



FRIENDS OF GREAT SALT LAKE

P.O. Box 2655, Salt Lake City, Utah 84110
FOGSL@xmission.com
Volume 5 Number 3

(801) 582-1496

Spring 1999



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.

Table of Contents

President's Message	3
Great Salt Lake Bird Festival	4
Brine Shrimp Companies and the Brine Shrimp Resource	6
Development of a Visual Representation of the Dynamic Nature of Great Salt Lake	8
The Nature Conservancy of Utah's Youth Education Program	9
How Many Arms Does This Lake Have Anyway?	10
Wetlands Ecosystem Education Plan	12
Great Salt Lake Planning Project Update	12
<i>Artemia</i> in the West Desert	13
Directory	14
Thanks to Donors	15
Membership Application	16

An Education Master Plan for the Greater Great Salt Lake Ecosystem to be discussed at our next General Meeting

An Education Master Plan for the Greater Great Salt Lake Ecosystem will be presented by the Northern Utah Wetlands Partnership on Tuesday April 27, 1999, beginning at 7 P.M. at the Sugarhouse Garden Center. Come to the April 27 meeting to hear about and provide initial input into the education master plan for the Greater Great Salt Lake Ecosystem. This master plan will develop educational themes and messages to be used in wetland education activities and programs. Implementation of the master plan will begin after the plan is completed in May 2000. The major responsibility for developing this master plan comes from the Utah State University Wetlands Education Team. Support is provided by the Utah Reclamation Mitigation and Conservation Commission, the Utah Division of Wildlife Resources, and many other entities. See article on page 12.

Spring 1999 Calender of Events

April 24, Saturday	Field Trip to Kennecott's Inland Sea Shorebird Reserve, 8:30a.m.-noon, see pg. 15
April 27, Tuesday	General Meeting 7 p.m. Education Plan for the Greater Great Salt Lake Ecosystem
May 6, Thursday	Board Meeting 7 p.m.
May 8, Saturday	Great Salt Lake Bird Festival, "The Lake Affect" showing at noon at the Davis Co. Fairpark, see pg. 4
May 15, Saturday	Adopt-a-Highway Cleanup, 9 a.m.-noon, meet at Saltair Exit on I-80, see pg.15
May 25, Tuesday	General Meeting 7 p.m. Recent Archeological Finds on Antelope Island
June 3, Thursday	Board Meeting 7 p.m.
June 5-6, Sat. and Sun.	Auto Tour of the West Desert and Archeological Field Trip
June 22, Tuesday	General Meeting 7 p.m. Topic to be announced

NOTE: General Meetings are held at the Sugarhouse Garden Center, located in the northeast corner of Sugarhouse Park, 2100 S. 1300 E. in Salt Lake City. Board meetings are held at the Salt Lake County complex on State Street and 2100 South in Salt Lake City, room S3009.

Cover: Brine shrimp by John P. George from *Seductive Beauty of Great Salt Lake: Images of a Lake Unknown*
Essays by Ella Sorensen and Photographs by John P. George, Published by Gibbs Smith, 1997



President's Message

We celebrate the onset of spring with a cover photograph by John P. George. It is from the book, *Seductive Beauty of Great Salt Lake*. In John's inimitable style, we behold the darling of Great Salt Lake, *Artemia franciscana*, the brine shrimp species we call our own. This little critter is the bellwether of the ecosystem's well being and the hinge of seasonal cycles for the Lake. It is also the focus of the comments we recently completed on the draft of Management Alternatives for the Lake, another phase in the Great Salt Lake Planning Project.

Working through the resource alternatives for the Lake, we experienced frustration and disappointment in the process because it was inadequate. The State neglected to provide a constitution or context for managing the Lake and its resources. Without that framework to hang management alternatives on, we felt that decisions over addressing the resource issues were isolated. We know what our vision for the Lake is, but we also wanted a vision from the State. We needed to know how the State sees the Lake's ecosystem 200 years from now. Is the goal to manage for the optimal biological productivity of the Lake or merely for its economic returns? The Lake needs a champion that is willing to provide clarity, perspective and assurance that it will be managed for long term sustainability. The limiting factor in that scheme is the *Artemia franciscana*.

As the planning process continues, so does the migration of our avian visitors. According to Ella Sorensen's account of the succession of arrivals to Great Salt Lake, the yellow headed blackbirds should be here by now, along with the first of the eventual hundreds of thousands of American avocets, among others, who grace the shores of the Lake. Time to visit the Lake and recognize the Great Salt Lake ecosystem as one of the most important wildlife habitats on this hemisphere. With that in mind, the first Great Salt Lake Bird Festival is planned for this May 7,8 and 9. This three day event will provide ample opportunity for all of us to remember the significance of place. There's more about this in this issue.

Significance of place is also the reason for a visit by Dr. Kimiko Kozawa, a respected environmental specialist and professor at Gakugei University in Tokyo. Dr. Kozawa is scheduled to visit Salt Lake City at the end of March with a group of her colleagues. They are interested in environmental issues and programs in the West. They're also interested in grassroots organizations working on behalf of the environment. In a special program at the Salt Lake City Library, Friends and CACC will have an opportunity to share their messages on behalf of the environment. Friends will also host our first international presentation of "The Lake Affect." We are pleased to be able to provide a focus on the Lake during their visit.

On behalf of our Great Salt Lake and its myriad occupants, enjoy this time of renewal.

Lynn de Freitas

P.S. My apologies to Todd Houggard, Fox 13, for calling him Tom in our Winter Issue. It must have been the moon.



Great Salt Lake Bird Festival

May 7-9, 1999

The Great Salt Lake Bird Festival is an event facilitated by Davis County Tourism in conjunction with:

- Antelope Island State Park
- Great Salt Lake and Wasatch Audubon Societies
- Bear River Bird Refuge
- Davis County Arts and Humanities Council
- Davis School District
- Division of Travel Development
- Utah Division of Wildlife Resources
- Farmington Bay Wildlife Management Area
- U.S. Forest Service
- Friends of Antelope Island
- Friends of Bear River Refuge
- Friends of Great Salt Lake
- Kennecott Utah Copper Corp.
- Layton Hills Mall
- North Davis Chamber
- Ogden/Weber CVB
- South Davis Chamber
- The Nature Conservancy of Utah, and
- Utah State University.

