

# FRIENDS of Great Salt Lake

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Soft Snowy by Gary Crandall

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.

www.fogsl.org

### YOU CAN LEAD A HORSE TO WATER BUT : GREAT SALT LAKE ADVISORY COUNCIL PROVIDES USEFUL TOOLS THAT COULD HELP IN OUR WORK TO SUSTAIN THE LAKE

"If through scientific and economic analysis we can show the benefits that the natural environment offers, and show that the economic value is not zero,

this gives policy makers a vehicle for addressing our fragile ecosystems."

-Edward B. Barbier, Professor of Economics, University of Wyoming

uses are unaccounted for.

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The road toward protecting Great Salt Lake for future generations is not as straight or as smooth as we might like it to be. As long as we have a management regime that is designed to facilitate multiple-use and sustained yield principles, there will be a tug of war between preserving the ecological integrity of the system and expanding development of the Lake's resources to generate more jobs and more output.

That's why it was terrific news to read the two studies commissioned by Governor Herbert's Great Salt Lake Advisory Council (Advisory Council) in 2011. The studies, which were presented to the Natural Resources Ap-

propriations Subcommittee during the 2012 Legislative Session generated insightful and compelling data about the importance of the Lake. Data that can help the Division of Forestry, Fire and State Lands (the Division) - responsible for managing the Lake - as it continues to grapple with this dynamic tension. And data which most certainly should inform the management strategies in the revisions of the Great Salt Lake Comprehensive Management Plan and Mineral Lease Plan, which are in final draft form and inviting public comment until April 26th. See: www.gslplanning.utah.gov

The studies – "Economic Significance of the Great Salt Lake to the State of Utah" prepared by Bioeconomics, Inc., and "Definition and Assessment of Great Salt Lake Health" prepared by SWCA Environmental Consultants, confirm that the health of Great Salt Lake and the direct economic benefits of the Lake are inextricably linked. And that the total economic output that the Lake contributes to the State of Utah's GDP through recreation, mineral extraction and the brine shrimp industry is \$1.3 billion annually. Review the studies at: www.gslcouncil.utah.gov

FRIENDS of Great Salt Lake

Right now, cumulative permitted The studies also emphasize that further work is required in both areas to develop a more comprehensive understanding about the synergy that exists between the Lake's ecological health and the array of uses that generate

ing about the synergy that exists between the Lake's ecological health and the array of uses that generate output, income and employment. But because the Advisory Council can only serve in an advisory capacity, it cannot affect policy or management practices. Only the Divi-

sion of Forestry, Fire and State Lands can do that.

Thanks to the Nature Conservancy of Utah for funding

the studies, the significance of these findings is that we

have finally initiated a scientific and economic analysis of

the Lake to justify its overall value as an ecosystem worth

protecting. Big briny hugs, everyone!

Right now, cumulative permitted uses of the Lake are unaccounted for. The Division has no plan to determine what the long-term vision of ecological health of the Lake is supposed to be. And except for the insights that were gained from the Great Salt Lake Health study, there is no way of knowing whether or not the ecological integrity of the system is in peril.

That's why FRIENDS believes that this is an excellent time for the Division to adopt a prudent management approach for the Lake. It should shift its management focus from resource use and development to resource protection and preservation. Such an approach would ensure that nothing is left up to chance about where we are headed with the future of Great Salt Lake. A tool that could help with this is the Great Salt Lake Health study.

This study was conducted by a blue ribbon panel of Great Salt Lake experts working with a process called Conservation Action Planning. Lake health in this case refers to ecological health which is determined by how well the lake functions to support significant bird populations, brine shrimp and reeflike stomatolitic structures.

Working with the lake in its current physical form – causeways, dikes and impounded wetlands – the panel considered each of the 4 bays – Gunnison, Gilbert, Farmington and Bear River. They chose to define health for eight ecological targets in and around the lake up to an elevation of 4,218'. (Historic average surface elevation is 4200' asl).

The targets were selected because they represent the full range of biological diversity (different bird species, microbial life, salinity, and habitats) of the Great Salt Lake ecosystem. The ecological targets are: open waters of the bays, unimpounded marsh complexes, impounded wetlands, mudflats and playas, isolated island habitats for breeding birds, alkali knolls, grasslands and agricultural lands. Using these targets, each bay was rated for its current state of ecological health from very good to poor.

Although the findings indicate that the current ecological health of the Lake is relatively good, some bays are doing better than others. And many of the targets could not be thoroughly evaluated because of insufficient data, which means that more research is necessary to fill those important information gaps.

The study identified a number of existing and future stresses that could not only degrade these conditions, but have far reaching implications that "threaten the integrity of Great Salt Lake habitats and the ability of migratory bird species to use the Lake ecosystem." These stresses include reduction in lake levels that can cause a variety of impacts on the brine shrimp population, island nesting birds, and salinity. Phragmites - an invasive plant that thrives during low lake levels and degrades habitats. And the loss of alkali knolls – important shrubby mudflats.

So where do we fit into all of this in our role as stewards for Great Salt Lake?

Submitting comments by the April 26th deadline on the revised Great Salt Lake Comprehensive Management Plan and Mineral Lease Plan is the first step. Emphasize that the public must be involved in the heart of the process for evaluating new and renewing proposals for resource development. Insist that site specific planning be a part of each proposal before it is submitted. And urge the Division to initiate the development of a long-term plan that will ensure ecosystem health and biotic integrity for Great Salt Lake. The plan should include goals, conservation targets, threats, monitoring strategies, and appropriate actions that will protect and sustain the trust resources of the Lake. Together we can work toward a future for the Lake that is both environmentally and economically beneficial for all of us. We have the tools to do it and the numbers to prove it.

