesy SWCA

Through these steps, the preserve will evolve into the successful community asset that we have envisioned. There are many dedicated individuals and groups, including Lynn de Freitas and the FRIENDS of Great Salt Lake, who are effectively and tirelessly working to ensure that the Legacy Nature Preserve provides critical habitat along the shoreline of the Great Salt Lake.

John Thomas,
Project Director, Legacy Parkway Team, UDOT

SHOREBIRDS

WINGED AMBASSADORS OF THE WESTERN HEMISPHERE

Workshop Participants courtesy Suzanne Fellows

Those familiar with the biological resources of the Great Salt Lake understand its vital role in shorebird ecology. But how many of us have ever stopped to contemplate what a page from a sandpiper's travel journal might look like? What other cultures and people do our Great Salt Lake shorebirds encounter in their annual migratory treks between breeding and wintering grounds? In April, a group of instructors got together to learn about these feathered ambassadors through the Shorebird Sister Schools Program (SSSP).

The SSSP was developed in the early 1990s by the U.S. Fish & Wildlife Service (USFWS) and several partners to develop a network among Alaskan students and help them explore the phenomenal shorebird resources of Alaska. The program has since expanded to 23 countries. Shorebird trunks, student activity guides and a newly revised and expanded curriculum are available to assist in learning about shorebird biology, habitats and conservation. Shorebird tracking and research projects and access to shorebird biologists, are available via the SSSP website (http://sssp.fws.gov).

Opportunities are available to participate in cultural exchanges with students in Mexico, Japan, Russia and Argentina. Educator workshops are conducted to encourage teachers to integrate the program into their classroom curricula and expose their students to shorebirds and their habitats. Local projects and conservation activities help students and communities put knowledge into action.

The spring workshop involved nineteen classroom teachers from Utah and four educators from Mexico.

Be a Shorebird courtesy Suzanne Fellows

Many had never heard of a shorebird or explored Farmington Bay. Teachers participated in activities to introduce them to bird adaptations, the perils of migration, the importance of wetland habitats, invertebrate resources, shorebird identification, and cultural connections. The importance of the Great Salt Lake ecosystem to shorebirds and the importance it plays in providing crucial habitat to shorebirds found throughout the Western Hemisphere were repeatedly demonstrated. By the end of the two day workshop, they could identify different species of shorebirds, explain their habitat needs and discuss why they were an important shared resource.

The workshop was sponsored by the Davis County School District, Farmington Bay Education Center, Intermountain West Joint Venture, Nayarit and Utah Linking Communities Initiative projects, USFWS, Utah Division of Wildlife, Utah State University, and several other partners.

The highlight of the workshop was the presence of Victor Castillo, Leticia Martinez, Gildardo Carlos, and Abel Castillo. Principals and classroom teachers of students in Nayarit, Mexico, the four educators use shorebirds in their schools and as the central theme for their January Bird Festival (see the Spring 2005 newsletter). The primary translators during the workshop were Ogden teachers Cristina Lopez, Matt Gunn, Katie Baldwin, and Megan Saine. The Utah teachers will participate in the Mexico bird festival, explore shorebird and wetland habitats and visit with local students in January.

By considering their differences in language and culture as opportunities to learn and improve life skills, rather than seeing them as barriers, these 23 teachers demonstrated how their own communities are important links in the chain of healthy habitats vital for migratory species.

Suzanne D. Fellows
Assistant Nongame Migratory Bird Coordinator
US Fish & Wildlife Service

A Slice of S.L.I.C.E.

RIGHT ON YOUR HOME COMPUTER!

We are happy to announce new developments with our Salt Lake Initiative for Conservation Education, or Project S.L.I.C.E. to those already familiar with our educational suite of Great Salt Lake educational resources.