The mission statement of the festival is: "To increase awareness and conservation of the Great Salt Lake ecosystem through education and nature tourism." Its goals include:

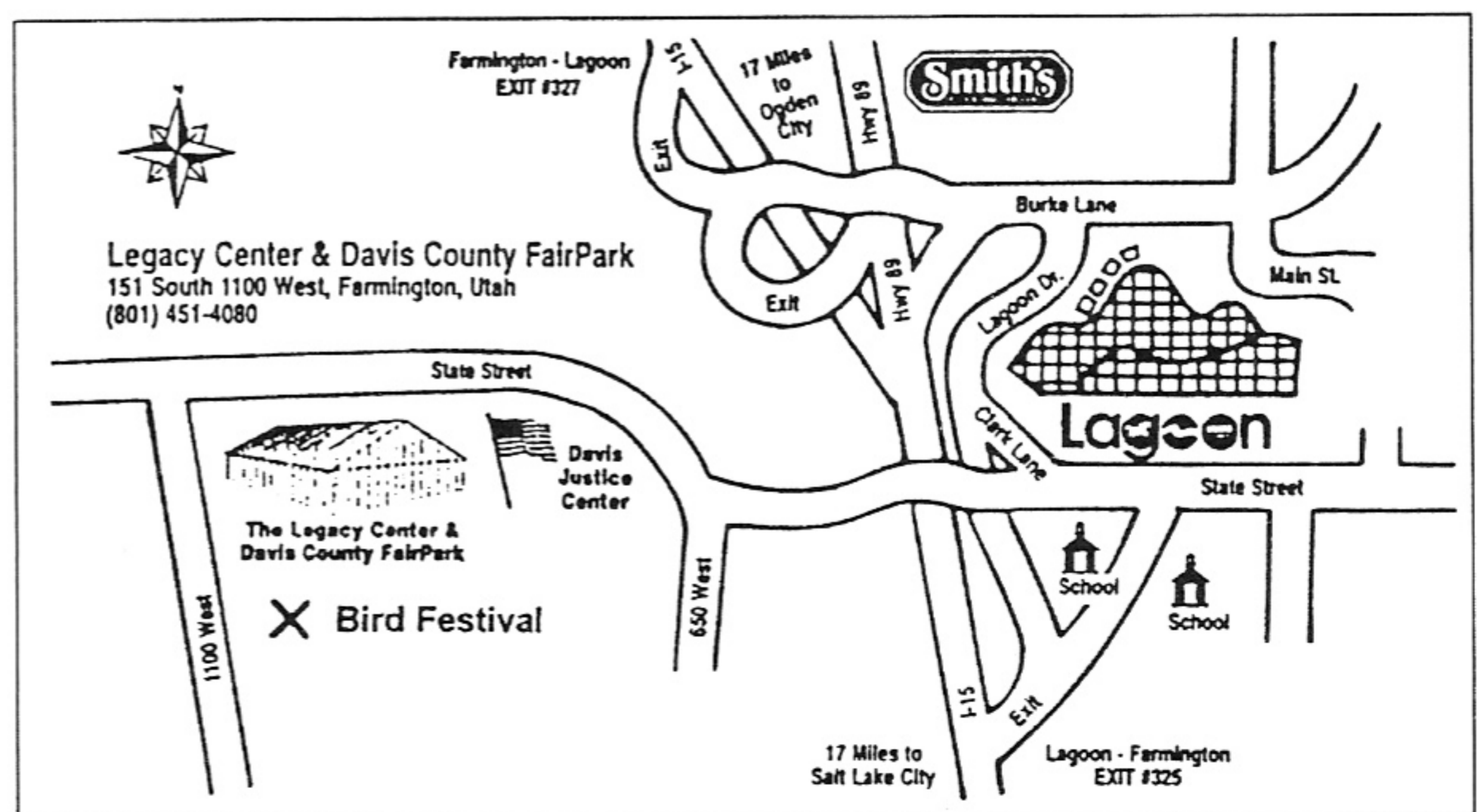
1. Increase public awareness and pride for birds found on and near the Great Salt Lake.
2. Increase the economic contribution of tourism to Davis County and surrounding communities.
3. Educate the public to the values of the Great Salt Lake; birds, ecosystem, brine flies, and brine shrimp.
4. Initiate a project to give back to the community.
5. Coordinate agency efforts concerning awareness of the Great Salt Lake ecosystem

As part of the Pacific flyway corridor, the Great Salt Lake offers a major stopping ground for millions migratory and nesting water birds annually. The significance of this unique natural resource is reflected in its designation in 1991 as one of only fifteen reserves in the Western

Hemisphere Shorebird Reserve Network. As one of the best birding spots in the West, the Great Salt Lake draws hundreds of thousands of visitors to its refuges and state parks with the primary purpose of viewing wildlife.

This festival is intended to increase public awareness and pride for birds and their habitats found on and near the Great Salt Lake by spotlighting species, offering seminars/speakers, family activities, and offering special tours of places such as Antelope Island State Park, The Nature Conservancy's Layton Wetlands Preserve, Farmington Bay Wildlife Management Area, Bear River Refuge, and Kennecott's Inland Sea Shorebird Reserve. School children will be involved with banners and field trips. Many activities will be held at the Davis County FairPark in Farmington. The partners involved in this festival are hoping to create a truly unique event for people of all ages to enjoy.

For a registration packet including activity schedule, fees, maps and lodging information contact: **Neka Roundy, Davis County Tourism, P.O. Box 618, Farmington, UT 84025, 801-451-3286, fax 801-451-2381, e-mail tour@co.davis.ut.us**





Notice to All Bird Lovers:

The Great Salt Lake Bird Festival

May 7th, 8th & 9th, 1999

If you have an interest in birds, or think you might like to become interested, **this FESTIVAL is for YOU.** There will be something there for birders of all ages and abilities:

MUSIC & ENTERTAINMENT

SEMINARS - 4 TRACKS TO CHOOSE FROM

FIELD TRIPS - CATCH UP TO 3 OF 6 DIFFERENT

VENDORS - DELICIOUS FOOD, BIRDING MATERIALS AND EQUIPMENT

A truly unique opportunity to experience the importance and diversity of the Great Salt Lake ecosystem. Find out why this is one of only 15 reserves in the Western Hemisphere Shorebird Reserve Network. Whether this is your first experience with bird watching or you have been enjoying it for years, you will find this to be a great experience.