In saline,

Lynn



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Over the past 4 years, FRIENDS has been extremely fortunate to have Emily Gaines working with us as our Education and Outreach Director. Through her dedication and hard work, Emily has inspired all of us to be better Lake educators and Lake advocates. She was truly a gift to FRIENDS and Great Salt Lake. We wish her all the best in her new position with the University of Utah. Thanks Em!

What you can do:

Visit www.fogsl.org to review our draft of talking points.



Sandhill Crane by Rosalie Winard



### FRIENDS ORGANIZATIONAL STATEMENT

FRIENDS of Great Salt Lake is a membership-based nonprofit 501c3 organization founded in 1994. The mission of FRIENDS is to preserve and protect the Great Salt Lake Ecosystem and to increse public awareness and appreciation of the lake through education, research, and advocacy. The long-term vision of FRIENDS is to achieve comprehensive watershed-based restoration and protection for the Great Salt Lake Ecosystem.

FRIENDS has a very active Board of Directors and an Advisory Board consisting of professionals in the scientific, political, literary, eduction, and broadcast communities. The organization sponsors an array of programs, activities, and materials in pursuit of its mission.

Every two years, FRIENDS hosts the Great Salt Lake Issues Forum to provide a focused discussion about the Lake for policy makers, researchers, planners, industry and other stakeholders. 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.

The Friend of the Lake award, given at each forum, acknowledges a citizen, business or organization working to promote Great Salt Lake awareness in the community.

In 1997, Bruce Thompson was hired as Education Director to initiate a 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." The program is now available on DVD.

In 1998, the Utah Chapter of the Wildlife Society awarded FRIENDS the Conservation Achievement Award..

In 2000, Project SLICE, a 4th grade curriculum using Great Salt Lake as a system of study, was initiated. The Lakeside Learning field trip program, a component of SLICE, continues to grow.

In 2002, the Doyle W. Stephens Scholarship Award was established. The scholarship provides support to undergraduate and graduate students engaged in new or on-going research that focueses on Great Salt Lake.

In 2002, Lynn de Freitas was awarded the outstanding volunteer educator award by the Utah Society for environmental Education.

In 2006, FRIENDS was the recipient of the Calvin K. Sudweeks Award from the Utah Water Quality Board for outstanding contibutions in the water quality field.

Andrea Nelson, hired in 2012 as Education & Outreach Director, is working to refine the Project SLICE curriculum and expand education outreach into the Great Salt Lake community.

### On the Cover

Soft Snowy by Gary Crandall

I've been photographing Great Salt Lake wildlife and lakescapes for almost 20 years. Every time I'm out at the lake, the wetlands and the different species of birdlife lift my spirits. Not only is the lake one of the most important ecosystems in the West but I think others find it just as inspiring. I urge you to keep supporting FRIENDS and its work to help ensure the lake's future.

After many years in Salt Lake City, Gary Grandall has recently moved his studio to Jackson Hole, Wyoming. You can find him at Gray Crane Studios, inside The Jackson Trading Co. on the square in Jackson.

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# 2012 GREAT SALT LAKE ISSUES FORUM Changing Conditions and the Future of Saline Lakes



Watery Sunset at Great Salt Lake by Charles Uibel

### University of Utah, Salt Lake City May 10 + 11th

### Pre-Forum Session on Mercury May 9th (free to the public) Post-Conference Field Trip May 12 + 13

Guest speakers at the Forum will address issues facing Great Salt Lake, Dead Sea, Salton Sea, Owens Lake, Mono Lake, and more

### Register Now at http://www.fogsl.org/issuesforum/2012/

When it comes to protecting these unique and challenging saline systems, there are no easy answers. But the more we understand the systems, the better we'll be at effective management strategies. At the 2012 Great Salt Lake Issues Forum, we'll look at how people work to sustain the unique habitats these saline systems provide. Each system has special challenges, special virtues, unique economic benefits, and special solutions. Taken together, we may be able to see patterns, understand possibilities, and create inspiring solutions. I hope you'll join us.

- Lynn de Freitas, Executive Director FRIENDS of Great Salt Lake

Thank you to our 2012 Issues Forum Sponsors:

CH2MHill • Dr. Kenneth Sassen • Great Salt Lake Brine Shrimp Cooperative, Inc • Great Salt Lake Institute • POTW Jordan River Farmington Bay WQ Council • The Nature Conservancy • Utah Wetlands Foundation • Weber State University College of Science and Department of Zoology



### PRESERVING A LINK WITH THE LAKE'S PAST

### Student Perspectives On History & Archaeology

Have you ever moved into a home and wondered about the people that lived there before you? Did you look at the way they decorated and infer things about them? Archeologists do this every day but in a slightly different way. For thousands of years people have lived in the same areas we live in. They occupied caves and land that surrounds what is now present day Great Salt Lake and they too left behind evidence of their lives. Archeologists use this evidence to learn more about these people. It is their link to the past. It connects us with our heritage, the world, and the resources we have around us. When these links are broken they are irreplaceable.