Way back in 1997 FRIENDS hired Bruce Thompson, an outstanding environmental educator, to develop "The Lake Affect" slide presentation for outreach and education in communities bordering Great Salt Lake. "The Lake Affect" slide presentation was incredibly successful and is still presented to interested audiences ranging in age from 5 - 95. We have now developed a wonderful DVD version that is available for sale. Through the sale of this informative DVD, we hope to reach more audiences than ever before.

Although "The Lake Affect" slide presentation was useful, area teachers were clamoring for additional and more extensive educational resources on Great Salt Lake. So, FRIENDS hired Bruce to develop and prepare for publication twelve units of fourth-grade instruction based on Utah State Science Core curriculum standards.

The development and implementation of our S.L.I.C.E. curriculum has been a long process. To date, we have completed and field-tested seven of the original 12 units of study. The units include: Overview & Orientation To Great Salt Lake; Properties of Water; Watersheds and Cycles: Great Salt Lake, Past & Present; The Greater Great Salt Lake Ecosystem: Where Forests, Wetlands and Deserts Meet; Wetlands Work; Lakeside Learning: Field Trips to Great Salt Lake; and Supplemental Activities for the Classroom.

FRIENDS is excited to announce the public unveiling of these units with an educator's guide to resources on our website in upcoming months.

We are currently translating each of the units into a PDF format, which is easily readable and readily downloadable by any computer operating system. The transformation is currently underway and the units will appear incrementally on our website. Upon completion, we will launch a marketing campaign to fourth grade teachers state-wide to ensure future use.

Taken together, these units weave a fascinating tapestry that highlights the many features and processes of the Great Salt Lake Ecosystem. Science based activities, discussions, projects, and field trips can be used throughout the academic year. The greatest thing about the curriculum is that it is place-based. It teaches students through the relevant and accessible conduit of the Greater Salt Lake Ecosystem about our many connections to the lake and provides an important foundation for lifelong learning, civic pride and stewardship of our big salty friend.

Other developments with S.L.I.C.E. include a recent re-evaluation of the direction of our future educational efforts. Last Spring we conducted a detailed survey of educators who have used SLICE materials in their classrooms or participated in some way with our educational services. Our education committee and board are currently assessing where our limited resources will best be utilized in our future educational endeavors and it seems logical to expand the reach of our GSL education beyond the fourth grade. So, you can look for exciting developments in our educational programming in upcoming months. We also hope you will consider making an additional donation to our S.L.I.C.E. programming when you renew your membership. (Don't forget to check the date above your name and address on the back page of the newsletter.)

A Slice of S.L.I.C.E.

