

FRIENDS of *Great Salt Lake*

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Welcome West, photograph
by Andrew Lockwood

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, advocacy, and the arts.

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EXECUTIVE DIRECTOR'S MESSAGE

MISGIVINGS AFTER THE FACT WON'T PREVENT UTAH FROM BECOMING A NATIONAL DUMPING GROUND AND WON'T PROTECT GREAT SALT LAKE FROM LANDFILL CONTAMINATION

"That's not what they told us at the time," he said. "Nope, I was never told that."

Rep. Lee Perry, Chief Sponsor of HJR 20—Joint Resolution Approving Class V Landfill for Promontory Point Resources, LLC during the 2016 Utah Legislative Session. 2/6/18 Standard Examiner, Box Elder lawmaker has mixed feelings about pushing Promontory landfill approval by Leia Larsen

On October 20, 2020, for the second time, Promontory Point Resources, LLC (PPR), a subsidiary of Allos Environmental of California, submitted a Class V permit application to the Utah Division of Waste Management and Radiation Control (Division). If approved by the Division and the Governor, a Class V permit would allow PPR to bring out-of-state industrial waste to its landfill facility on the SW tip of the Promontory Peninsula in Box Elder County. This location is completely unsuitable for a landfill because of the hydrogeologic connectivity between the landscape and Great Salt Lake that surrounds the peninsula on its three sides. Compelling evidence supports the fact that this particular area of the Lake is seismically active. And the landfill location would threaten a hemispherically significant ecosystem that supports millions of migratory birds, and contributes \$1.32B, including 7,700 jobs, annually to Utah's economy.

During 2017, the first time PPR applied and tried twice to show that another Class V permit was needed in the state, an independent review of PPR's application and Needs Assessment concluded that the company failed to show that another Class V landfill was needed, especially given that we already have over 1,600 years' worth of Class V storage. Well aware of PPR's Class V pursuit, a wide range of Great Salt Lake stakeholders and FRIENDS hosted public outreach programs with the Division, raising questions and concerns about the practices of PPR and the prospect of a Class V landfill on the shores of Great Salt Lake. A white paper presented to the Division by the Great Salt Lake Institute, *Great Salt Lake as an Ecologically Significant Natural Area*, summarized research from scientific literature, the brine shrimp industry, mineral extraction industry, and ongoing research of all the major institutions of higher education in Utah to help guide decision-making regarding permitting of a Class V landfill operation in close proximity to the Lake. Even the Great Salt Lake Advisory Council, which advises the Governor, the Dept. of Natural Resources, and the Dept. of Environmental Quality on the "sustainable use, protection, and development of Great Salt Lake" submitted a letter requesting "further studies to determine the full extent of risks and the adequacy of the measures designed to address them." Having failed to show that another Class V landfill was needed, PPR withdrew its application in February 2018.

However, PPR's failure to show that need prompted the company to try another approach: make an end run and lobby the Utah Legislature to change the law by removing the Needs Assessment for Class V permits. Fortunately, those attempts during the 2019 and 2020 legislative sessions failed, but the takeaway here is that PPR tried to skirt the existing laws it couldn't satisfy by simply getting rid of them. So why is PPR reapplying?

Because out-of-state waste is where the money is.

In the 2020 Class V application, the Needs Assessment takes a completely different approach to the question of "need" than it did in 2017. This new—and theoretically improved—application focuses much more on out-of-state markets. Using these new criteria, the assessment concludes that there is, in fact, such a need. In conversations that FRIENDS had with the Division about this critical difference, we encouraged the Division to not simply take the company's word for it, but instead to conduct an independent review of the company's conclusions. In letters that FRIENDS and other conservation organizations sent to the Division, we emphasized that without an independent assessment of underlying premises contained in the latest Needs Assessment, the Division has no basis for concluding that the underlying facts and conclusions contained in that assessment are accurate. Given that, we would expect the Division to pursue the review in order to make an informed decision on this important matter.

A March 3, 2021 article *California Dreamin'?* written and researched by Eric Peterson and Jennifer Greenlee of *The Utah Investigative Journalism Project* in partnership with *The Box Elder News Journal*, calls into question both the assumptions used in the assessment regarding the extent of the available California market, as well as some possible conflicts of interest among the relationships of the various parties involved in the PPR landfill. Given the ambitiousness of PPR's proposed Class V operations plan, and the possible adverse consequences of getting it wrong, it is absolutely critical that the assumptions and conclusions contained in this latest Needs Assessment be verified. And although nowhere in the application does PPR indicate that it would consider out-of-state coal ash—a waste product from coal fired power plants that contains toxic substances like mercury, arsenic, and lead from throughout the United States—once a Class V permit is issued, a subsequent provisional request could be made



to the Division to bring these wastes into the state. So due diligence NOW is imperative.

A little bit of historical perspective always helps:

Way back when in 2001, two thousand acres of land on the SW tip of the Promontory Peninsula were purchased by *Promontory Point Land Resources, LLC* to create a landfill. After a bewildering number of name and legal status changes, in 2004 the Division granted a Class I permit to *Promontory Landfill, LLC* allowing that new owner to take in-state municipal waste once certain conditions were approved by the Division. Those conditions included construction of the facility and installation of groundwater monitoring wells, a financial assurance bond to cover closure and post-closure costs, and contracts with local governments. Around 2016, having recently purchased the relatively unchanged property that came with the Class I permit (due to expire in August 2021), PPR secured \$16.25M in bonding from the Utah Private Activity Bond Authority. Around this same time, PPR managed to persuade Representative Perry to sponsor legislative approval of PPR's Class V plans (HJR 20), a necessary step for a Class V permit. With bond money burning a hole in their pockets, in 2017 PPR used those funds to construct the first phase of its landfill, but without letting the Division know it was doing that. The Division only learned that construction had begun through a news report, even though coordinating construction of a landfill with the Division is standard procedure. Details, details.

This pattern of begging forgiveness rather than asking permission was repeated when the company installed its three new monitoring wells without Division approval. In fact, the Division went on to suggest that the company conduct a "flow and transport model" to ensure PPR had adequately placed its wells to detect leaks. The company "disagreed," refused to do the modeling, and insisted that the Division approve the wells it had already installed. Given that the purpose of the monitoring wells is for early detection of waste stream contaminants that leave the landfill and percolate into the surrounding landscape and the groundwater that flows to the Lake, this is where FRIENDS stepped in to challenge the Division's approval of those wells without that modeling.

The issue is that the substrate of the landscape where PPR's facility is located is fractured bedrock, and experts agree that strategic placement and depth of the monitoring wells under this circumstance must be informed by flow and transport modeling to maximize early detection of leaks. Compelling data exists to support evidence that regardless of how durable landfill liners are, they eventually will leak. And the placement of monitoring wells to detect leakage is critical to addressing the problem early on. Adding insult to injury, when a landfill is located next to a waterbody, the contamination to the environment is compounded exponentially. In this case, the Great Salt Lake ecosystem would be the recipient of these

contaminants which would impact the unique ecological values of the system that affect the food web for birds and brine shrimp, as well as adjacent industrial mineral operations like Compass Minerals that produces organic potassium sulfate, a fertilizer for fruits and nuts. Bruce Anderson, president of Mineral Resources International, a family-owned company that harvests minerals from the Lake that are sold as human supplements to more than 50 countries stated, "We're concerned about the unknown that is not adequately planned for, and that's why I believe that site should have been considered a fatal flaw to begin with because of the inability to plan for and mitigate the huge risk in the event of a significant natural disaster."