Earlier this year, we went with Project Discovery, an archaeology program for high school students, to record rock art in Danger and Jukebox caves near Wendover, Utah. The caves are located on the shoreline of the ancient lake Gilbert which covered the Great Salt Lake area approximately 11,000 years ago. Many artifacts and other types of evidence have been found in these caves that links back to the prehistoric people who utilized the Great Salt Lake ecosystem. Fabric and basket scrapes, bones, tools, and weapons are among the many artifacts that were discovered in these caves. Plant material was also found, of which, 68 species, such as pickleweed, still grow in the area. By evaluating rock art and other evidence, archeologists have learned about the culture and lifestyle of these people. The Great Basin Desert people lived in small, extended family communities. Their way of life was formed on the basis of day to day survival. They were hunter-gatherers and ate pine nuts and other seeds as well as meat from local animals including deer, antelope, fish, and rabbits. They didn't endeavor to create their own shelters but relied heavily on the natural formation of the land for shelter.

During our trip we were responsible for recording a large panel of rock art by drawing sketches of the original art work. In the center of this panel was a large section of modern day graffiti. One of the most beautiful and prominent rock art figures, a beautiful deer-like animal, was not even recognizable because of the graffiti. We were disappointed that because of the action of one person the history behind the rock art had been lost. Ron Rood, the former Assistant State Archeologist for Utah and current Senior Staff Archeologist for JBR Environmental Consultants, said "I hope [the vandal] learned his lesson about vandalism and how through one simple, stupid act, he altered the historic record to a point that it may not be possible to restore the artwork to its original form."

Vandalism of rock art and archaeology sites is a prevalent problem. Sites are robbed by people who are treasure hunting and rock art is damaged through human recreation.



Ron Rood leads a Project Discovery discussion in Jukebox cave (photo courtesy of Tom Fritz)



What is it? To me, it is much deeper than a textbook meaning and it goes beyond a simple explanation. It is one of those things you have to feel for yourself. There is this overwhelming sense of peace that fills your soul and compels a wave of pure lucidity into your mind. You can almost feel the flow of the ancient people's spirits coinciding with your own. Archaeology is that breathe of fresh air, the magic that inspires; archaeology is the very essence that keeps the root of life alive.

Meghan Broadbent

When archeological evidence is lost and damaged it becomes extremely hard to recover and learn from the history behind it. What motivates people to disrespect archaeology is hard to determine. In the case of the vandal at Jukebox Cave, Rood suggests that it is likely that "[he] did not know any better or never had the opportunity to visit the site with an archeologist or educated person who could tell him about the art and how old it was and how important it is to protect."

In contrast to the negative effect one individual's actions can make in the case of archaeology, there is also a monumental difference that can be made by individuals to protect not only ancient history but also the world around us. These types of actions are being taken to protect the ancient history of the Great Salt Lake area. Clay Shelley, the curator at Antelope Island, illustrated some of these conservation efforts to the Project Discovery students through a tour of some island caves. Antelope Island has many archeological sites that provide evidence of the Freemont people. Efforts have been taken to ensure that the history is preserved by limiting access to those areas as well as changing construction plans to avoid these locations. Although it takes more effort to guard the history, many people realize the importance and are willing to do whatever it takes to preserve it.

The more education people receive regarding archaeology and the environment as a whole, the better able they will be to take care of it. The vandal at Jukebox cave acted out of his ignorance to the value of the rock art. This same circumstance often occurs in the case of other local treasures. Many people do not appreciate the Great Salt Lake for its value because they do not understand the significance the lake has not only for today but for past generations. The vandal learned a lesson that would insurmountably benefit all of us. We must all learn to appreciate the precious resources that abound us. If we fail to learn this important lesson, our poor choices could negatively impact these resources forever.



The student pieces above were all written by participants in the Project Discovery 2011 field school. Project Discovery was made possible by a donation from Rocky Mountain Power. The field school organizers would also like to extend their appreciation and thanks to: Utah State University - Museum of Anthropology, REI, Inc., - Salt Lake City, Rico Brands Food/Frida Bistro, Utah State History - Antiquities Section, the Andrews Family in Logan and the Colorado Plateau Archaeological Alliance.

See page 12 for more information about Project Discovery

Michelle Thurgood and KayLene Yamada

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### IMPROVING BIRD HABITAT

### Through Establishment of Engineered Wetlands Along the Jordan River

The Jordan River has gained a great deal of recognition over the last several years through the development of planning documents such as the Salt Lake Countywide Water Quality Stewardship Plan and the Blueprint Jordan River. The recent establishment of restoration working groups and the Jordan River Commission has given legs to the process of improving the entire river corridor from Utah Lake to Great Salt Lake. Other efforts to improve both water quality and habitat conditions have been ongoing for many years. Recently, these efforts have been recognized by the selection of the Jordan River as one of two areas in Utah to be included in the U.S. Department of Interior's Great Outdoors Initiative.

The use of engineered wetlands and channel reconfiguration has improved habitat conditions for a variety of migratory and resident birds that use the river corridor. Restoration of previously channelized sections to add floodplain connection benefits both humans and wildlife in various ways. Humans benefit from the ecological services of functional riparian areas through recreational activities such as bird-watching, as well as opportunities for cultural, intellectual and spiritual inspiration. Wildlife species benefit from quality habitats along the Jordan River by having food to eat, nesting areas, and space to rest during migrations. Many projects are in various stages of restoration, but overall, the acknowledgement by the public in these efforts has made a great difference.