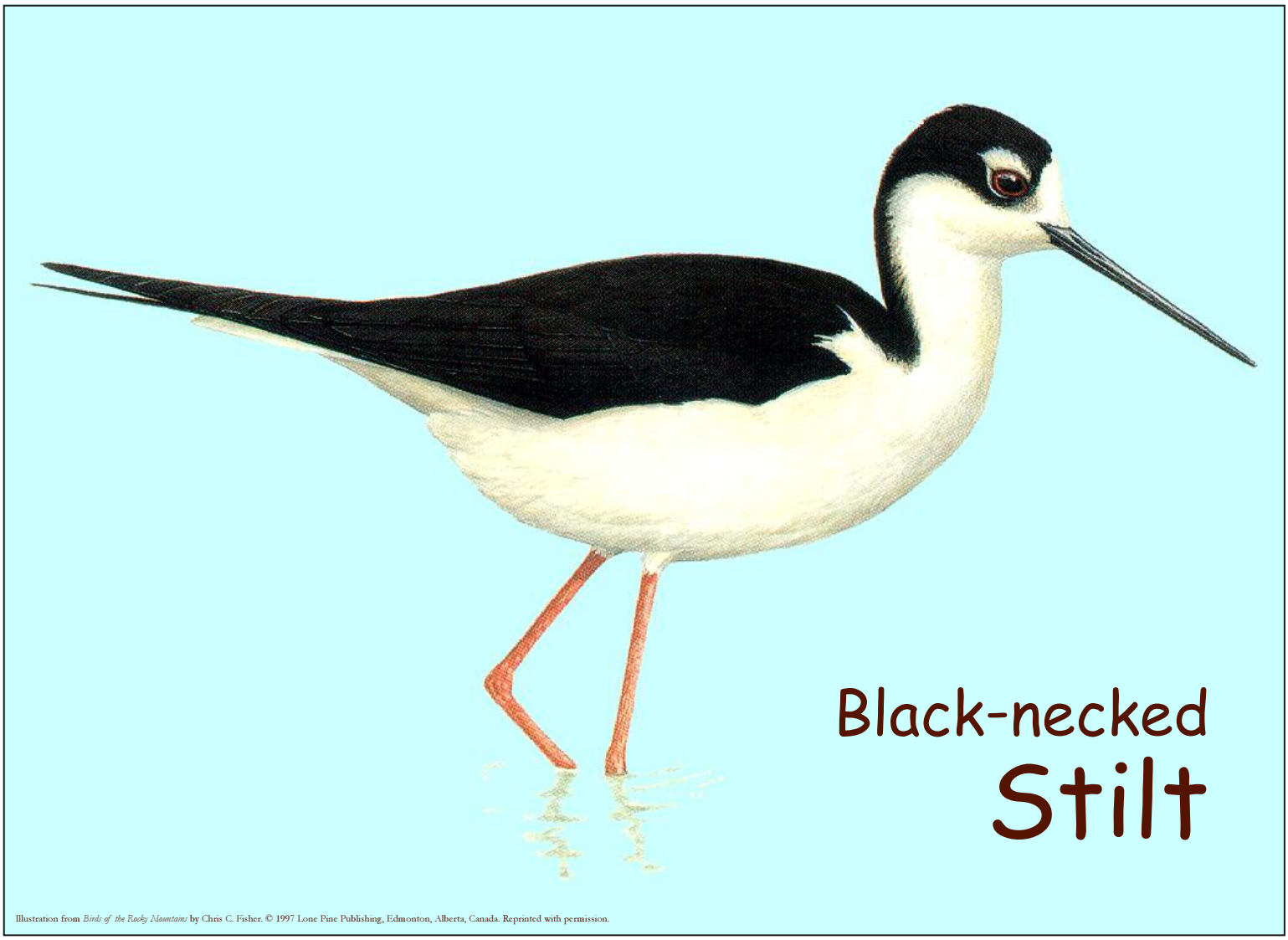


Illustration from *Birds of the Rocky Mountains* by Chris C. Fisher. © 1997 Lone Pine Publishing, Edmonton, Alberta, Canada. Reprinted with permission.

A product of Project SLICE: The Friends of Great Salt Lake Initiative for Conservation Education
Produced in collaboration with EcoTracs, Salt Lake City, Utah 801/467-3240 ecotracs@aol.com © Friends of Great Salt Lake revised 09/18/01

The Black-Necked Stilt

Population size at GSL: Mean numbers for '97-'99: 15,084; for 2000: 18,423. As many as 65,000 have been known to visit GSL, much higher than any other wetland in the Pacific Flyway.

Food: especially brine flies, brine shrimp. Also crayfish, snails, few fish, tadpoles, some seeds of aquatic plants.

Habitat: marshy lakes and ponds; foraging: lake edges and exposed mudflats, shallow lakes (fresh and alkaline).

Nesting: often near prairie wetlands; may be open or partly concealed; on dry and water-bounded mound above tide line, on flooded flats with 360° view. Occasionally of mud, sticks, shells, and debris, lined with pebbles, shell bits, sticks. Eggs often wet. Nest colonies sometimes mixed with avocet colonies. Stilts and Avocets even occasionally lay eggs in each others' nests. Stilts more partial to fresh water than the Avocets.