Which brings us to PPR with a newly constructed landfill that's been empty for almost four years, and with over \$16 million in bonds that have to be paid off. Why is it empty? Because there's a tight municipal waste market; the landfill is located where it would take lots of truck trips and lots of miles to haul waste to its facility, and with all of that the company has failed to secure any municipal contracts. That math, along with mounting financial pressures, has put PPR in a position where it either obtains a Class V permit for the Promontory Point landfill, or the state is left with a very expensive hole in the ground.

As an aside, during the 2021 session, a commendable step toward justice was taken by Rep. Tim Hawkes who sponsored HB 399—*Approval of Nonhazardous Solid or Hazardous Waste Facilities*. The law requires that legislative approval of a nonhazardous solid or hazardous waste facility be automatically revoked if an application is withdrawn. Although the sweep of the law could not be retroactive to include PPR, it's a step in the right direction for the future to prevent the legislature from providing a "blank check" for applications that lack merit. So much for hindsight, right?

Meanwhile, given that the Division has shown a pattern of simply endorsing whatever PPR wants to do, and has failed to require the company to take the steps necessary to show that this landfill will not substantially harm the Lake, there's no reason to believe that the Division will act differently if it approves PPR for its Class V permit. As for PPR, we have very little faith that the company will police itself, be accountable and transparent in its practices, and regard the significance of the Great Salt Lake ecosystem. With all of that, and because FRIENDS' mission is to preserve and protect the Lake, we strongly oppose the company's efforts to obtain this Class V permit. This landfill sits on the very shores of the Lake—which would be a scary prospect even if the landfill contained nothing but local waste. It's unfathomable that PPR might actually make Promontory Peninsula the dumping ground of the West. I trust that you feel the same. And if you do, I hope you'll join us in expressing your opposition to the Division about this permit.

In saline and spring,
Lynn



FRIENDS' ORGANIZATIONAL STATEMENT

Founded in 1994, FRIENDS of Great Salt Lake is a membership-based nonprofit 501c3 with the mission to preserve and protect Great Salt Lake ecosystems and increase public awareness and appreciation of the Lake through education, research, advocacy, and the arts. The long-term vision of FRIENDS is to achieve comprehensive watershed-based restoration and protection for the Great Salt Lake ecosystem.

FRIENDS of Great Salt Lake sponsors programs related to our mission statement: Lakeside Learning, the Doyle W. Stephens Scholarship, the Great Salt Lake Issues Forum, and the Alfred Lambourne Prize.

Lakeside Learning Field facilitates 2.5 hour inquiry-based educational field trips for 4th grade students. The trips combine informal environmental education strategies while incorporating science, technology, engineering, art and math (STEAM) to reinforce the Utah Common Core State Science Standards. Lakeside Learning emphasizes learning through participation.

Within the research component of our mission, we sponsor the Doyle W. Stephens Scholarship for undergraduate or graduate research on Great Salt Lake ecosystems. Established in 2002, the scholarship supports students in new or on-going research focused within the Great Salt Lake watershed. Recent project winners span the effects of changing salinity on microbialites to the impacts low water levels in Great Salt Lake have on Utah's air quality.

FRIENDS is actively involved in advocating for Great Salt Lake. Every two years, FRIENDS hosts the Great Salt Lake Issues Forum to provide focused discussions about the Lake for a variety of stakeholders including policy makers, researchers, and industry leaders.

Each Forum engages the community in constructive dialogue regarding the future of Great Salt Lake.

In 2014, FRIENDS established the annual Alfred Lambourne Prize for creative expressions of our Inland Sea in the categories of visual art, literary art, sound, and movement. FRIENDS celebrates the relationship between local artists and one of Utah's most precious natural resources, Great Salt Lake. Through artistic expressions, we enhance our capacity to build awareness about the Lake and our need to preserve and protect it for the future.

FRIENDS maintains a Board of Directors and Advisory Board composed of professionals within the scientific, academic, planning, legal, arts, and education communities. Staff members include, Lynn de Freitas, Executive Director; Rob Dubuc, General Counsel; Holly Simonsen, Membership & Programs Director; and Katie Newburn, Education & Outreach Director.



Snowy Plover

Photograph by Max Malmquist,
Audubon Saline Lakes Outreach Associate

On The Cover

"Early morning light washes over Antelope Island onto White Rock Bay as wind whistles through the common sagebrush. I remember arriving at this spot in the dark before sunrise, before the scale of my surroundings became apparent. The vastness of Great Salt Lake was foreign to me (1700 SQ miles). I was born in southern Ohio, where forests dominate the landscape and streams wind through the hills. The largest expanses are the wooded prairies that dot the ancient forests. As the sun began to rise from my perch, Fray Peak slowly became visible in the distance across the bay. I thought about the importance of the lake to humanity throughout the ages; how impressive it must have been to those who first set eyes upon it. Clouds began forming over the bay and I clicked my shutter adding another moment in time to the history of Great Salt Lake. I've been photographing the United States now for 9 years and I can say that Great Salt Lake was perhaps my most intriguing subject. Its size, diversity and simple beauty drew me back countless times during my time in Salt Lake City."

— Andrew Lockwood

Website: andrewlockwoodphoto.com

Instagram: [andrew_lockwood_photo](https://www.instagram.com/andrew_lockwood_photo)



Utah Juice
by Kelly Hannah
watercolor on paper, 12 x 16

“The power, focus, and purpose of the locomotive intrigues me, especially as it rolls across the expansive space of Great Salt Lake, where direction natively wanders and meanders away from a cold steel rail. Here is the intersection of Utah Juice, which may just be somewhere near Rumi’s field.”



WEATHER MODIFICATION

GIVES MOTHER NATURE AN ASSIST

With concern about the negative trend in water elevation of Great Salt Lake, which may result in setting a new record low this year, many are trying to figure out what can be done to preserve this natural wonder. In partnership with local agencies and governments, the Utah Division of Water Resources (UDWRe) coordinates a statewide cloud seeding program that augments Utah snowpack. In Utah, Cloud Seeding is the deliberate modification of the weather by adding particles to a cloud via a ground generator in an attempt to induce more snowfall than would naturally occur.

Cloud seeding in Utah

Utah has been cloud seeding to augment water supply since the 1950s. Cloud seeding is done exclusively during winter because conditions aren't favorable during the warmer months. The Cloud Seeding Act of 1973 authorized UDWRe to oversee cloud seeding projects. UDWRe cost-shares up to 50% of expenses with local sponsors for a statewide maximum of \$350,000 per year. Arizona, California, and Nevada contribute additional funds to supplement water supplies in the Upper Colorado River Basin. Last year these three states provided \$200,000 to expand cloud seeding in Utah.

Local sponsors contract with North American Weather Consultants (NAWC) to cloud seed. Sponsors include Bear River Water Conservancy District (WCD), Cache Water District, Weber Basin WCD, Provo River Water Users Association, Central Utah WCD, Emery WCD, Utah Water Resources Development Corporation, Duchesne County WCD, Uintah WCD, and Salt Lake City Department of Public Utilities (SLCDPU).