#### Regional Context

The Jordan River is a water body that provides important connections throughout the Salt Lake Valley. The waterway connects Utah Lake to Great Salt Lake, bringing in other water sources from the mountains as it travels north. Along with this water connection, patches of riparian habitat also provide an essential link for migratory birds as they travel north or south on their yearly journeys, following the river's course. The river also connects the people of the valley not only along the trails, but in the many actions we take that have the potential to affect the waterway. Our historical actions have significantly altered the functioning of the river ecosystem and our future actions will hopefully continue to improve the functioning of that ecosystem.

In order to protect the water quality in the Jordan River (as well as the Great Salt Lake), we need to start in our own front and back yards. Not only do we flush our problems down the drain, but we also let chemicals and other contaminants such



Jordan River wetland, photo courtesy of E. McCulley





as dog feces and other organic materials drain from streets and gutters into the waterways, into the Jordan River, and eventually into Great Salt Lake.

#### History of the River

The Jordan River has long been used to provide water for human uses in the Salt Lake Valley. It has also been viewed as a place to get rid of wastes derived from those human uses. Native Americans used the valuable natural resources associated with the water and habitats along the river corridor, pioneers set up irrigation for pastures and crops, and modern communities continue to use the river for a variety of purposes.

The natural functioning of the river was significantly altered during the twentieth century as communities grew up and flood risks were mitigated by channelization along most of the length of the river. Meanders were cut off and floodplains were made into farm fields. Management of water levels in Utah Lake with the diversion at the mouth of the Jordan also changed the natural cycles of spring flooding and late summer low-flows. Reduction in numbers of native fish through overharvest and introduction of non-native species of fish and plants further altered the river ecosystem.

In recent years, projects such as the Great Salt Lake Audubon's Jordan River Migratory Bird Refuge and restoration projects implemented by Salt Lake County have improved habitat conditions in some areas of the river. Establishment of mitigation properties such as the Legacy Nature Preserve, the Mercer Bingham Junction Mitigation Wetlands, the Galena Soonkahni Mitigation Bank, and the Redwood Nature Area have protected some of the floodplains and vastly improved habitat conditions in certain areas. Municipalities have created parks and trail systems that have natural features planned into the design. Engineered wetlands and managed landscapes have become tools that humans have used to improve conditions degraded by multiple years of use and alteration.

#### Adaptive Management

Restored and reclaimed areas along the river corridor have improved water quality and habitat conditions for birds and other animals. Many of these areas are in good condition and require a minimum level of maintenance. Some areas that were previously restored have become degraded again due to lack of follow-up on restoration actions. The recently established Jordan River Working Group has been trying to gather information that is helpful in developing sustainable management methods for these open spaces. Funders have begun to see the benefits of having an adaptive management strategy in place to ensure the money spent on restoration was not wasted.

An adaptive management strategy is basically an approach to managing landscapes that involves developing goals, objectives and actions that can be tracked through monitoring conditions on the ground. The strategy that has been implemented on many Jordan River sites involves collecting data on water, vegetation and birds, fish or other animals. Numerous partners are involved in collection of data and we are just now developing a common framework to use that data to help manage the river and its associated resources.

The Future of the Jordan River

Looking to the future, the Jordan River continues to become a focus of community connection to the natural world for over a million urban dwellers and will continue to connect people and wildlife. We can take a step back and look at the broader picture of the entire Great Salt Lake Watershed and see how our actions at home affect the river and areas downstream. Please take some time to search the internet and investigate all of the activities that are happening along the river and maybe take a Saturday to help out with a cleanup or planting trees. Learn more about the river's human and natural history by purchasing a copy of Reawakened Beauty: The past, Present and Future of the Jordan River, published locally by the Center for Documentary Arts. Follow and support the recent work of the Jordan River Commission in its effort to implement the goals of the Blueprint Jordan River study. Adopt a section of the river and make it a regular family outing to clean up a section or trail or get involved with a local cleanup effort. Our collective efforts towards improving the conditions along the river have been successful and will be essential to keep improving conditions into the future.

Eric McCulley

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Chair of the Jordan River Working Group Vice-chair of Utah Linking Communities, Wetlands, and Migratory Birds

### THE OGDEN MIGRATORY BIRD PROGRAM

### A New Community-Based Conservation Effort

Members of the Friends of Great Salt Lake are well aware of the joy and enrichment that nature brings to our lives. For many of us, birds are a central focus of our enjoyment of the natural world around us. Bird watching is one of the most popular outdoor recreational activities in the United States. A passion for birds and their environment also brings us awareness of the many negative impacts to birds and the environment. Unfortunately, access to such outdoor recreational activities are not readily available for many segments of our population. For urban communities this could be due to a lack of access to outdoor activities and perhaps the economic factors that entail these outdoor activities. Limited access for some negatively affects birds and their environment, as well as our quality of life.

The Ogden Migratory Bird Program (OMBP) hopes to provide access to those who have not had an opportunity to engage with the outdoors. The OMBP is a collaborative effort to conserve birds that live or migrate through the Ogden area by implementing community based educational, outreach and conservation projects. The OMBP is funded by an Urban Conservation Treaty for Migratory Birds grant from the U.S. Fish and Wildlife Service awarded to the City of Ogden Utah and Weber State University (WSU). OUMBP works in partnership with the Wasatch Audubon Society, Ogden Nature Center, Weber State University, and the Utah Division of Wildlife Resources.