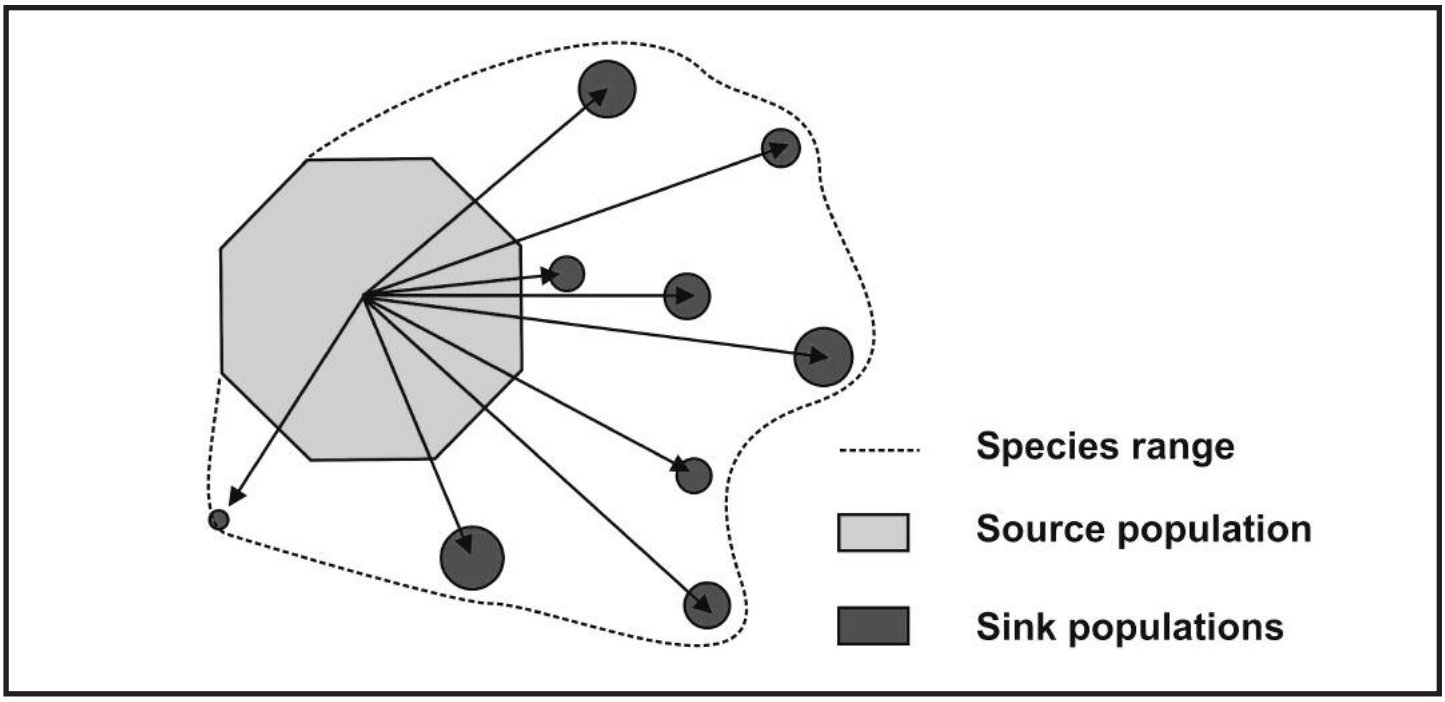
Best places and times to see them at GSL:
Best times to see them at GSL is spring/summer.
Best places are Cutler Marsh, Amalga Barrens, Bear River Migratory Bird Refuge, Antelope island State park and Causeway, GSL South Shore.

DR. EPHYDRA - WE WELCOME YOUR QUESTIONS VIA EMAIL OR PHONE

E•phy'•dra, a noun; a genus of two species of brine flies that live on the bottom of the Great Salt Lake as larvae and pupae, and along the shores of the Lake as adults.