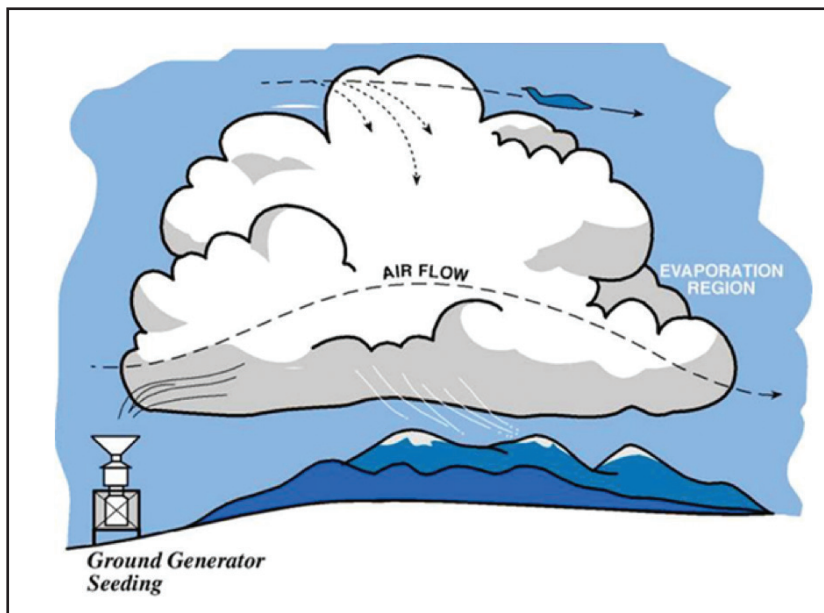
NAWC meteorologists are well-recognized cloud seeding experts with decades of experience. They monitor atmospheric conditions and weather forecasts, then organize and schedule hundreds of technicians who operate cloud seeding generators. NAWC provides monthly and annual reports on cloud seeding activities.

AWC and UDWRe work with the Utah Climate Center (UCC) who provides independent research, program assessments, and advanced tools to help guide and improve cloud seeding operations. UCC recently

published a report assessing the suitability of Utah's cloud seeding conditions. A recent article titled "A Modeling Examination of Cloud Seeding Conditions Under the Warmer Climate in Utah," published in the journal *Atmospheric Research*, assesses the suitability of seeding conditions under alternative futures based on climate change modeling.

How does it work?

A cloud is made of water droplets and aerosol particles such as dust, ice, or sea salt floating in the sky. When cloud temperatures cool to the dew point, water droplets form from vapor, but this only happens because our atmosphere is "dirty." In clean laboratory conditions, water can remain in a liquid state down to -39°C . This Supercooled Liquid Water (SLW) can sometimes be seen in the form of rime ice on a tree, airplane, or chairlift.



Cloud seeding application process using ground-based generator and aircraft.

Since particles around which water freezes can be relatively sparse—some clouds do not contain enough particles to efficiently convert SLW into precipitation—cloud seeding attempts to assist the natural process by providing the cloud with appropriate types and numbers of particles at the proper times and places. Particles with a geometric shape resembling that of an ice crystal, such as silver iodide, can provide clouds with additional particles needed to form an ice nucleus and thus increase the efficiency of precipitation. Silver iodide—the predominant seeding particle used



in Utah—is released from ground-based generators, as many as one quadrillion particles from one gram of silver iodide. The generators are placed along foothills and higher elevations where the release of the ice-nucleating particles is timed so that air currents carry them high into the cloud.

Why does Utah cloud seed?

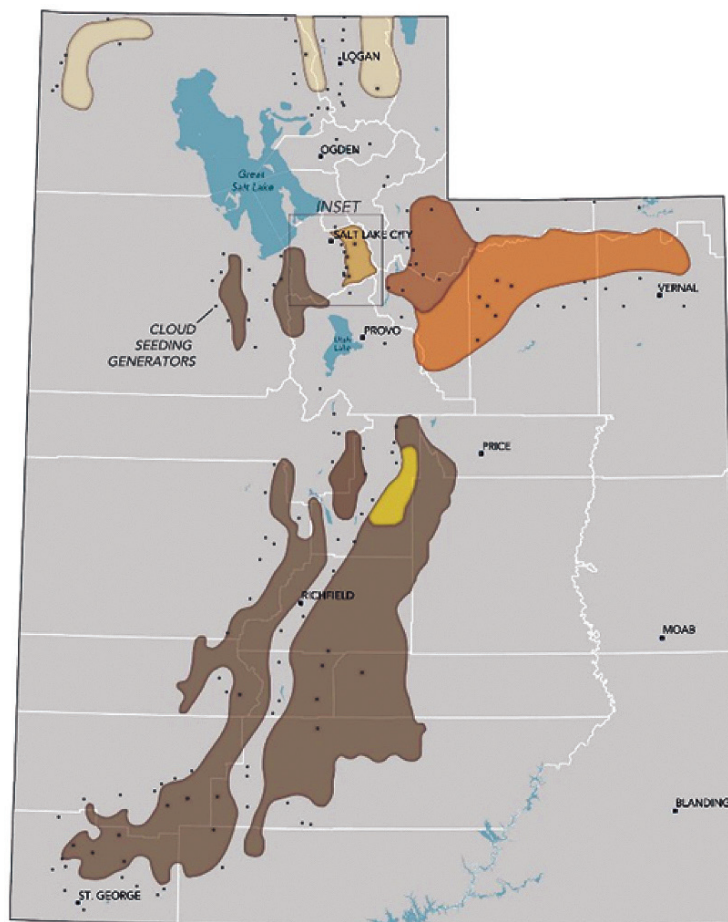
Cloud seeding has been estimated to increase annual statewide April 1st snow water equivalent (SWE) in targeted mountain ranges by about 4%. This increase in SWE ranges from 1% up to 13%, with the greatest increases in drier mountain ranges and the lowest increases in the wettest ranges, such as the Uinta Mountains. Every five years, UDWRe estimates the effect of seeding on runoff. In 2018, the estimated increase in runoff from all targeted ranges was 187,000 acre-feet, translating to a cost of \$2.18 per acre-foot.

What more can be done in the Great Salt Lake watershed?

While Utah supports programs in Cache and Box Elder counties, no areas in the Idaho and Wyoming portions of Bear River Basin are actively targeted for seeding. However, cloud seeding occurs in other areas of the two states. Bear River, and consequently Great Salt Lake, could benefit from cloud seeding in Wyoming and Idaho. In Utah, seeding could be done along the Wasatch Front in Weber, Davis, and Utah counties. A program in partnership with SLCDPU covering Salt Lake County was started in 2018. Program costs are relatively expensive in these urban areas, but typically, the price and demand for water are far greater.

Little doubt exists amongst meteorologists and atmospheric scientists concerning the theory of cloud seeding, though some still question its effectiveness. Concerns include the application method, the scale of application, and the magnitude of the effect. Actions that are being taken in Utah to better address these issues include: NAWC constantly evaluates their program operations looking for ways to improve, UCC has developed forecasting tools and assessed past and future opportunities to seed across the state, UCC and NAWC are designing an experiment to better measure the impact of cloud seeding in the Uinta Mountains next year.