Most activities will take place at or start from the Davis County FairPark at 151 South 1100 West, Farmington, Utah. Sign up soon, space is limited on some activities

For a registration packet including activity schedule, fees, maps and lodging information contact:

**Davis County Tourism
P.O. Box 618
Farmington, Utah 84025
801-451-3286, fax 801-451-3281, e-mail tour@co.davis.ut.us**

Hosted By:

Davis County Tourism - Antelope Island State Park - Great Salt Lake & Wasatch Audubon Societies - Layton Hills Mall
Bear River Bird Refuge - Davis County Arts and Humanities Council - Davis County Schools - U.S. Forest Service
Utah Division of Travel Development - Division of Wildlife Resources - Utah State University
Farmington Bay Wildlife Management Area - North Davis Chamber of Commerce
Ogden Weber Chamber of Commerce - South Davis Chamber of Commerce
Friends of the Great Salt Lake - Friends of Antelope Island
The Nature Conservancy of Utah

Brine Shrimp Companies and the Brine Shrimp Resource

By Jim Strong

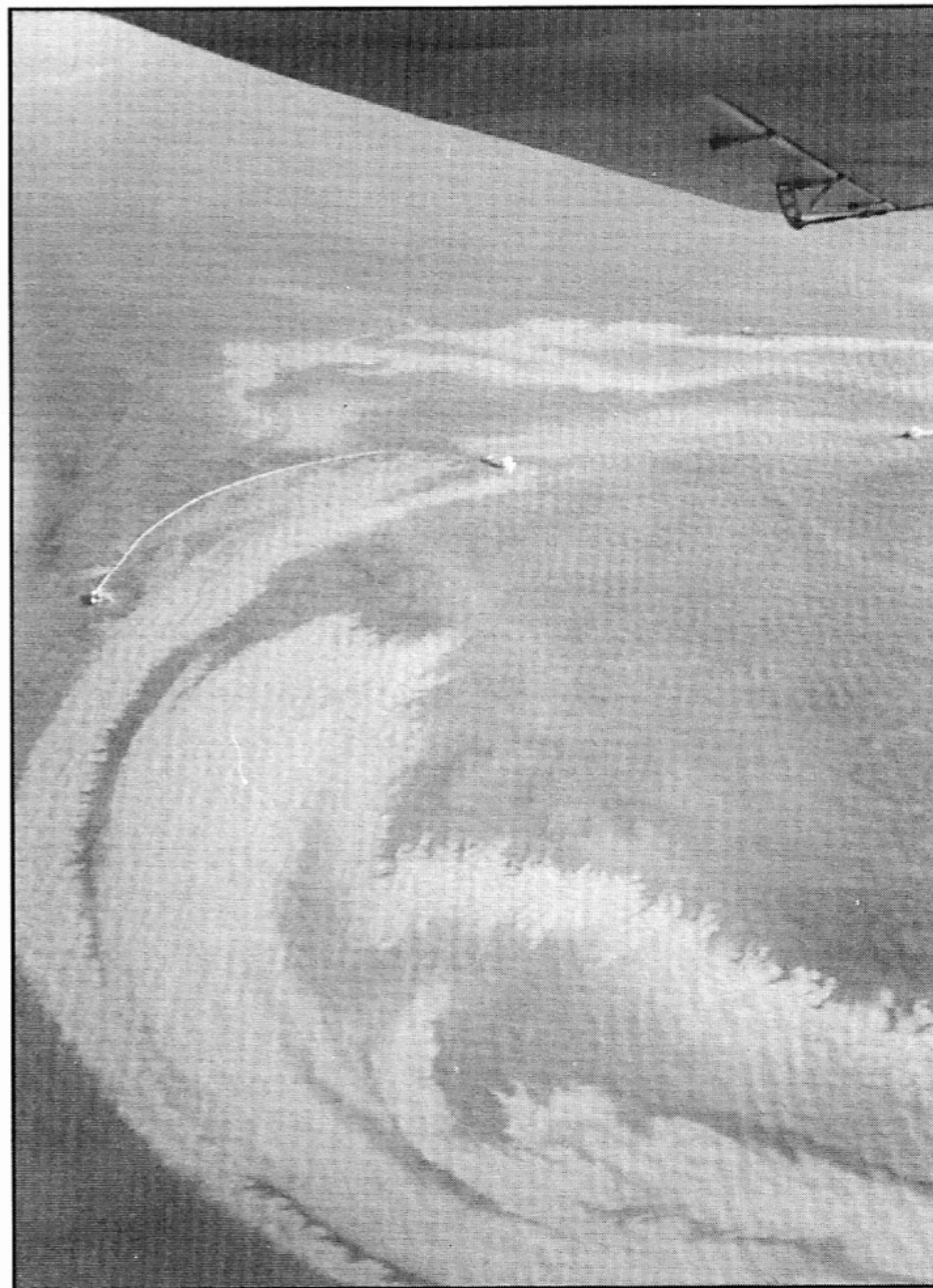
Brine Shrimp Companies do not harvest brine shrimp. They harvest brine shrimp eggs (cysts) which are processed and sold all over the world to hatcheries of larval shrimp. Hatcheries begin the cycle of growing commercially edible shrimp by taking eggs from parent shrimp and hatching them. They feed algae to these larvae for the first four days, then begin hatching brine shrimp which they continue to feed for about eight to ten days or until the larval shrimp are large enough to begin eating commercial feeds.

Biologists first learned in the 1930-40's that brine shrimp eggs could be hatched and used as food for the culture of larval organisms. They also discovered that these tiny, newly hatched brine shrimp made an excellent food for newly hatched fish and shrimp larvae. The brine shrimp is a highly nutritious food for these larval shrimp which are commercially grown out to the proper size, then sold to markets which in turn sell them as delicious food which one day might grace your table. The initial sources of commercial cysts (eggs) came from a coastal salt work in the San Francisco Bay (California) in the 1950s and later from the inland Great Salt Lake in Utah.

Brine shrimp provide a source of food for countless numbers of waterfowl who use the Great Salt Lake as a stopover in their migrations. Additionally, many aquatic birds eat brine shrimp and some shore birds also eat brine shrimp. There is no direct competition between brine shrimp companies and birds; companies seek the eggs while birds seek the actual brine shrimp. This suggests that both birds and companies can live by the brine shrimp. No one knows how many brine shrimp the birds eat but most of that consumption occurs after the shrimp has laid the majority of its eggs in the late, late fall. The shrimp all die during the winter and a new population is produced when eggs that have been in the lake all winter hatch in the spring.

Brine Shrimp Companies, more than anyone else, would not want the resource damaged or depleted. They want and need it well managed. Companies and their workers derive their living from the brine shrimp and to see it ruined or exploited would amount to failure and closure of their companies. In 1996 brine shrimp companies were the ones who asked the Utah Division of Wildlife Resources for a moratorium on the

number of certificates of registration (licenses to harvest) and the limiting of the number of harvesting companies. We asked that during this moratorium studies be initiated to determine the amount of cysts or eggs in the lake and to determine how much can be harvested in order for the next year's population to sustain both waterfowl and brine shrimp companies.



View from the air showing booms encircling dense concentrations of brine shrimp eggs on the Lake's surface. Photo by Rob Bero.

I am personally not worried that the brine shrimp could be over harvested. I went to Brazil and saw salt evaporation ponds in the Rio Grande de Norte area, Macau, Brazil where there had been no brine shrimp. In the Macau salinas, where water came from a mangrove area, 250 grams (slightly more than 1/2 pound) of San Francisco Bay brine shrimp eggs (cysts) were introduced. The population spread over a vast area of several thousand hectares (hectare is about 2.4 acres) and within one year over 15 metric tons of cyst were



harvested. For years the amount of harvest exceeded 30 metric tons of cysts per year. I talked to the biologist at the Macau Salt Co. facility and asked why they were not still harvesting the cysts? There was no harvest at all; the rule there was that salt was king (Brazil is the worlds 4th largest producer of salt). When the price is right you made money by selling salt, not brine shrimp cysts. When salt sells well the only use they have for brine shrimp is to eat the algae in the ponds.