Brought to you by the Science Committee to help explain the science surrounding Great Salt Lake. We welcome your questions via email or phone. Contact Lynn de Freitas at ldefreitas@earthlink.net

SINKS AND SOURCES IN AVIAN POPULATIONS



Source-Sink Population Structure courtesy Stan Guffey

In the world of biological population dynamics, one often hears the terms "sinks" and "sources" used to describe the stability and long-term trends apparent in a given population. Although relatively basic in concept, their implications are far from simple.

Sinks and sources are most easily thought of conjunctively in terms of both habitat and populations. A sink population can be defined as that in which reproduction is insufficient to balance mortality. Thus the population can persist in the habitat only by being a net importer of individuals from elsewhere. Sink populations occupy habitats in which reproductive output is inadequate to maintain local population levels and must be replenished by emigrants from source populations if they are to remain viable over the long term. Sink habitat is often poor and/or subject to other impacts such as disturbance or high mortality. Conversely, source populations successfully produce a net gain in individuals over the long term and become exporters to surrounding areas.

For example, in the source-sink population structure portrayed above (courtesy of Stan Guffey, University of Tennessee), the species range is indicated by the dashed line (much as you might find delineated in a field guide). However, individuals of the species are not found in all parts of the range, nor are they evenly distributed. The population consists of a larger source (or core) population and a number of sink (or satellite) populations. Reproduction in the source population exceeds maintenance levels. As indicated by the one-way arrows, excess reproduction in the source area supplies the populations of the sink areas where net reproduction is generally insufficient to maintain populations. In this source-sink population model the habitat of the source population is conducive to net reproductive output. The sink popula-

tions are found in marginal habitats where resources are generally insufficient to maintain population levels.
As noted by Dr. John Cavitt and others, for many avian species, including those that utilize the Great Salt Lake Ecosystem, nest predation is frequently considered the most common cause of nest failure. However, the relationship between predator abundance and nest predation can vary considerably across spatial scales. Environmental conditions at the local and regional level can influence predator abundance and activity, and thus the likelihood of nest predation. Locally, variation in habitat features such as vegetation associations, successional stages, habitat quality, etc. can influence the distribution and abundance of nest predators.

Habitat fragmentation, a feature frequently encountered in human-dominated landscapes, is evident along the eastern shore of the Great Salt Lake. Although habitat fragments and resulting edge effects offer a variety of benefits such as increased and more diverse food sources, they also offer potentially serious risks to avian populations occurring within the fragment or patch. These risks include increases in competition and greater exposure to predation because fragmentation increases the amount of edge or exposure per unit area of habitat. However, the amount of predation resulting from the edge effect at a given location is also a function of the composition of the surrounding habitat.

Whether defined as a source or sink, populations and/or habitat can shift from one category or the other depending on environmental conditions. For example, in areas with high annual variability in habitat quality resulting from fluctuations in precipitation and other factors, sources and sinks may shift periodically. These types of shifts could potentially rescue a population that would otherwise have been in danger, or vise versa.

Considerable effort can and should be directed towards the presence or absence of source and sink populations and their causes, but in the end we always come back to the point that it's all in the habitat. To a large extent, habitat availability and quality control populations and all those factors that influence them.

Dr. Thomas Twedt and Michael Sipos,
BIO-WEST, Inc.

Snowy Plover Sitting on Eggs by Ann Neville

Discovering Our Lake

Lee Creek Natural Area

Birding at Lee Creek by Gary Crandall, 2006

Great Salt Lake is an internationally recognized treasure of great importance for millions of nesting and migrating birds. Within the Great Salt Lake Ecosystem, Lee Creek Natural Area is a key site for avian biodiversity and part of a large complex consisting of Kennecott's Inland Sea Shorebird Reserve and the South Shore Preserve which includes National Audubon Society's Gillmor Sanctuary and Utah Reclamation Mitigation Conservation Commission properties The Lee Creek Natural Area complex, part of a larger ecological unit Gilbert Bay, was accepted in 2004 as a BirdLife International and National Audubon Important Bird Area. This identified Gilbert Bay as part of a state, hemispheric and global network of places recognized for their outstanding value to bird conservation.