Water in the West is precious. Elaborate, expensive, and difficult endeavors are taken to assure regional water security. Localized cloud seeding is not a solution to water security problems, but it is a simple, practical, and economical way to enhance our precious water supply.



Mountain ranges targeted for winter cloud seeding.
Black points represent the usual location of ground-based generators.

Additional resources:

UDWRe site houses annual reports, program history and recent studies:

water.utah.gov/cloudseeding

The UCC website provides 84-hour forecasts of relative atmospheric variables to guide cloud seeding operations:

climate.usu.edu/cloudSeeding

The Weather Modification Association provides professional network and resources:

weathermod.org

North American Weather Modification Council provides a forum and council:

nawmc.org

All US cloud seeding operators are required to submit reports to NOAA. They can be found in this archive: library.noaa.gov

Jake M. Serago,
Water Resource Engineer,
Utah Division of Water Resources

Garrett Cammans, President,
North American Weather Consultants

CONSERVING GREAT SALT LAKE'S WETLAND

...MANAGERS

As a friend of Great Salt Lake, you well know the Lake's water level is shrinking at an alarming rate and we are losing precious wetlands. While dedicated legal and policy experts are working hard to secure water for the ecosystem, you may know less about the work of Great Salt Lake's biggest champions and tireless advocates: our wetland managers.

Our wetland managers are tasked with maintaining roughly 200,000 acres (or about 60 percent) of Great Salt Lake's wetlands as bird habitat. Management falls under the jurisdiction of many entities, each with their own specific objectives and mandates. As far back as the 1800's, Great Salt Lake's first wetland managers were similarly tasked with maintaining and creating bird habitat. While the job title and basic directive remains the same for today's Great Salt Lake wetland managers, the requirements of a wetland manager reflect the many challenges the Great Salt Lake ecosystem is up against.

The unique ecology of Great Salt Lake's wetlands, coupled with complex management issues requires that managers develop their expertise over decades of service to their respective wetlands thus are difficult to replace. There are few academic programs or experiences that can prepare one for managing these wetlands. If a manager is lost to another job, retirement, or a budget cut, the time it takes a new manager to effectively on-board is considerable. More importantly, the institutional knowledge of our career Great Salt Lake wetland managers is irreplaceable. Qualifications and expertise of a Great

Salt Lake wetland manager are many and include:

- Bachelor's or advanced degree
- Wildlife science and ecology
- Contagious diseases
- Chemical applications (e.g., herbicides)
- Developing and directing programs
- Budgets
- Supervising personnel
- Research and technical reporting
- Data management
- Grant writing
- Coordination among peers
- Recreation management
- Water law and policy
- Agricultural irrigation
- Invasive species
- Environmental regulations and policy
- Community outreach and education
- Social Media
- Grazing and range management
- Security and trespass/enforcement
- Heavy machinery and maintenance
- Government contracting
- Volunteer coordination

The current class of Great Salt Lake wetland managers are extremely dedicated to and passionate about the Great Salt Lake ecosystem, seeing themselves as stewards of the lands they manage. However, we are at a pivotal time in the management of the Great Salt Lake ecosystem. Managers are increasingly taxed by the continuing complexity and scope of the position. A significant contributor to this pressure is the lack



Gate at Farmington Bay WMA created by Corey Webb, dedicated waterfowler. Photograph courtesy of Jason Jones.





White faced ibises and phalaropes fly over a Waterfowl Management Area. Photograph courtesy of Janice Gardner.

of resources wetland managers are provided. Some of the more financially strained managers are with the Utah Department of Natural Resources, where a single manager can be responsible for several Waterfowl Management Areas, totaling an estimated 31,000 acres of habitat per manager. For at least three decades, funding for wildlife and habitat has been in decline and not keeping pace with modern day needs. Low salaries for wetland managers are further complicated by the spike in cost of living as the Wasatch Front urbanizes.

Will tomorrow's wetland managers be willing to sacrifice their ability to own a home or retire in exchange for their part in conserving North America's greatest bird habitats?

In early 2020, Ashley Kijowski of Utah Division of Wildlife Resource's Great Salt Lake Ecosystem Program and Janice Gardner of Wild Utah Project (and both former Board Members of FRIENDS of Great Salt Lake) conducted interviews with wetland managers about their successes, challenges, and most pressing needs.

One of the common themes wetland managers expressed was an urgent desire for improved flow of knowledge among their peers. Managers belong to or attend very few professional associations, working groups, or conferences because they do not pro-

vide the level of detail needed to inform their day-to-day work. It is also difficult for managers to prioritize attending meetings over essential work in the field, especially when events overlap with their busiest times of the year, like vegetation treatment seasons or waterfowl hunts. Most often, the responsibility to organize events falls on the managers themselves, who are already stretched thin.

Managers expressed that if they had opportunities to grow the personal relationships with their peers, it would increase knowledge-sharing and understanding of techniques. Where professional relationships do exist among managers, they freely share "lessons learned" and there are direct ties to improved outcomes for Great Salt Lake's wetlands. To build upon this, extra capacity is needed to organize events that support our managers with their information and networking needs.

Kijowski and Gardner are committed to supporting wetland managers by furthering communication and other priority needs which include phragmites (*Phragmites australis*) control and quantifying the water needs of wetlands. Without our managers and their expertise, the Great Salt Lake ecosystem and the birds that rely on it will suffer. We see our managers, the on-the-ground experts, as key to conserving Great Salt Lake for years to come and they need the community's support. To read the full study, Great Salt Lake Wetland Habitats: A Needs Report Based on Interviews with the Managers, please visit wildutahproject.org/publications.

Janice Gardner, Wild Utah Project
Ashley Kijowski,
UDWR Great Salt Lake Ecosystem Program



HCR-10 BRINGS PEOPLE WHO LOVE GREAT SALT LAKE TOGETHER

During 2019, the Utah Legislature passed, and former Gov. Gary Herbert signed, HCR-10 “Concurrent Resolution to Address Declining Water Levels of the Great Salt Lake.” HCR-10 recognizes “the critical importance of ensuring adequate water flows to Great Salt Lake and the wetlands to maintain a healthy and sustainable lake system.” It is crucial to note that Great Salt Lake is a terminal lake that contributes billions of dollars in economic activity, it has hemispheric importance within the Western Hemisphere Shorebird Reserve Network, and increases our snowpack from the lake effect snow. One of the critical issues facing Great Salt Lake is lower lake levels.

Great Salt Lake issues are a tough subject and solutions often cause stakeholders to be pitted against each other. HCR-10 made collaboration among environmental, developmental, and economic interests possible. It provided a forum where everyone came to the table with one goal in mind: improve the lake levels and sustain a healthy watershed. The Utah Division of Water Resources is committed to collaborating with organizations on special topics, like Great Salt Lake, because we recognize that collaboration is really what drives success and this resolution proves it.