Current and planned projects include mural and art projects, schoolyard habitats, Ogden River restoration, Ogden city bird counts and a variety of community-wide initiatives. For example, in January we initiated a schoolyard habitat at Mound Fort Junior High School (MFJH). The student body at MFJH is largely Latino, a student population which traditionally has had less access to environmental activities. Latino community participation in bird watching is one-third of that of the non-Latino population. This discrepancy has many educational implications including reduced scholastic opportunities especially in the natural sciences. OMBP and WSU undergraduate students will be working with about 20 eighth and ninth grade Advancement Via Individual Determination (AVID) students for the duration of the habitat project. AVID students have college aspirations but have lacked equitable paths to higher education thus this projects provides these students a unique opportunity. This project will also enhance collaboration with WSU students and faculty so that AVID students have first-hand exposure to college opportunities and careers. The schoolyard habitat will be integrated with the school's curriculum and provide the greater student body exposure to Utah native plants and animals.

As the OMBP Outreach Coordinator I am especially excited to share my passion for birds and science with the Ogden community and surrounding region. My path to Weber State University and Ogden is winding. After I received a Ph.D. in 2007 from the University of Minnesota with a focus on evolutionary biology, I was Chapman Post-doctoral Fellow in the Department of Ornithology at the American Museum of Natural History in New York City where I used DNA to examine the impact the Isthmus of Tehuantepec in southern Mexico had in shaping the evolutionary history of montane forest birds. More recently I was a research scientist at Brigham Young University examining how historical events, such as glacial advances, helped shape the currently observed aquatic species community of Chile and Argentina.

I look forward to working with our community partners, faculty and students at Weber State University and Ogden communities. If you are interested in becoming involved with the OMBP or have an idea for a community-based project please contact me at brianbarber1@weber. edu.

#### Brian Barber

Ogden Migratory Bird Program Outreach Coordinator



Brian Barber, photo courtesy of Ryan Stuchly

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### UTAH WATERFOWL ASSOCIATION AND UTAH STATE UNIVERSITY

Join Forces To Battle Phragmites in GSL Wetlands



A controlled Phragmites burn, photo courtesy of J. Ray

On a clear, breezy day this past April, my son and I drove along a dike in the marsh. To the north of us, scattered pillars of smoke rose into the sky from fires burning sporadically across miles of wetlands. To us, it had the appearance of a World War I battlefield as opposing forces threw themselves at each other in a stalemated conflagration. In reality, we were in a battlefield and opposing forces were throwing themselves at each other in a battle that, on a good day for "our" side, is a stalemate. On the GSL, phragmites is winning inexorably acre by acre and in ways far more permanent and intractable than we initially feared. A new study will hopefully provide an understanding and approach that will turn the tide of this crusade. But everyone's support is essential to ensure its success.

What I saw in April has become a spring ritual on both publicly and privately managed marshes around the lake. The fires are the second step of the traditional attack on the advance of phragmites. The first step is to spray a phragmites stand in the fall when the herbicide will be drawn into the root/rhizome system. The subsequent fire is intended to clear away the dead stand that would otherwise clog the marsh, even in death, for years before its eventual decay. Sounds good in theory and sometimes it even works; however, the results are far from perfect, far from complete and leave marsh managers in a Sisyphean task that makes only incremental progress and requires constant attention and a lot of money to maintain recovered ground.

Privately managed marshes have been able to throw enough money and effort at the problem to make progress and reclaim lost marshes; however, it simply never ends and even a hiatus of a few years sees the limited gains disappear under an inexorably advancing 14 foot high wall of impenetrable phrag. Without a large annual expenditure all would quickly be lost.

On public marshes, the limited efforts are noble but wholly inadequate. Public managers are left like Hector at the Gates of Troy. Fighting valiantly but overwhelmed. For every acre treated, dozens are lost as the rhizomes from untreated stands weave their way through mudflats, playas and marshes. The rhizomes' advance of many yards a year is compounded by dispersal of millions of seeds from the flowing tassles that top each phragmites stalk. The shear bulk of annual phragmites growth builds a thick layer of thatch on top of the rhizome latticework in the mud that transforms a mudflat or transitional marsh into an elevated meadow. After several years of buildup, even burning won't reverse the damage. Phragmites are terraforming the bed of the lake into something entirely new and doing it on a scale so grand that it is hard to fathom.

Faced with this ever expanding and unrelenting crisis, many people, groups and governmental organizations are coming together to fund a study spearheaded by Karin Kettenring, Ph.D. at Utah State University. The multiyear study is designed to develop and evaluate a more effective approach to phragmites eradication and wetland restoration. Support of this study is critical. The status quo is failure and irretrievable loss. Simply burning stands that have existed for 10 years will not restore the bed to what it once was. We cannot afford to wait any longer, to throw money at half-measures or accept traditional methods that lack permanence.

Dr. Kettenring's study is designed to first evaluate the spread of phragmites across the lake over the past decade or so. This is followed by designing and deploying control strategies on test plots and comparing success with control sites. These strategies are based on prior research and an understanding of the biology of phragmites growth and life cycle. After testing and evaluating these options, there will also be a study designed to enhance revegetation efforts.

As significant as this study is, its funding is uncertain in this time of limited budgets and economic constraints. The support of everyone is essential. Interested individuals, which includes you, can contribute by (a) encouraging your local government to support this effort, and (b) making a donation to FOGSL designated as "Phrag Study".