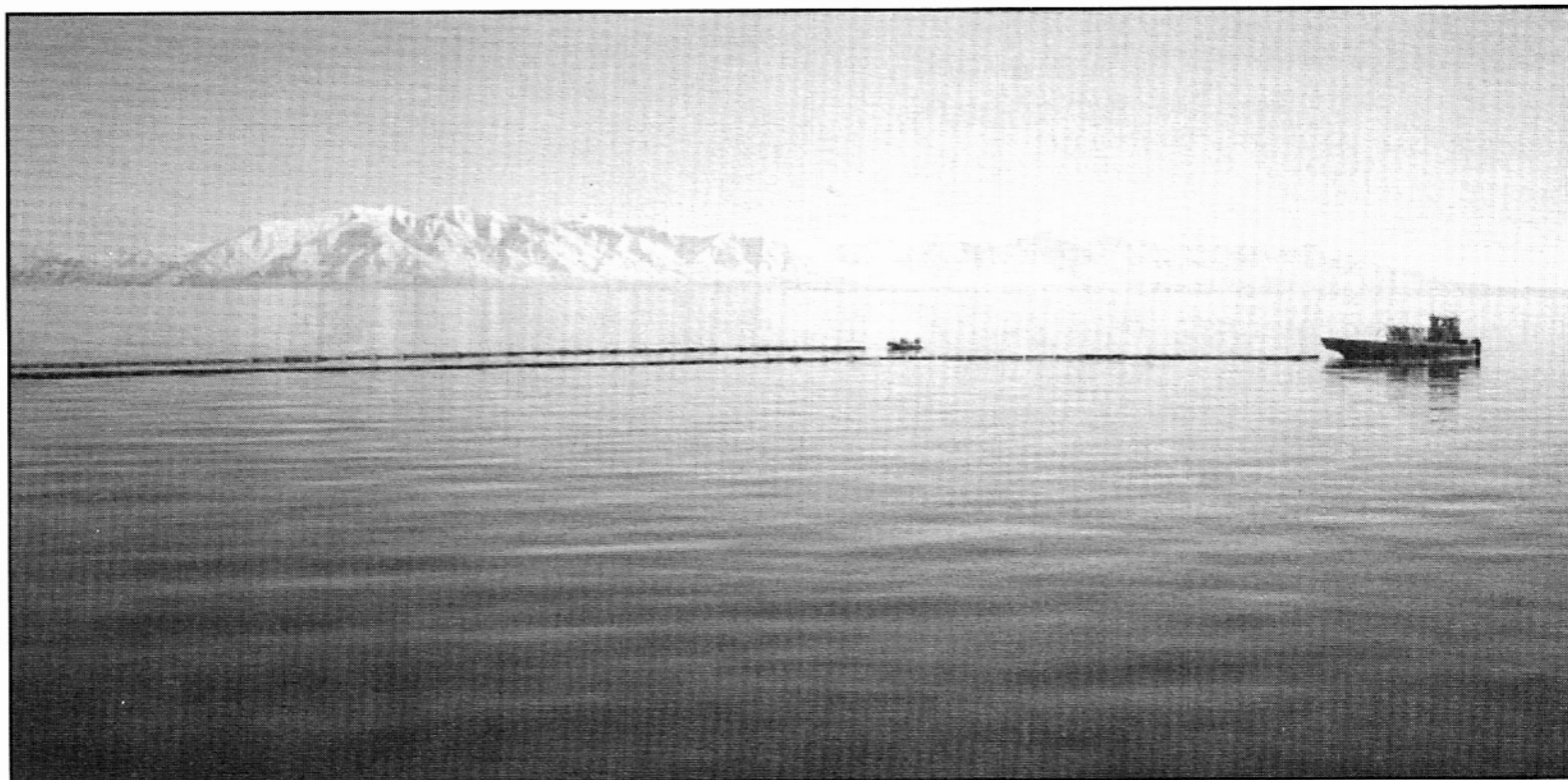
Brine Shrimp Companies, in terms of money, make a meaningful contribution to the state. One certificate of registration to harvest eggs costs ten thousand dollars and the companies collectively pay seven hundred ninety thousand dollars (\$790,000.00) to the DWR. Now a royalty on harvested eggs has been added and brings additional thousands of dollars to the state. Each company's financial contributions to the state also includes other taxes and benefits. If you consider all that it takes to operate a company the value to the state in taxes from goods purchased, payroll, registrations, etc., is in the millions. Each company has had to purchase boats, motors, radar, etc., and these items must be kept in repair. Each company has one or two pilots with planes to spot the eggs. There are workers who harvest by working on the boats and some who work on the shore. They need trailers to live in. Companies need gas, diesel, oil and lubricants, boat motors, large forklifts and trucks with which to haul boats which must have trailers. Trucks must haul hoses, motors, tools, batteries, generators, boom, water tanks, food, etc.

The processing part of the business must also have workers for cleaning, storing, canning, packaging,

shipping etc. Needed are dryers, cleaning equipment, canning machines, storage space for both cans and the cysts themselves. The office must have workers to send letters, invoices, faxes, pay bills, collect money, keep accounts, etc. Salaries and wages are paid to the workers who in turn buy cars, gas, houses, clothes, food, etc. Brine shrimp companies buy all kinds of products that help many local businesses. By way of comparison, consider that during the harvest, brine shrimp companies total work force approaches a thousand workers.

There is no one way to harvest cysts nor one way to process them. Companies have spent hundreds of thousands of dollars trying to get the best method to insure the quality of the product they produce. They are always trying new methods to better their product. Regardless of advanced processing technology, what the lake needs is to have the railroad causeway breached so there is a greater balance in salinity between the north arm (Gunnison Bay) and the south arm (Gilbert Bay). Right now the north arm is a salty Dead Sea where no brine shrimp can live, birds cannot feed, and no sailboats are seen. If it were once again like the south arm, it would almost double the lake area for waterfowl, recreation, and industry.

Jim Strong is General Manager of Prime Artemia Inc. located in Midvale, UT and has been harvesting brine shrimp since the 1987-88 season. He has a long history as a river boatman and is a founding member and supporter of Friends of Great Salt Lake. He can be reached at 801-978-9337.



Collecting the brine shrimp eggs on Great Salt Lake with boats and booms. Photo by Rob Bero.

Development of a Visual Representation of the Dynamic Nature of Great Salt Lake

Great Salt Lake is a dynamic water body supporting millions of birds and other wildlife. Since the 1960s, the lake has experienced water level elevations as low as 4191 and as high as 4212 feet above sea level. The Utah Reclamation Mitigation and Conservation Commission (Commission) is funding development of a visual representation of the dynamic nature of Great Salt Lake. The project will provide information needed to make well-informed planning decisions, and may help increase general awareness of the lake's function, value and influence on wildlife.