Lee Creek's proximity to the Wasatch Front population center, easy access, and lack of fencing or signage has long resulted in heavy illegal trespass. Degradation of wildlife habitat through disturbance, compaction and pollution has been severe. In addition, the illegal use of motorized vehicles on this property has created a pathway for erosion and sediments, litter, and petroleum products to enter Great Salt Lake through natural drainage or by connection to Lee Creek. The Lee Creek area has also served as a gateway for unauthorized trespass on miles of shoreline and thousands of acres of adjacent public and private land being managed for wildlife.

These threats prompted the National Audubon Society (Audubon), Kennecott Utah Copper Corporation, The Nature Conservancy, the Utah Reclamation and Mitigation Conservation Commission, and Cephalon to join forces, acquire the Lee Creek property, and begin a restoration program that allows the land to heal and once again function as a healthy natural ecosystem.

Audubon currently manages the 305-acre Lee Creek Natural Area as part of the South Shore Preserve. The Rio Tinto BirdLife International Program provided a substantial grant to help fund restoration and education activities.

Vision

The vision for the Lee Creek Natural Area is to transform what is now a severely degraded habitat into a healthy vibrant place for wildlife, and a tranquil place where the community can experience the natural beauties of Great Salt Lake. Wildlife-compatible activities such as sunset viewing, bird watching, photography, and quiet appreciation of the views and beauty of Great Salt Lake are positively encouraged.