Jack Ray, President of the Utah Waterfowl Association



### Understanding Ancient Lifeways of the Great Salt Lake

Project Discovery is a yearlong, hands-on outreach program designed to give young adults new opportunities to experience Utah's rich cultural and historic heritage and to share what they have learned with their local Utah communities. This outreach program, developed by Utah teachers and the Utah Department of Education, is based on existing high school curricula in social science, earth systems, biology, language and fine arts but is implemented through activity-based exercises in the field, with students gaining in-depth knowledge of how science and the humanities are integrated into the field of archaeology.

The program begins in the early summer, when high school-age students learn about, explore, document and help preserve ancient Fremont and Ute sites in southern Utah. Students from schools throughout Utah, along with their science teachers, work side-by-side with professional archaeologists, historians, and artists who guide them in their discovery of Utah's natural and cultural history. Field trips to several key archaeological sites in the Great Salt Lake area are also included. These trips help students learn about the diversity of environments and the types of natural resources available in the State of Utah. They are guided by some of the most knowledgeable Utah archaeologists who encourage them to think about how ancient humans adapted to Utah's diverse environments and how ancient peoples used resources found in these changing environments over time. Students also actively participate in identifying and documenting ancient dwellings, granaries, rock art, and other artifacts left behind by Utah's early peoples. By directly experiencing the processes, protocols and ethical demands of the archaeological profession, Project Discovery students develop a solid understanding about how and why it is important to preserve and protect Utah's unique cultural heritage for future generations.

As part of the Project Discovery learning process, students acquire considerable understanding of the archaeological profession and Utah's ancient human past. For instance, they learn that archaeologists study the material remains left behind by ancient peoples and cultures. From these material remains, they reconstruct the ways ancient people moved about the landscape, the tools they used, where they gathered, hunted and farmed, what they ate, and how they organized their communities. At archaeological sites like Danger Cave, one of the sites visited as part of the program, archaeologists have documented nearly the entire 13,000-year span of changes in these different types of human behavior in the region. Based on excavations here and nearby, they have learned that earliest Paleoindian peoples in the area forged through a land never before inhabited by humans. These Paleoindians lived mostly in small, mobile groups who relied mainly on hunting large game, including mammoth, a now extinct species of bison, elk, pronghorn, deer and bighorn sheep. Paleoindian settlements typically were in the lowlands along wetlands and now-desiccated Ice Age lakes. Unlike contemporaneous people living on the Great Plains, however, Utah's Paleoindians also appear to have also incorporated many plant foods into their diets. Beginning around 9,000 years ago, ancient lifeways changed to include even more plant foods like desert-adapted pickleweed in the diet and people began to exploit a desert environment that began to look a lot like the Great basin today. Archaeologists call this type of mobile, hunting and gathering lifeway, expertly adapted to the harsh but diverse environments of the eastern Great Basin, the Archaic. Archaic lifeways developed in concert with climatic, environmental, social and technological changes over nearly seven millennia. They developed the atl atl, a throwing board used to propel stone-tipped darts into prey like dear and pronghorn. They developed sophisticated basketry and milling stones used to gather and process wild seeds. They spread out to exploit nearly every environmental niche in Utah, from the highest mountain ridges to the driest desert playas. And they developed artistic traditions like the early geometric and representational rock art found on some of the boulders surrounding the Great Salt Lake.

But beginning just before about 2000 years ago, farmers, or at least domestic crops like maize and beans, made their way north from the Four Corners region, leading to the development of distinctive Utah Fremont lifeways. Fremont people began to build small farming hamlets along the alluvial fans at the base of the Wasatch Front, make and trade diverse forms of pottery, hunt with the bow and arrow, continue to gather wild plant foods, peck and paint large, distinctive anthropomorphic images on the rocks in Utah's canyon, and even coalesce into large villages at places like Willard Bay. This mixed foraging and farming lifeway persisted from some 1500 years, finally collapsing about 700 years ago, whether due to drought, the failure of the summer monsoon, or the migration of new groups into the area is currently not entirely clear. Nonetheless, after this time and for the ensuing 700 years, ancestors of today's Ute, Goshute, Paiute and Shoshone either moved into the area or developed their own unique and highly adapted lifeways out of preceding Fremont ones. These included hunting sheep, deer, pronghorn and rabbit and harvesting and processing wild grass seeds with a remarkable array of woven seedbeaters, collecting baskets, burden baskets, and winnowing trays. They also intensively harvested piñon nuts in the fall, when large groups of people would meet to trade, marry, and renew old social relations.

This human history culminates with the migration of Utah's Pioneers into the region, the development of modern farming, ranching and mining and, more recently, the spread of urban lifestyles within the Great Salt Lake area. By studying sites like Danger Cave, the remarkable rock art in central Utah's canyons and a range of sites from Paleoindian to historic times, Project Discovery students gain substantial perspective regarding this human and natural history and, more importantly, learn how to protect and gain new insights from Utah's diverse and remarkable archaeological sites.

Monique Pomerleau





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### 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.