A water level elevation of 4217 has been identified as the upper extent of the flood plain of Great Salt Lake. At this elevation, the lake has some opportunity to fluctuate and damage to human development is minimized. However, decision makers have allowed roads, buildings and other developments within this flood plain. Decisions are being made daily as to what types of activities will be allowed within and along the shores of Great Salt Lake. Each of these decisions has an affect on Great Salt Lake, and on the people and communities adjacent to the lake. Some decisions restrict the movement of this dynamic water body, and others place human developments at risk from high lake levels. Often times, decision makers have only a memory or a "snapshot in time" image of the lake on which to base their decision.

The Commission contracted with the University of Utah's Department of Geography to acquire existing satellite imagery from 1972 to present. These images will be used to develop a series of Geographic Information System (GIS) coverages showing the dynamic lake elevation, freshwater marshes, and human development, particularly along the east shore of Great Salt Lake. Other data being assembled and collected by State and Federal agencies will be combined with these coverages. Based on this information, media tools will be developed that will show how the pattern of freshwater marshes changes as the lake level fluctuates. The project will also examine how human-induced changes and restriction of the lake affects the dynamic nature of this living system and increases the potential for property damage and conflict between wildlife and human development.

The computer-based information assembled through this project has many uses. The Commission will use this information to:

- 1) provide a dynamic base map of Great Salt Lake that will aid the Commission in developing priorities for land acquisition and planning projects,
- 2) help identify implementation tasks for its Box Elder and Davis Counties' wetlands planning efforts, and
- 3) provide an educational tool to complement the Wetland Ecosystem Education Plan (a plan for providing integrated information about the wetlands ecosystem that extends from Cache Valley, down the Bear River, along the shore of Great Salt Lake, up the Jordan River, through Utah Lake and up the Provo River to Jordanelle Reservoir).

So that other decision-makers can benefit from this information, the Commission's project provides for the development and formatting of computer-generated information that can easily be put into CD's, video and hard copy. Examples of how this information may be used by state and federal agencies, communities, planners, educators and the general public include:

- 1) the assessment of lake level effect and impact in support of DNR's Great Salt Lake Planning Project;
- 2) the development of planning, management and educational tools that can be used by countless sources to help people understand the seasonal and annual fluctuations of Great Salt Lake;
- 3) the assessment of how decisions that allow land uses within and along its shoreline, may affect the lake, its freshwater wetlands, and the wildlife resources dependent upon the lake and its diversity of habitat; and
- 4) the economic assessment of land use decisions.

The project is in its early stages and the Mitigation Commission is still developing ideas for using this information and identifying potential partners for further development and application. If you would like more information, contact **John Rice at the Commission, 524-3146.**



The Nature Conservancy of Utah's Youth Education Program

Well-trained, enthusiastic volunteers from The Nature Conservancy of Utah are now sharing our conservation message with Utah's third and fourth grade students. Coordinated with the state science core curriculum goals, the Youth Education Program is designed to teach children about the value of wetlands, especially the Conservancy's Layton Wetland Preserve located near Utah's largest human population centers. Each presentation includes a slide show of wetland plants and animals, a "touch kit" with items from a wetland, and an interactive game, the Web of Life, which helps participants realize the vital connections between wetland ecosystem members.

The premiere presentation was given in March, 1998 and, in just two months, 30 in-class presentations were given to almost 900 students! Children and teachers are excited by the program and eager to learn more. Some have visited the Layton Wetland Preserve for a firsthand look at a wetland. With their Nature Conservancy guide they learn about the secrets of this fascinating ecosystem. Pickleweed, for example, one of the world's most salt tolerant plants, is able to isolate salt, normally toxic to plants, within intracellular membranes. The snowy plover, a resident shorebird, hardly bothers with nest building. It lays its eggs in a simple scraped depression, right on the ground! There's much yet to be discovered. Maybe one of these students will become a biological sleuth.