After all was said and done, HCR-10 provided recommendations that should be considered to meet the goal of addressing and mitigating declining lake levels. We are pleased with the efforts that so many put into creating HCR-10. It provides a tool that roadmaps future studies and projects that lead to protecting one of Utah’s most important water resources. The focus areas of HCR-10 include:

- Educate & Engage
- Improve Information & Decision Making
- Optimize Agriculture Water Use
- Optimize M&I Water Use & Land Use/Water Planning
- Refine Legal & Policy Options
- Sustain Efforts Over Time

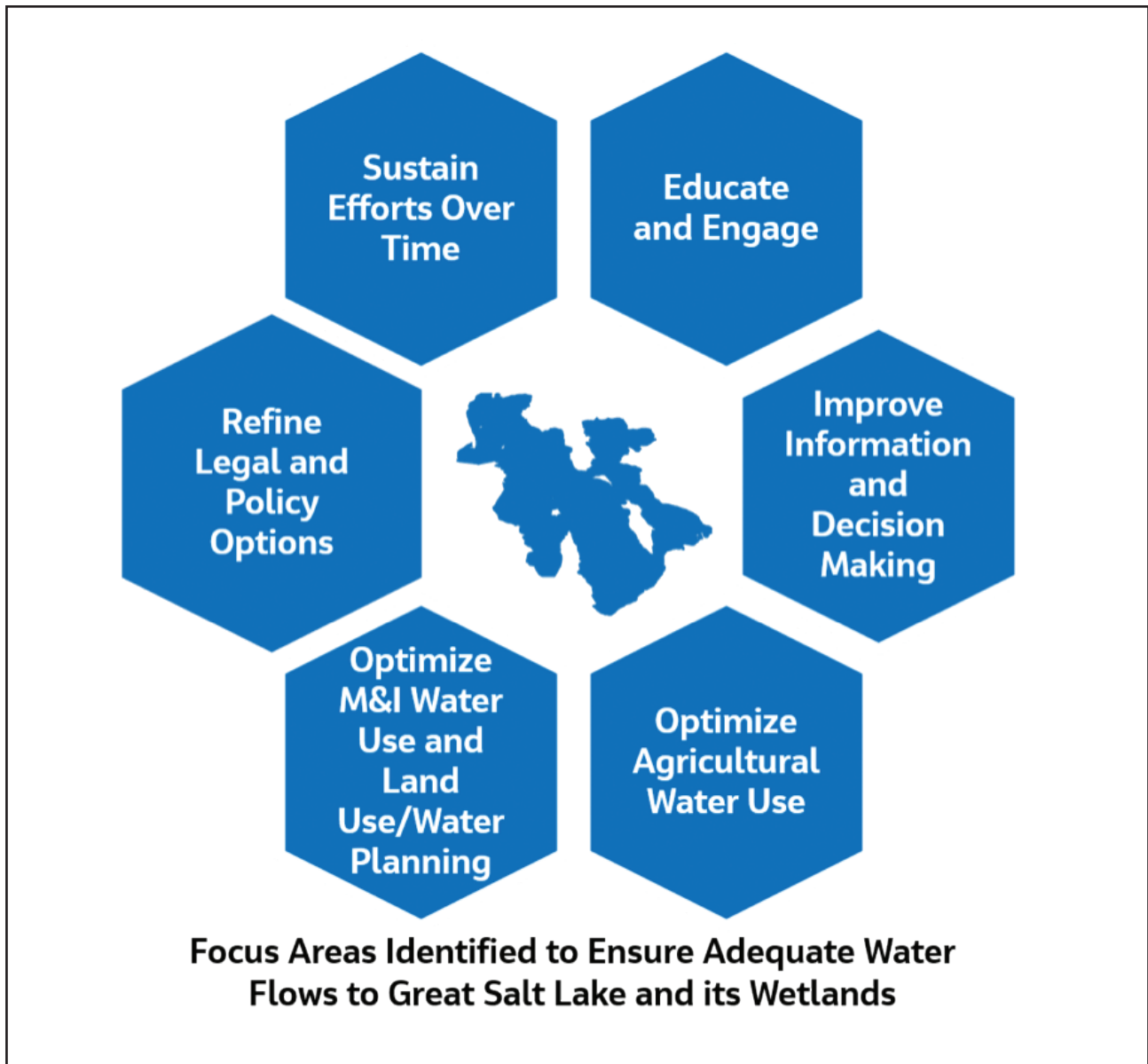
As all of us recognize, water is complicated. Water Resources has a mission to plan, conserve, develop, and protect Utah’s water resources. We are grateful for our passionate staff and Great Salt Lake advocates in our office. For instance, Craig Miller; with many years of experience and dedication to modeling and analyzing Great Salt Lake, Miller is one of Utah’s Great Salt Lake experts. His expertise was used in the development of the Great Salt Lake Integrated Model that has been instrumental in understanding the lake and is a tool that we can continue to improve.

Water Resources doesn’t have any regulatory authority over the lake, but it is an important resource that is factored into our water planning. Many of our staff see Great Salt Lake almost every day—including us—as we commute to work, visit family and friends, and run errands. Like you, we are concerned about the many conditions that can negatively impact the lake and recognize the balancing act required to keep it healthy. Drought, rapidly growing communities, and lack of instream flows can result in changes in wildlife habitat and wetland areas, and decreased economic activity.

Since water is life, it only makes sense that it’s the life of Great Salt Lake. How do we sustain and improve lake levels at Great Salt Lake? That’s what HCR-10 is all about—finding solutions to those questions. Utah is experiencing rapid population growth. Visitors have discovered Utah is a great place not only to visit but also to live. Can we blame them for wanting to live here? After all, Utah is a pretty great place. Newcomers need water, agriculture needs water, industry needs water, and Utah’s economy needs water. And Mother Nature can be generous one year and stingy the next. Water Resources is diligently working to find a balance that will provide water for all.

We are excited that the legislature funded two projects that were discussed in detail in the HCR-10 final report. The first project included funding for integrating water and local land use planning.





The goal is to bring together local land use authorities and their corresponding water suppliers so planning efforts are better coordinated. This will help us identify barriers and provide resources to other land use authorities. The second project is a Great Salt Lake groundwater study that evaluates the connection between groundwater and the lake.

As we work on issues through our mission, we strive for a balance that will create “win-win” solutions. It’s not an easy task and we know there are improvements to be made on all fronts around the state. We know that water development is not the only solution, nor is conservation. It’s going to take a wide variety of strategies in an ever-chang-

ing climate to meet Utah’s future water needs for the growing population and its natural environments. Most importantly, we recognize the need to tackle these tough challenges together as a water community. HCR-10 is the most recent example of a stakeholder group getting together to move the needle and work together. It is our hope that we will continue to work on these issues with the Great Salt Lake community.

Access full report here:
<https://ffsl.utah.gov/state-lands/great-salt-lake/>

Todd Adams, Director &
Candice Hasenyager, Deputy Director,
Utah Division of Water Resources



SEEKING SOLACE

Desert, sea, sea, desert...my soul blends these seemingly different environments into a dream of possibility. As a child, I escaped each evening from the confines of our family beach house to the nearby dunes that fronted the Atlantic, wave after wave teaching me patience, the pleasures of solitude, the mystery of infinity. Decades later, the Southern Utah desert would beckon, its solitude and reaching skies offering much of what the sea once gave me.

I am edgy without outlets such as these, a tight wire desperate for release, a caged cat stalking the Wasatch foothills for the faraway view and the unpeopled summit. But when the urban tension grows too much for the foothills and time is too short for Southern Utah, I escape to the surreal displacement of mind and body that is Antelope Island.