Looking at the Great Salt Lake from a Shorebird Perspective

If you were a migratory shorebird in the Western Hemisphere, with a penchant for traveling through the Intermountain West region of the United States, chances are you'd have a giant circle drawn on your internal map around the Great Salt Lake in northern Utah. Known by shorebirds as one of the best places north of the equator for fine dining and roomy accommodations, it would be a major highlight on your journey every year. To a lot of people, however, this same lake appears as nothing but a vast, unproductive, and sometimes smelly, puddle of salt. You, however, know it as teeming with aquatic and terrestrial resources. That may be hard for them to believe, looking across the flat expanse, but 1.4 million shorebirds like you can't be wrong! During fall migration, biologists have counted more than 500,000 Wilson's Phalaropes on the lake at one time—that's roughly one-third (30%) of this species' global population! Approximately 250,000 American Avocets (56% of global population) and 65,000 Black-necked Stilts (37%) have likewise been recorded here. In March 1991, the Great Salt Lake was designated a Western Hemisphere Shorebird Reserve Network (WHSRN) Site of Hemispheric Importance the highest level. Just one of these species' numbers would have qualified it, let alone three! What is WHSRN? It's a voluntary, non-regulatory, strategy for conserving shorebirds and their habitats through a network of key sites across the Americas. These sites must meet certain biological and land-



American Avocets, photo courtesy of Rosalie Winard



owner-commitment criteria. To date, there are 85 sites in 13 nations.

In 2005, the WHSRN Executive Office, a program of the Manomet Center for Conservation Sciences, developed its Site Assessment Tool (SAT) to help partners assess the overall health of their site for shorebirds in a standardized way. First-time results provide a baseline "snapshot" of the site's condition, threats, and conservation actions needed. Ideally, partners repeat the exercise every few years in order to update that snapshot and, through comparison, measure changes (+/-) and progress over time. Each time partners complete a SAT, they gain a better understanding of their site from a shorebird perspective and can make more informed decisions accordingly.

In 2006, partners at Great Salt Lake were among the first to brave applying the new tool, on their own. One of the highpriority action items they identified was to create a shorebird conservation plan for the Great Salt Lake. Today, that plan is in its final stages—its content informed in large part by those Site Assessment Tool results.

Fast-forwarding 6 years, the partners are interested in carrying out a second SAT, but with more guidance. That's where I come in; managing the SAT initiative is one of my roles as WHSRN Conservation Specialist. So, this March I had the pleasure of being in Utah to conduct a two-day workshop with 16 federal and state land managers, researchers, educators, and stewards eager to think like a shorebird about the Great Salt Lake. Four had been involved in the 2006 SAT, which added invaluable continuity. Weber State University's Ogden Campus hosted our event from 1–2 March, thanks to Dr. John Cavitt, Distinguished Professor of Zoology and Director for the Office of Undergraduate Research, who generously handled all the local coordination.

The Excel-based SAT has four main worksheets; each contains a series of assessment questions with either multiplechoice answers or scores to select. During a workshop, I guide the overall process, facilitate discussions, and handle the mechanics of navigating and filling in the worksheets so that the group can focus on the questions and interact more fluidly. Often, very rich discussions and debates ensue among the partners before reaching a consensus. To me, these are just as valuable as whichever answer or score they select, perhaps even more so. Each participant has a voice that is not only heard but contributes something to the collective knowledge about the site. A unique aspect of the Great Salt Lake workshop is that this trailblazing site earned the further distinction of being one of the few to complete a second SAT. The Great Salt Lake is a rather complex site to assess as a whole, given its variety of landowners, uses, socio-economic conditions, community awareness, and ecological characteristics—all facets of the assessment. However, it is primarily that ecological diversity that makes it a top destination for 41 species of shorebirds. The lake's rocky shorelines, playas, salt marshes, and extensive mudflats offer "something for everyone," especially an abundance of delicious invertebrates. Shorebirds present in large numbers each year include Western Sandpiper, Snowy Plover, Marbled Godwit, Long-billed Dowitcher, and Red-necked Phalarope, plus the three mentioned earlier. Next time you see one at the Great Salt Lake, you'll know why!

The 400,000 acres (162,000 hectares) of freshwater wetlands that surround the Great Salt Lake account for 75% of all of Utah's wetlands! These are significant to shorebirds and the lake's ecosystem. and thankfully most are protected through the Bear River Migratory Bird Refuge managed by the U.S. Fish and Wildlife Service; a Wildlife Habitat Area managed by Bureau of Land Management; 11 Wildlife Management Areas and 3 parks all managed by the State; and several privately owned nature reserves and duck-hunting clubs. The iconic lake itself is not a protected area; rather, its lakebed is a state resource and leasable for commercial purposes, primarily extraction. The competing needs for water by industry, housing developments, agriculture, and wildlife—common to many WHSRN sites—pose an exceptional challenge here, where the source is a highly evaporative terminal basin.

A summary of the results from the workshop and 2006 comparison will be available by late April. Special thanks to all the participants for their warm welcome, enthusiasm, and dedication!

Meredith Gutowski WHSRN Conservation Specialist Manomet Center for Conservation Sciences Manomet, Massachusetts www.whsrn.org

Participants included representatives from Avian West, Inc., Ducks Unlimited, Inc., Kennecott Utah Copper, National Audubon Society, U.S. Fish and Wildlife Service, Utah State Parks, Utah Division of Wildlife Resources, Utah Linking Communities, and Weber State University Department of Zoology. Financial support of the workshop by the latter three was much appreciated!

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### DISCOVERING OUR LAKE

### Great Salt Lake Shorelands Preserve



Spring Green-Up, June 2003, photo courtesy of J. Bach

The Nature Conservancy of Utah (TNC) began acquiring land along the northeast shore of Farmington Bay in 1984 to preserve critical habitat in response to the increasing pace of residential development in Davis County. Even in the early days of acquisition, when the land was called Layton Wetlands Preserve, discussion about developing educational facilities at the Lake's edge arose from an idea that, as people knew more about the Lake, they would be more inclined to value and protect it. The idea lay dormant as the Conservancy wove together a zone of upland and wetland properties ten miles long from Kay's Creek to the Antelope Island causeway, comprising 3,500 (now 4,500) acres and exhibiting a variety of habitats and vegetation types.