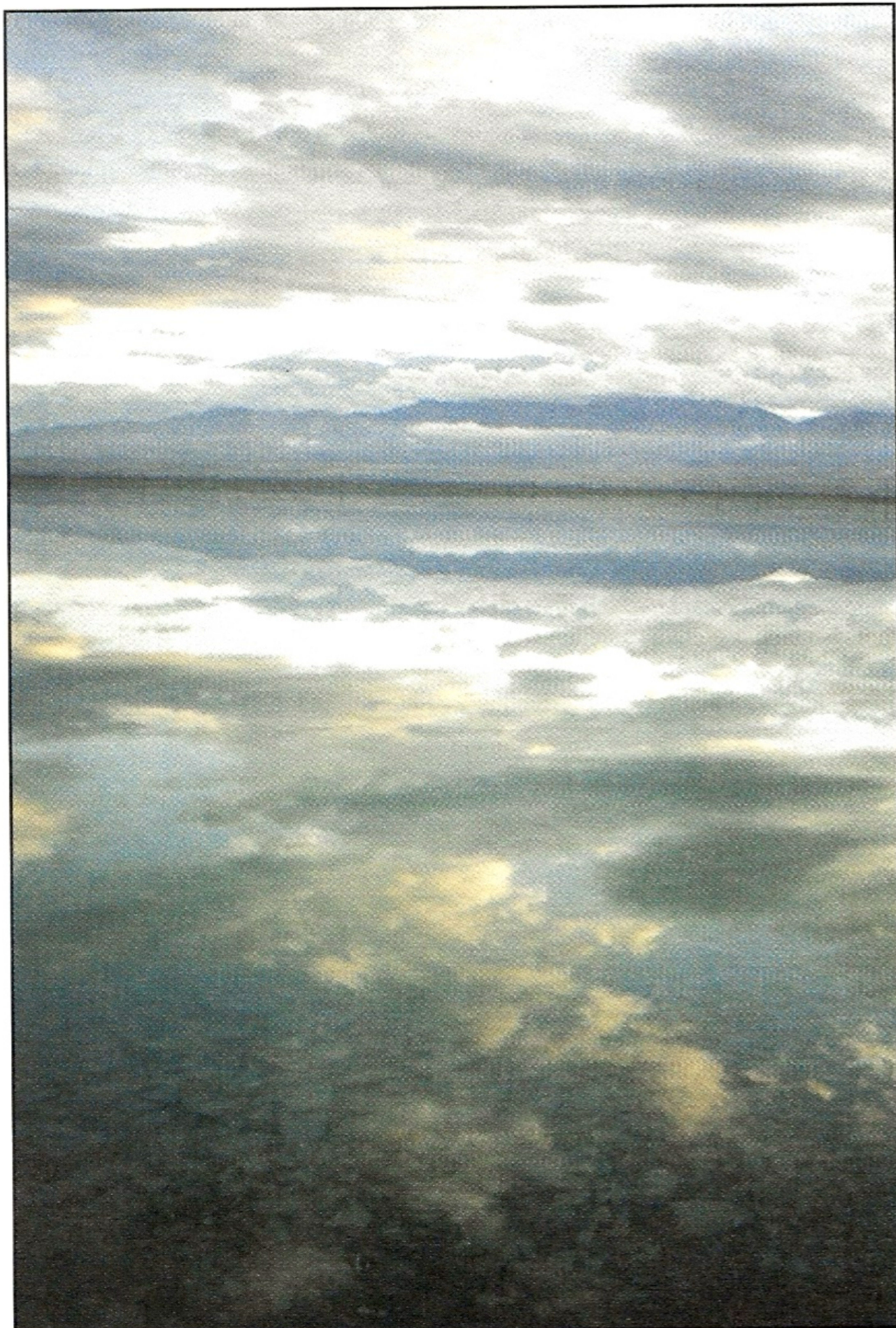


Photo by Rob Bero

The success of the Youth Education Program can be attributed to many. Volunteers Georgene Bond, Barbara Cook, Jean Williams, Eric Vozick, Jill Gruenberg, Michele Straube, Merri Napper, Tevy Vetter, Kathy English, Toni Wall, and Leslie Ansel have helped with brainstorming, curriculum development, and class presentations. We've had generous financial support from three foundations: the R. Harold Burton Foundation, the Anderson Foundation, and the Eskuche Foundation. And, finally, The Nature Conservancy of Washington provided an invaluable model of conservation education at its best with great moral and technical support in our development stages.

If you have questions about the Youth Education Program please contact **Elaine York Barton** at (801) 531-0999 ext. 20 or by email (elaineyork@aol.com).



How Many Arms Does This Lake Have Anyway?

Another in a continuing series on Great Salt Lake information compiled by Bruce Thompson, Education Director for Friends of Great Salt Lake.

In our last issue (Winter, volume 5, number 2), we presented "Physical Features," the second in our "What About This Great Salt Lake" series. That installment contained a bounty of information regarding many of our Lake's impressive attributes. It also prompted a few comments and inquiries specific to the Lake features. Herein, we attempt to clarify and supplement the earlier information about currently accepted names for Great Salt Lake's principle regions, Lake salinity, and water level impacts from consumptive use.

Geographic Names

Prior to construction of dikes, causeways and mineral extraction facilities in Great Salt Lake (GSL), lake brines were believed to have been similar in composition and concentration throughout the Lake. Since the early 1900's, dikes and causeways have been constructed for a variety of purposes. Several of these have had the effect of inhibiting movement of Lake brines. Coupled with the fact that most freshwater inflow occurs along the eastern shores, distinct salinity conditions have developed in four main areas. From freshest to most saline, they are: Bear River Bay, Farmington Bay, Gilbert Bay (sometimes loosely referred to as the "South Arm"), and Gunnison Bay (or the "North Arm").

Gunnison Bay (the "North Arm") and Bear River Bay are separated from one another by the peninsula dominated by the Promontory Mountains. More importantly, each is separated from the main body of GSL (Gilbert Bay) by Union Pacific's northern railroad causeway, which is a sand, gravel and rockfill causeway across the mid-portion of the Lake. Upon completion of this causeway in 1959, the previous main body of GSL was critically divided. Even with the engineered permeability of the causeway and the incorporation of two 15 foot-wide by 20 feet-deep culverts, brine mixing between the north and south sides was greatly diminished.

Farmington Bay was part of the Lake's main body until it was isolated by the construction of two earthen causeways. The first

of its two causeways was built in 1952 from the south end of Antelope Island southeastward to the mainland. This structure channeled the full flow of the Jordan River into Farmington Bay. The Davis County causeway, initially constructed in 1969, creates the northern confinement to Farmington Bay and extends from Antelope Island's north end eastward to the mainland. With but one bridged opening and another narrow culvert in this causeway, mixing between Gilbert and Farmington Bays remains severely restricted. Only when the Lake's elevation rises above 4,208 feet are the waters of these two bays free to mix.

Lake Salinity

Any attempt to specify an average GSL salinity is confounded both by Lake fluctuation and salt distribution variables and is thus of limited usefulness. With water variously entering from precipitation, streams, and springs throughout the Lake, GSL has long been a dynamic mosaic of saline conditions and resulting habitat. Today, thanks to flow restrictions introduced by causeway development, each of the Lake's four geographic areas themselves possesses distinct levels of water and salinization.

Bear River Bay and Farmington Bay possess similar but distinct salinities usually ranging between 3 and 6%, with the former generally somewhat fresher than the latter. **BEAR RIVER BAY** is isolated from the main body of Great Salt Lake by the segment of the Union Pacific northern railroad causeway that stretches from Little Mountain on the eastern shore, west to Promontory Point. This section of the causeway contains a midpoint bridged opening that permits a limited degree of "bi-directional flow," wherein some exchange occurs between lighter, fresher brines of Bear River Bay and denser brines from the Lake's main body.

FARMINGTON BAY is similarly prevented from becoming completely fresh because of limited "bi-directional flow" through the Davis County causeway's bridged opening. Except under rare circumstances where Lake level exceeds 4,206 feet, the salinity of Farmington Bay tends to exist at approximately half that of Gilbert Bay.



GILBERT BAY, the southern main body of Great Salt Lake, has fluctuated in salinity from a high of approximately 21% in 1966 to a low of approximately 5% in 1986. This section of the Lake receives the bulk of freshwater inflow, including that from the Jordan, Weber, and Bear Rivers. Salt content is currently 11-12%, in a downward trend from nearly 15% in 1995. Whereas Gilbert Bay had earlier been density-stratified into two vertical brine layers, its brines have been thoroughly mixed from top to bottom since 1991. This change has been attributed to diminished north-to-south return flow through the Union Pacific northern railroad causeway.

The "North Arm" of Great Salt Lake, **GUNNISON BAY**, receives very small amounts of fresh water inflow and consequently possesses consistently high salinity. Since 1966, salt concentration has ranged from approximately 14.5% (1987) to approximately 28.4%. Salt content since the late 80's has remained fairly constant at 27-28%.