In my imagination Great Salt Lake becomes an inland sea; it stretches seamlessly to the snow-capped mountains beyond, with no hint of the million or so people, the massive highway systems, and the skyscrapers that lie between. Atop Frary Peak I am in Norway looking into a fjord, I am in Israel on the shores of the Dead Sea, I am in Bolivia on the banks of Salar de Uyuni. My spirit travels freely, my mind opens, anxiety metamorphoses into creativity.

I walk this island, around its edges, over its hills, up its mountains. My body stretches and sings, all legs and lungs and heart. With my binoculars I scan for antelope, big horn sheep, coyote. I see bobcat and coyote scat, and not infrequently a coyote itself lopes by, tossing me an over-the-shoulder glance as it does. Depending on the timing, Glacier lilies, Indian paintbrush, Balsamroot, Lupine, Globemallow, Sand verbena, and other delicacies dot my path. Some, such as Miner's lettuce (*Claytonia perfoliata*)

and Gray's biscuitroot, are edible—the former offers vitamin C and is so named because miners ate it to stave off scurvy; the latter was an important food source for Native Americans.

There are secrets here—a perennial spring, the delicate stream that threads a mountain drainage, a bobcat's den, a chukar's nest. Rock faces with inviting conglomerate surfaces tempt me to bring my climbing shoes, but I never do. There is too much to do here, what with all the walking, and listening, and watching, and thinking, and dreaming. I am both in my body and out of it.



Antelope Island Hike, photograph by Charles Uibel

Sometimes, needing more than a day, I camp at Bridger Bay. When I can, I choose site 8, with its lakeside perch and its polite distance from Others. With the setting sun the sky melts into the Lake, sometimes pewter gray, sometimes the rosy orange of desert

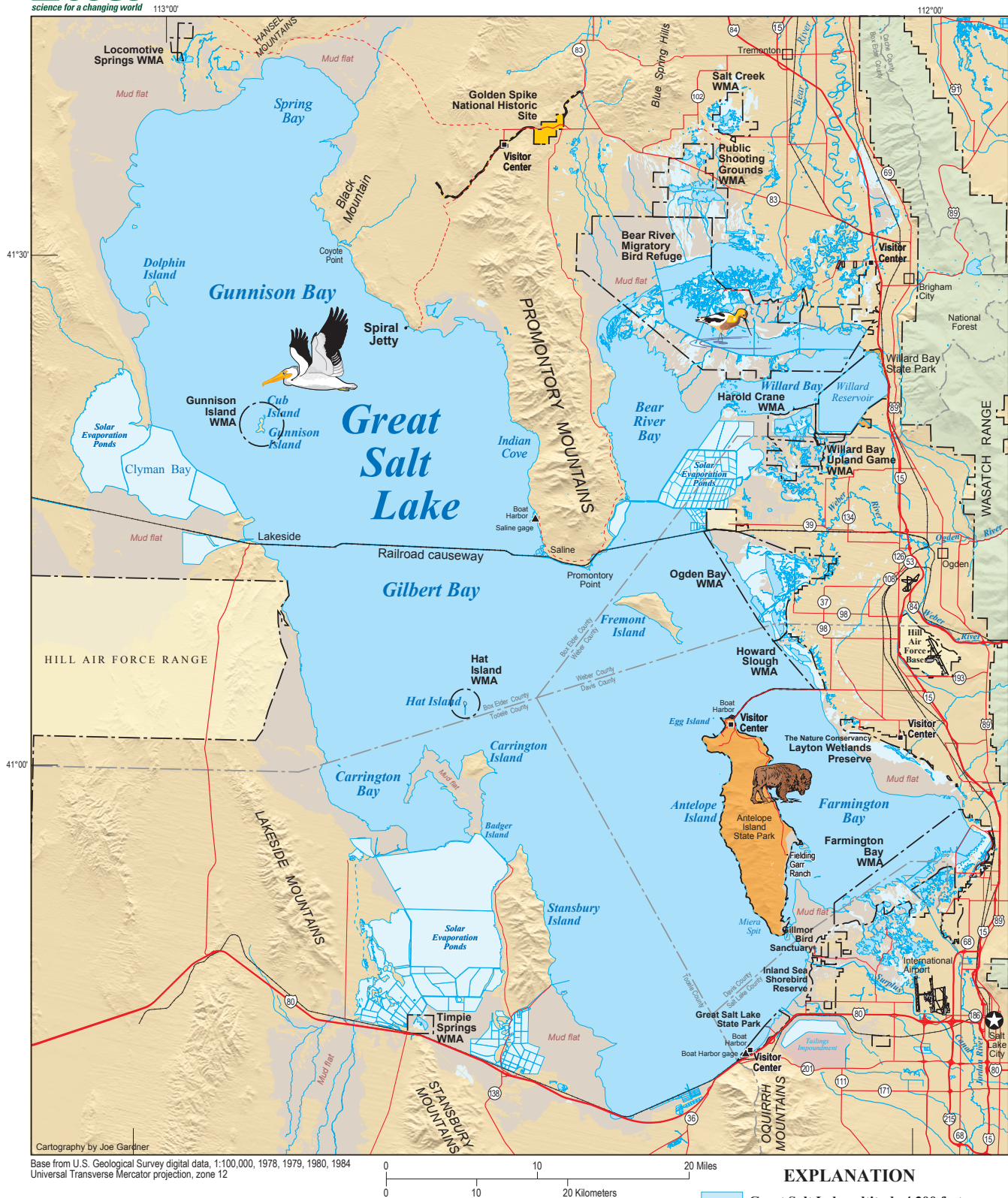
rock. As it grows dark I-15 emerges in the distance, a string of dancing lights I turn away from, unwilling to be reminded that this highway allows me to be here. In the morning, meadowlarks welcome me to wakefulness. I sip coffee in the first light, watching the island and Lake reemerge, feeling full and calm and peaceful.

But most evenings I join the stream of cars and trucks barreling down the freeway toward a city I had forgotten was there. I am okay now, the pressure has been released. I give thanks to this piece of nearby wildness that restores my sanity. I pray it may remain—there when I need it, there when I don't.

Margie McCloy, retired magazine writer and outdoor lover living in Salt Lake City



GREAT SALT LAKE MAP



LOOKING FORWARD TO PUTTING THE “TRIP” BACK IN “FIELD TRIP” SOON

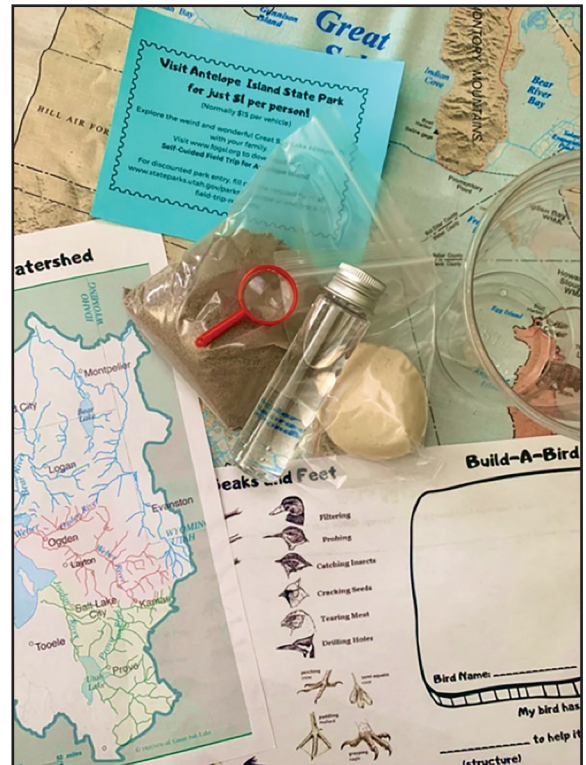
“Virtual field trip.” It sounds like an oxymoron, doesn’t it? But that’s what we’ve been doing this spring to keep bringing Great Salt Lake to northern Utah’s fourth graders.