In 2000, sufficient land and funding were in place to begin what would become the Great Salt Lake Shorelands Preserve Visitor Center. As design team manager for the project, I had a lot to learn, and the entire three-year process of planning, design and construction that culminated in the 2003 opening of the Preserve's facilities at 3200 West in Layton, was a wonderful collaboration of scientists, dreamers, realists, funders, artists and architects.

Among the first things I learned was that the Great Salt Lake is different. Having grown up in Minnesota, I thought I knew what lakes were – clear blue water, stable in shape and size, host to populations of fish and aquatic species, and primarily used for recreation. It took weeks of hiking the upland edges and wading the wetlands of the Preserve with Joel Peterson, TNC's Preserve manager, to begin to understand both large and subtle differences that make this Lake unique, rare and precious. When I finally understood Joel's explanation that the "stink" of the Lake doesn't signify ill-health or malaise ~ rather it means the Lake's processes of growth and decay are working as they should ~ it was a breakthrough, and the more I learned about the Lake, the more invested I became in protecting it and telling its story.

#### Planning Philosophy

The Shorelands Preserve occupies a strategic position on the shores of Great Salt Lake. Situated amid other managed wetland areas of dramatically different character, the interface of dry grasslands and wet marshes, ponds, sloughs and mudflats created by the ever-changing edge of Great Salt Lake have remained largely free from manipulation. These sites all share a common goal with the Preserve: sustaining a healthy Lake ecosystem that supports critical nesting and feeding habitat for millions of shorebirds and waterfowl.

In keeping with Aldo Leopold's caveat ~ "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise" ~ design and development of visitor facilities embraced a goal to educate target audiences about the value of the Lake's wetlands and to instill within them a long-lasting conservation ethic. Through the arrangement of unique structures, an orchestrated sequence of movement between wetland types, and a series of interpretive exhibits, the facility is designed as an intimate experience, to encourage visitors to slow down, listen, and to find an emotional connection with the land. Interpretive and educational messages are delivered in untraditional ways, blending science with art and poetry, intended to create hands-on experiences for visitors to engage their senses, intellect and emotions.



#### Demonstrating Conservation

#### Trestlewood

Buildings, boardwalk, poetry, signs and exhibits serve as a living classroom to promote awareness about the Lake's ecological treasures and its importance to Earth's migratory bird populations. They are also intended to showcase conservation methods in choices of materials and methods of installation. To reflect a conservation ethic, structures are built of recycled and environmentally friendly materials, and construction methods and scheduling were carefully managed to minimize disturbances to the land and wildlife.

Pavilion, boardwalk, interpretive nodes and tower are all constructed of salvaged Douglas fir, known as Trestlewood. Wood pilings and decking, harvested from a 12-mile long trestle across the north arm of Great Salt Lake, are long, straight and solid, and they are infused to their core with Lake salts, which has helped to preserve them since 1904. This timber was a natural choice for the primary building material. Wetlands of the Preserve have evolved in the salty history of Great Salt Lake water level fluctuations and plants tolerate the constant salt content of water and soils, permitting direct contact with the salt-pickled pilings. While in a fresh water environment this would be out of place, using Trestlewood at the Great Salt Lake Shorelands Preserve brought it back home.

#### Construction Methods and Scheduling

The Preserve is host to many migrating species, comprising millions of birds, who rely on the Lake's habitats for critical rest, food and sanctuary during their trans-hemispheric journey. Construction was carefully organized and monitored to minimize impacts on habitat quality and on both resident wildlife and migratory birds.

Understanding the timing of migration, breeding and nesting was important to avoid wildlife impacts from construction during those critical periods. Construction of the entry road and parking area occurred during the summer months, as well as materials delivery and staging for construction to occur later in the wetlands. Non-mechanized trail layout and limited construction preparations occurred in September and October, but the installation of pavilion, tower and boardwalk deep into the Preserve wetlands took place after migration was over and continued through the winter months. While winter construction is not optimal in terms of human convenience or cost, it afforded minimal impact on wildlife and soil compaction, and allowed the swiftest recovery of vegetation with the end of dormancy the following spring.

#### Summary

Jacques-Yves Cousteau's famous statement, "People protect what they love" and its corollary that people love only what they know, capture the philosophical underpinning of most environmental education efforts. Though Great Salt Lake represents a significant influence in our historical, environmental and cultural life, it is little understood, seriously underappreciated, and will be protected only when we understand its intrinsic worth. My own experience substantiates the truth of the philosophy. Having the opportunity to trek the length and breadth of Preserve lands and discover its history, ecology and power, I came to know the Lake, grew to love it and joined the ranks of people dedicated to protecting her.

Jim Bach, Landscape Architect



Regrowth by Fall, October 2003, photo courtesy of J. Bach



## FRIENDS of Great Salt Lake

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Lake Fact: How much is the total economic output from Great Salt Lake recreation, mineral industry and aquaculture to the State of Utah's GDP?

Answer: \$ L3 billion/yr

Submission Deadlines: Sept. 16 (Fall), Dec. 16 (Winter), Mar. 16 (Spring), June 16 (Summer). Submit articles and images for consideration to Lynn de Freitas, ldefreitas@earthlink.net, or call 801-583-5593

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