Recent Salinity in Great Salt Lake's Four Principle Sectors

LAKE REGION	RECENT RANGE
Bear River Bay	3-6%
Farmington Bay	3-6%
Gilbert Bay	11-12%
Gunnison Bay	27-28% (near saturation)

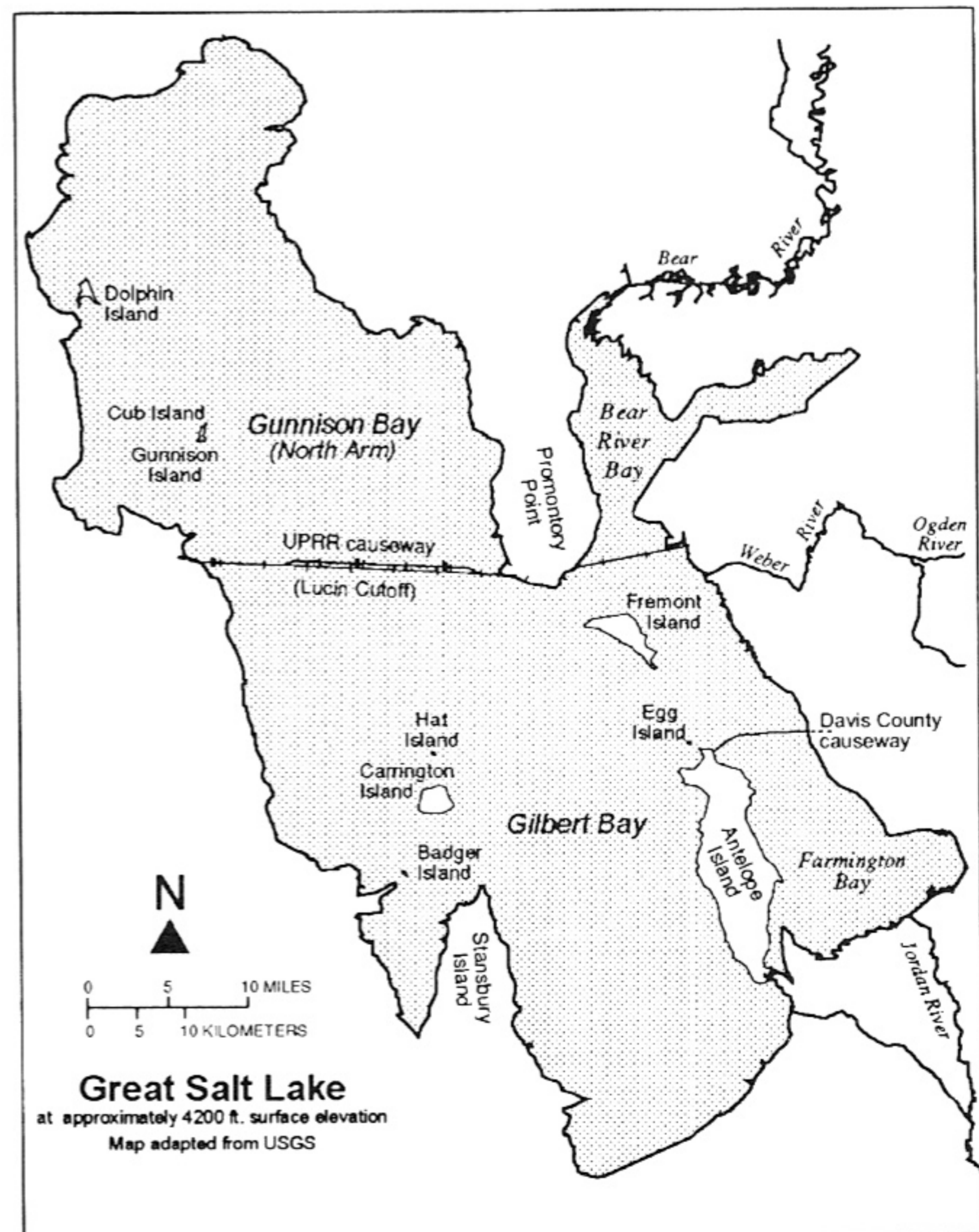
Impacts of Consumptive Use on Water Levels of Great Salt Lake

A few studies during the past few decades have attempted to assess the effects of human use and development of water with respect to Lake volume. Expressing these impacts in terms of resulting lake level is troublesome, because as Lake size changes, its resulting salinity and surface area affect a given volume of water differently in terms of evaporation rate and actual depth.

According to The Great Salt Lake Planning Project's Statement of Current Conditions and Trends (October, 1998, pg. 16), long-term, ongoing increases in water diversions will indeed produce long-term changes in Lake level. This document refers to studies that generally indicate that for each additional 100,000

acre-feet of consumptive use, the average level of the Lake would be approximately one foot lower. Conversely, an average increase of 100,000 acre-feet per year would raise the average Lake level by one foot.

Currently, between 95,000 and 180,000 acre-feet of Lake water is diverted for mineral extraction. Under existing approved rights, an additional 627,000 to 712,000 acre-feet per year could be diverted from Great Salt Lake and consumed by evaporation. While the possibility that all water diversions approved under existing applications will actually be diverted and consumed is very remote, it is expected that existing mineral extraction operations will seek to expand their evaporation ponds and brine diversions. It is further expected that depletions to the inflow of Great Salt Lake from historical sources will continue through water development on tributaries to the Lake and other human-caused water uses. Large, new water development projects on the Bear River are expected and could further add to flow depletions.



Bruce can be reached by phone at 801-467-3240 or by e-mail at <bruceslc@aol.com> .

Wetlands Ecosystem Education Plan

In June of 1998, the Division of Wildlife Resources Teamed up with the Utah Reclamation Mitigation and Conservation Commission to lead the development of a plan to create an education master plan for the Greater Great Salt Lake ecosystem.

The Reclamation Commission has committed up to \$200,000 for this effort to be matched with funds provided by other agencies and other private sources such as the Utah Wetlands Foundation, Friends of Bear River Refuge and the Nature Conservancy who have respectively donated \$10,000 and \$1,000 and \$500 to the project. The U.S. Fish and Wildlife Service, EPA and the Utah Division of Wildlife Resources have contributed over \$50,000 to the project. Utah State University was awarded a contract with the Division of Wildlife Resources to create the plan.

The development of this plan offers an exciting opportunity for anyone interested and in the Great Salt Lake to be an active participant in the master planning process. The purposes of the plan are:

1) Develop a wetlands education master plan that will increase public awareness of the values and functions of wetlands in the Greater Great Salt Lake Ecosystem

2) Promote citizen involvement in the planning process and create public ownership in the education plan. These open houses have fun activities for the whole family.

3) Coordinate the efforts of all organizations and agencies involved in wetland education.

4) Stimulate broad-based, community participation in the restoration, conservation and sustainable development of wetlands ecosystems.

During the months of March and April this year, the State conducted public open houses in northern Utah. The next meeting for information and input on the master plan will be held during the Friends of Great Salt Lake general meeting, April 27, 1999, 7 p.m. at the Sugarhouse Garden Center.