Here are some lessons we’ve learned along the way:

1. Teachers are HEROES. Whether they’ve been enforcing masking, distancing, and cleaning in their classrooms, orchestrating Zoom calls with 25 ten-year-olds, or in many cases performing both of those Olympic events at the same time, teachers deserve gold medals for their herculean efforts.
2. Our kids are resilient. Students have adapted quickly to new technology, new ways of learning, and new social norms. The last year has undoubtedly taken a toll on them, but the way they’ve persevered inspires great hope for the future.
3. A field trip is more than just a trip. We know there is nothing like wading into Great Salt Lake and catching brine shrimp for the first time. However, hearing our students shout in awe as they watch oolitic sand and vinegar bubble has proven that there is more to a field trip than the destination. Learning something new, meeting an expert, mixing up the routine, getting dirty, and having fun – these are all memorable experiences that we’re thrilled we can still provide.

When we began to strategize what our spring field trip season should look like, we started by sending a survey to all the teachers who had previously attended field trips. We asked how their students were currently attending school, if they would be interested or allowed to attend an in-person field trip, and what kinds of resources we could offer to support them. Because we work with up to ten different school districts, each with their own approach to this school year, the feedback was fairly mixed. However, almost every teacher responded that they were interested in a live, virtual field trip as an alternative to coming in person. With that, our strategy became apparent, and we started developing the program and scheduling “trips.”

So, what is a Virtual Lakeside Learning Field Trip? It’s a one-hour Zoom session in which our Education team meets with a fourth-grade class, live from Antelope Island State Park or Great Salt Lake State Park. We assemble and deliver activity supply kits for each student to use during the program, complete with



Virtual field trip supply packet, assembled and delivered to students by FRIENDS’ Education Team. Photograph courtesy Katie Newburn.

oolitic sand, vinegar, salt dough, maps, and worksheets. In our time together, we look at photos and videos, ask questions, share ideas, and go through some of the same hands-on activities we would typically do on the shores of Great Salt Lake.

It hasn’t been the smoothest sailing. Think about your average group Zoom call. Someone’s on mute; someone’s frozen; someone can’t see the screen share; you ask a question that’s answered with a lengthy, awkward silence. It turns out that these universal experiences apply to virtual field trips as well. On top of that we’ve added the elements and spotty mobile hotspot service, just to keep things interesting.

Despite the challenges, we’ve had success providing





Screenshot during a virtual field trip at Antelope Island State Park featuring a slide that compares sand types while Katie Newburn (top) conducts an on-site experiment met by various levels of student engagement. Photograph courtesy of Katie Newburn.

a hands-on, participation-based program that helps our students better understand and appreciate Great Salt Lake. Our students learn about the unique physical structures of migratory birds and how they function to help those birds survive. They learn about our terminal basin and build a model showing the mountains and rivers that define the Great Salt Lake Watershed. They learn how energy flows through Great Salt Lake's food web, from the sun to algae to brine shrimp to birds and beyond. Most importantly, they learn that Great Salt Lake is an ecosystem under threat, and that we need their help to protect it by conserving water and being a FRIEND* however they can.

*As a reminder, here's how you can be a FRIEND of Great Salt Lake, too:

- Use less water in your yard and home.
- Keep our Watershed clean by picking up litter.
- Advocate for policy that will keep water flowing to Great Salt Lake.
- Visit Great Salt Lake often and bring along someone you can help better understand and appreciate it.

- Renew your FRIENDS of Great Salt Lake membership, gift one to a friend, or make an additional contribution to fuel our work. You can even choose to support the programming most important to you: education, research, advocacy, or the arts.

So far, our virtual field trips have served 121 students, and we're on track to serve over 400 this spring. We're grateful for the donors whose financial support has made this program possible, for the teachers who were willing to try something new, and for the scientists and healthcare workers making great strides to return us to normalcy. We're proud of what we've been able to do, and we're also ready to put the "trip" back in "field trip." We hope we'll see you out there this fall.

For more information about our Virtual Lakeside Learning Field Trip program, visit www.fogsl.org/programs/education-programs

Katie Newburn,
Education and Outreach Director,
FRIENDS of Great Salt Lake



DELTA WATERFOWL: PROUD HISTORY OF IMPLEMENTING PROGRAMS THAT BENEFIT THE DUCKS WE ALL ENJOY!

Delta Waterfowl is “The Duck Hunters Organization.” Our mission is to produce ducks and ensure the future of waterfowl hunting throughout North America. With roots tracing back to 1911, Delta Waterfowl has a long history in waterfowl conservation. Founded as a leading waterfowl research organization, today, Delta’s innovative duck-production programs—Hen Houses and Predator Management—help send ducks to all four Flyways (Atlantic, Mississippi, Central, and Pacific). We focus on conserving breeding duck habitat in the Prairie Pothole Region, a key region for breeding Pintails, Mallards, Gadwalls and many other species that migrate to the Pacific Flyway. Delta runs the largest waterfowl hunter recruitment program in North America, continually working to improve access for waterfowl hunters while defending against threats to our hunting tradition. Delta conducts cutting-edge waterfowl research to inform waterfowl management decisions that impact waterfowl hunters throughout North America.

Delta Waterfowl operates within four pillars:

- Duck Production—We deliver effective, science-based duck production programs that add thousands of ducks to every fall flight.
- Habitat Conservation—Through tireless agriculture policy efforts and incentive-based habitat programs such as Working Wetlands, Delta conserves critical habitat for nesting ducks.
- Research—The world leader in waterfowl research since the 1930s, Delta Waterfowl conducts innovative, historically important scientific work on ducks. We strive to answer questions that are critically important to ducks and duck hunters throughout North America, and all of our programs are rooted in sound science.
- Hunter3—Hunter3 is Delta Waterfowl’s bold new initiative to boost the number of waterfowl hunters in North America. The name “Hunter3” is derived by combining Delta’s position in the waterfowl world as “The Duck Hunters Organization” with the wildlife-agency world term “R3.” The abbreviation R3 stands for recruitment, retention, and reactivation. Hunter3 is Delta’s programmatic initiative to recruit, retain, and reactivate waterfowl hunters throughout North America.