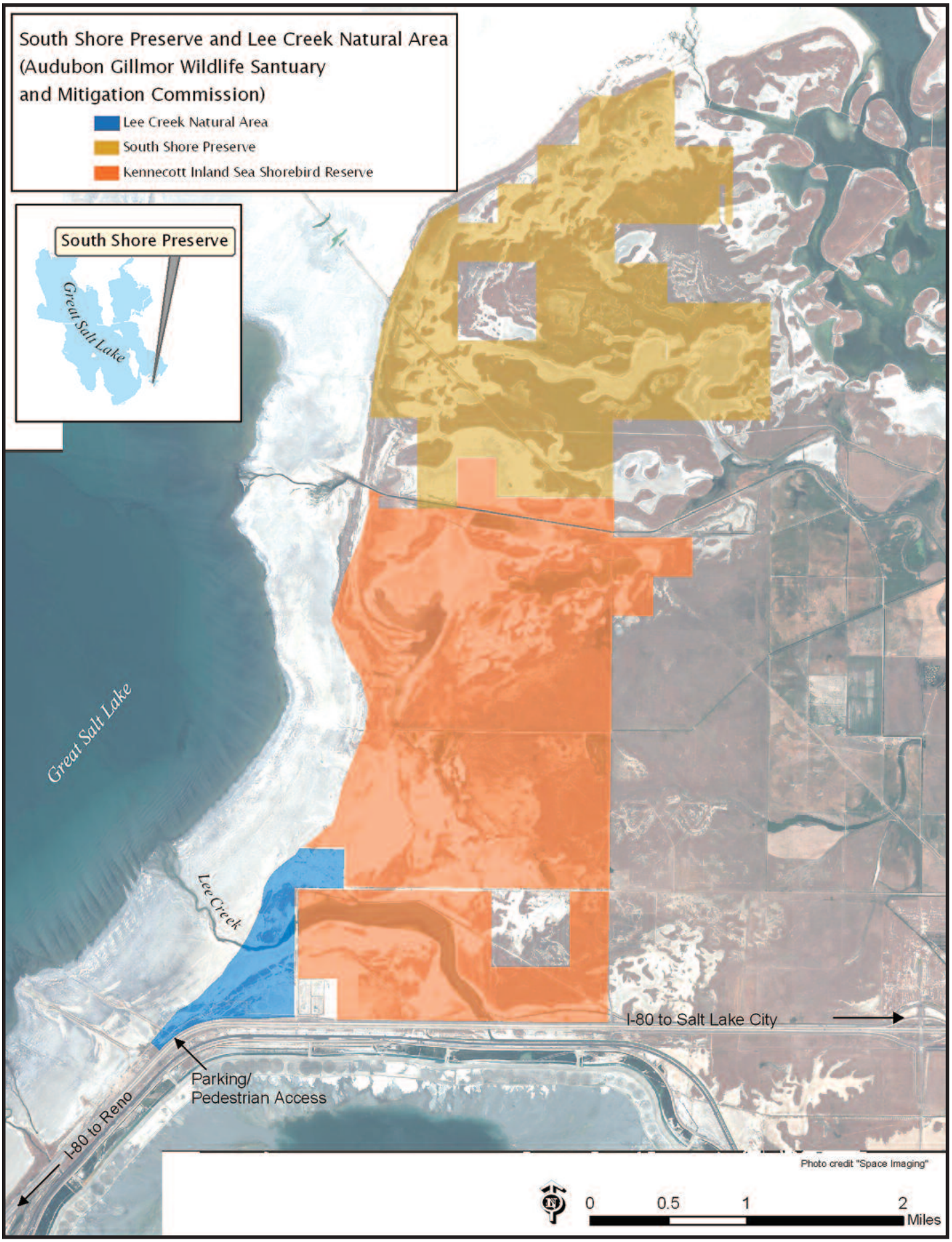
Education

One of the main objectives of the Lee Creek Natural Area is to raise community environmental awareness by facilitating more effective Lake access for visitors. Lee Creek Natural Area provides the closest and least restricted access to the shoreline of Great Salt Lake for visitors from Salt Lake City. The vision of implementing a drastic change of land use from destructive activities to one of positive habitat and wildlife management is ongoing and depends on cooperation and commitment from many organizations and agencies.

Location

To reach the Lee Creek area, take I-80 west toward Reno to Exit #111, 7200 West. Turn north at the stop sign, then turn west onto the frontage road that parallels the interstate. Drive west five miles to a small parking area north of the road.

For more information, call 801-355-8110 or log on to www.audubon.org/local/scnctuary/leecreek.



Lee Creek Map courtesy URMCC

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Special Thanks
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Lake Fact:

Name the boat that was used to haul stock from Antelope Island during the high water years of 1854-1855?

Answer: The Timely Gull

GREAT SALT LAKE PEOPLE

Henry Maddux, USFWS Utah Field Supervisor since 2000, will be moving to the Regional Office in Denver, CO. It has been a great pleasure working with Henry and we wish him all the best.

Jason Groenewold, HEAL Utah's Executive Director for the past 8 years, has left to pursue a joint degree in law and business administration at the University of Utah. Jason has worked tirelessly with others to keep nuclear waste out of Utah. You go, boy!

Happy Birthday to Tim & Candy Dee. May you have many happy returns.

Amy Marcarelli, Ph.D, formerly at USU, working with Dr. Wayne Wurtsbaugh on Great Salt Lake research and former FRIENDS board member, has taken a position at Idaho State University in Boise. You go girl!

Capt. Jack Comeford, Great Salt Lake sailor. scientist and long time supporter of FRIENDS died on July 15th. Jack was a gentle spirit and cared deeply about Great Salt Lake. He will be missed.

We want to thank **EJ McCaffrey** for his service on the Board and wish him well in his professional pursuits.

Help Wanted

FRIENDS is looking for new Directors for our Board and participants on the Education Committee and Science/Research Committee.

Contact Tim Brown with questions.

Help us Help the Lake

Your donations go directly to the preservation and protection of Great Salt Lake. We can't do it without you. Please check the back cover to see if it's time to renew your membership. Thank you.

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Chaplin Lake Shuttle by Gary Crandall, 2006