Individuals and groups with an interest in participating in this wetland education project should contact the DWR's Wetland Project Office at 538-4864 or 538-4716. For additional information check out the web site at www.utahwetlands.org

Great Salt Lake Planning Project News Update from the Planning Team

The Great Salt Lake Planning Project time table has been recently adjusted. The Department of Natural Resources will determine a new release date for the Draft Comprehensive Management Plan for Great Salt Lake by the end of March. This document will include the revised Statement of Current Conditions and Trends document, a more detailed array of draft alternatives and a general analysis of these alternatives. It will also include a public comment analysis section. A 45 day comment period will follow the release. The planning team anticipates that the final Comprehensive Management Plan will be completed by late summer. When available, copies of the Draft Comprehensive Management Plan will be available in the front lobby of the DNR building at 1594 W. North Temple in Salt Lake City and on our web page at www.nr.state.ut.us/dwr/gslplan.htm. Please contact Brenda Landureth at 538-5273 for assistance.

Can You Be Reached by E-Mail?

If you can be reached by e-mail, please send your address to: FOGSL@xmission.com. This will enable us to send special Lake alerts, general meeting updates, and information on other activities for learning more about Great Salt Lake in a more timely fashion. It also helps save postage costs.



Photos that tell a story.

Along with the article on brine shrimp and brine shrimp companies found on page 6 of this newsletter, Jim Strong submitted these photos of interest showing brine shrimp eggs deposited west of Stansbury Island during high water years.



Close view of brine shrimp eggs deposited along the high water shoreline west of Stansbury Island. The white area is snow. Photo by Rob Bero.



Dry, caked brine shrimp egg deposits west of Stansbury Island. Photo by Rob Bero.

HOW TO REACH US

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Bob Adler
Genevieve Atwood
Jim Carter
John Kadlec
Dick Nourse
Steve Simms
Ella Sorensen
Terry Tempest Williams
Wayne Wurtsbaugh

RECYCLE ALUMINUM CANS FOR FRIENDS

Please consider donating aluminum cans to Friends. Can donations will be accepted at 1176 2nd. Avenue Saturdays between 9 a.m. and 2 p.m. All proceeds will go to the FOGSL general fund. Cans must be contained in plastic garbage bags. If you have cans to donate, but can't transport them, please call Margie Paul-Hus and arrangements will be made for a pick-up. If you don't recycle aluminum, please consider starting!! This will greatly benefit Friends. Volunteers are needed for accepting aluminum cans in your neighborhood and/or taking cans to the recycling center.

Questions, please call **Margie Paul-Hus at 355-7174.**

SUBMITTING MATERIAL FOR PUBLICATION

1. **What to Submit:** original articles (historical, geological, geographical, biographical, political, fiction, poetry, etc.) or art work (sketches, photographs, etc.) which pertain to Great Salt Lake.
2. **Submitting Material:** Mail or deliver to 1117 E. 600 S., Salt Lake City, UT, 84102. Or email to: ldefreitas@earthlink.net
3. **Please call (801)582-1496** to confirm receipt of email or with any other questions, suggestions, comments, or ideas.
4. **Deadlines:** The deadlines for submittals are Sept. 16 (Fall), Dec. 16 (Winter), Mar. 16 (Spring), and June 16 (Summer).

Friends of Great Salt Lake wishes to thank Xmission.com for its generous donation of services to support Friends of Great Salt Lake on the World Wide Web at www.xmission.com/~fogsl
Kevin Landis is our webmaster.



A Thank You to our new and renewed members for Spring 1999, you are greatly appreciated.

Susan Allred
Sherry and Gerry Brown
Grant Cheever
Mary Garcia
Jocelyn Glidden
Sylvia Gray
John Groves
Lisa and David Hinds
Mike Howard and Bonnie Baxter
Amy Irvine and Brian Mecham
Mary Johnson
Jim Light
Merilyn McDonald
Audrey McElrone
Sanford Meek
Anthony and Mary Ann Morgan
Tom Neuman
Noreen Ogden
Dan Pankowski
Barb Rufenacht
Maryrose Ryan
Kevin Shumway
Marjorie Tucker
Kathy Van Dame
John Willener
Bill Yates

**Adopt-A-Highway
Spring Clean-Up Time**

Adopt-A-Highway Clean-up Scheduled for Saturday, May 15. Rain day is Sunday, May 16. We will meet at the Saltair Exit on I-80 at 9:30 a.m. and end at noon. Bring work gloves, sun (or rain) protection, a brown bag lunch, and your sense of humor. Margie has promised coffee and donuts to get us started. Some walking and bending is required but the work is not strenuous and it is a great way to get to know the shoreline ecosystem.

FOGSL T-Shirts

A new shipment of 100% cotton t-shirts with the FOGSL color logo has arrived. We have long sleeve and short sleeve in all adult sizes in green, blue, and natural. T-shirts are available at all general meetings and activities. For more information, call Lynn at 582-1496.

**Spring Field Trip to the
Inland Sea Shorebird Reserve**

A field trip to the Inland Sea Shorebird Reserve is scheduled for April 24, Saturday at 8:30 a.m. until noon with Ann Neville, Reserve Manager. Meet at the Frontage Road at the Saltair Exit on I-80. The Reserve is located on the Great Salt Lake south shore and is several thousand acres of historic Jordan River delta with saline wetland and upland complex. Acquired by Kennecott Utah Copper in the mid-1990s for mitigation of wetland losses associated with the tailings pile expansion, KUC worked closely with agencies and interested parties to preserve and enhance habitat for shorebirds. Expect to see shorebirds, waterfowl, raptors, and songbirds and identify habitats and key plant species. Bring binoculars, scopes, field guides, and a lunch. Wear sturdy walking shoes and dress for the weather. Coffee and donuts will be served to get us started.

**Thanks to You
Our Education Programs
Will Reach Many More in
Our Community**

More Thanks to the following members and supporters that generously responded to our first fundraising letter supporting our education programs.

Genevieve Atwood
John R. and Jan Ellen Burton
Mark Doman and Jane Allen
Florence Gillmor
Great Salt Lake Audubon
L. Maurine Green
Alexander Kamb and Chunwei Wang
Don R. Mabey
Cheryl P. Marzec
David Nimkin
Gibbs Smith
Doug Stark
Richard & Carlyn Sweet
Jack A. Torrey
Joe and Ellen Wixom





FRIENDS of Great Salt Lake
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Yes! I want to join FRIENDS of Great Salt Lake

Here are my membership dues in the amount of:

(check one)

- \$10 Student "Brine Fly"
- \$10 Senior "White Pelican"
- \$20 Regular "Pickleweed"
- \$30 Family "Wilson's Phalarope"

Contributing Memberships:

- \$31-50 "Brine Shrimp"
- \$51-100 "Eared Grebe"
- \$101-250 "Pronghorn Antelope"
- \$251-499 "Bald Eagle"
- \$500 Sustaining "Ecosystem Protector"

Student - be at least half time

Senior - be 62 years or older

Sustaining - any corporation,
 institute, organization, or

individuals interested in
 financially supporting
 activities of Friends of
 Great Salt Lake.

In addition to my dues,
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tax deductible

- \$10
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- \$50
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- \$250
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