One of the key points within Delta Waterfowl that attracts folks to start a local chapter in their area is that Delta offers each chapter an opportunity to invest a

portion of the funds they raise each year back into the areas they live and hunt in to benefit ducks and duck hunters. Here in Utah, chapters have built, installed, and maintain dozens of nesting structures which help boost our local population of Wood Ducks and Canada Geese as well as Dabbling Ducks. They have also invested in the renovation of disabled blinds that help those with disabilities have a quality blind in which to hunt from. These chapters have also poured new boat



Mallard hen in hen house, photograph courtesy of Delta Waterfowl

ramps at public marshes to help hunters safely and speedily launch their boats. Together with the above projects, our chapters introduce new hunters to the passion of waterfowl hunting; we spend hours cleaning and assisting others in our marshes to help make them a more enjoyable place to visit.

Research is one of the keystones of our Foundation. Our scientists and biologists work with graduate students and field technicians in Canada and the U.S. each year on research projects that benefit ducks. Some examples of these from 2020 include;





Northern Pintail, photograph by Gary Crandall

- Canvasback Nest Success—Evaluating predator management for over-water nesting ducks
- Detecting Canvasbacks using Drone Technology—Flying drones with thermal-imaging cameras to count pairs, find nests, and count broods of diving ducks. This is much more productive than the only method we have had in previous years, which was to physically walk through the marshes looking for nests. With this technology, so much more can be accomplished
- Counting Broods using Drones—Evaluating brood use of wetlands in agricultural landscapes
- Working Wetlands—Understanding farmers' perceptions of Delta's Working Wetlands Program. This program is now a part of the Farm Bill! In working to have this implemented, Delta Waterfowl did not ask for a cent in return, we simply shared the vision and impact of the program, which has great value to farmers with seasonal wetlands on their land as well as the benefit to the migratory birds that depend on these critical wetlands. Through this program, farmers with qualifying wetlands can be paid some additional funds, helping to lessen the impact of having to farm around these small, but ever so critical wetlands. Without this program in place, farmers tend to drain these wetlands so they can farm through them. With this in place, farmers can still plant and harvest these areas in dry years, but must allow the wetland to remain to benefit migratory birds as well
- Has Pintail Production Declined?—Evaluating

changes in Pintail age structure and sex ratios helps improve our understanding of this particular species of duck. Pintails face an uphill battle in duck production as they nest primarily in Alberta. Here, farmers are practicing no till agriculture, which means last year's grain stubble is still present as these beautiful ducks return to begin their nesting. These landscapes leave hens and their nests vulnerable to predators. They also struggle to re-nest and when they do, it is almost always in the same stubble which makes the hen and her nest vulnerable to predators. This is one of our species that truly faces fewer hens leaving the nesting grounds than those that entered due to easy predation. Our research has shown a huge imbalance between male and female Pintails. The males outnumber the hens 8-1!

While there are many more studies that take place annually, this gives you a glimpse into our world as we work to help train our future wildlife leaders in North America. Delta Waterfowl has a proud history of implementing science-based programs that benefit the ducks we all enjoy! Learn more by visiting our website at deltawaterfowl.org and visit our YouTube channel to view many insightful videos.

Jeff Adams, Regional Director,
Pacific Flyway of Delta Waterfowl





HOW TO REACH US

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Submit articles and
images for consideration
to Lynn de Freitas at
ldefreitas@xmission.com
or call 801-583-5593

LAKE FACT:

Q: Great Salt Lake is recog-
nized for having four critical
minerals, what are they?

A: Magnesium metal, potassium
sulfate, lithium—in
that order and with that magnitude.

THANKS FOR MAKING A DIFFERENCE

Memberships and Donations received between
December 1, 2020-April 15, 2021

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MAKING A DIFFERENCE

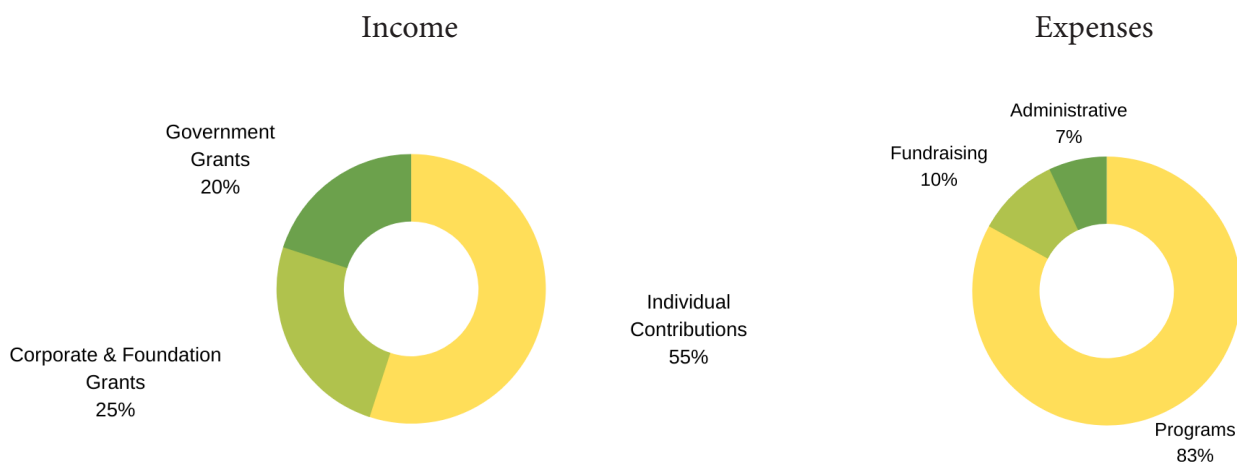
How We Do Our Work—THANKS TO YOU

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As a 501(c)(3) nonprofit, FRIENDS of Great Salt Lake relies upon the generosity of our members, individual donations, foundations, and grants. Individual memberships and donations provide the bulk of our funding at approximately 55% of our annual revenue. Foundation donations and corporate grants generate 25%, and government grants generate 20%.

With an annual operating budget of under \$300,000, FRIENDS of Great Salt Lake spends a majority of funds on Programming (83%), including our Education Programs, The Doyle Stephens Research Program, Advocacy Programs, and the Alfred Lambourne Arts Program. Fundraising costs average 10%, and administrative expenses 7%.

FRIENDS of Great Salt Lake is a member of Utah Nonprofits Association (UNA). We operate with a Donor Bill of Rights, a Conflict of Interest Policy, a Gift Acceptance Policy, and adhere to UNA's Standards of Ethics. Access our IRS form 990 and our Annual Reports on our website.



GREAT SALT LAKE:
The Gift that Keeps on Giving,
Just Add Water



The Great Salt Lake Issues Forum
May 11, 12, 13 of 2022
Fort Douglas Officers Club, University of Utah

Please Save the Date for the 2022 Great Salt Lake Issues Forum. The Forum will be May 11, 12, and 13 of 2022 at the Fort Douglas Officers Club on the campus of the University of Utah. FRIENDS of Great Salt Lake's biennial Issues Forum brings together stakeholders from the academic, political, industrial, and scientific communities to discuss the most relevant issues related to understanding Great Salt Lake. The Forum is open to the public. For more information, including registration links, visit fogsl.org/2022forum





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Great Blue Heron,
photograph by
Gary Crandall
garycranestudios.com

Although herons typically nest in large groups, known as rookeries, they tend to hunt alone during the breeding season and spend much of the year by themselves. Fish make up most of the heron's diet, but they will also prey on frogs, salamanders, insects, and even other birds.