

# FRIENDS of *Great Salt Lake*

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[www.fogsl.org](http://www.fogsl.org)

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*"The Man on His Island"*  
acrylic on canvas by Susan Kirby

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

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## WORKING TOGETHER TO PROTECT THE ECOLOGICAL VIABILITY OF GREAT SALT LAKE IS IMPERATIVE TO SOLVING THE SELENIUM MYSTERY

*"If a man will begin with certainties, he shall end with doubts,  
but if he will be content to begin with doubts, he shall end in certainties."*

- Sir Francis Bacon

Last summer, FRIENDS published a Story-Map entitled "A Selenium Story" to help our members better understand the issue of selenium contamination along the south shore of the Lake. The tale of selenium contamination in the Great Salt Lake ecosystem is a long, weaving one of legacy pollution from mining which unfortunately reveals far more about our ignorance of the Lake's groundwater system than I care to admit. When it comes to groundwater, at times I feel like we're trying to assemble a 1,000-piece puzzle without any idea what the finished puzzle really looks like.

So, where did all of the selenium come from in the first place? Selenium, like many of the "salts" we find in the Lake, is deposited into the rivers and streams feeding Great Salt Lake as a result of erosion. But, unlike the slow process of erosion, mining throws the natural deposition process into chaos by essentially fast-forwarding that deposition at an incredible rate. Salts that would take tens of thousands of years to reach the Lake are deposited in just a few years.

The problems caused by groundwater contamination from mining really started to manifest themselves back in the early 1980s. As emerging municipalities in the western Salt Lake Valley began to sink wells for drinking water, they discovered that the groundwater they were hoping to use was contaminated with cadmium, chromium, sulfate, arsenic and selenium, to name just a few. By 1983, the issue of groundwater contamination from mining had risen to the point where the state and EPA opened an investigation of the source of that contamination, with the finger of blame pointing at Rio Tinto Kennecott (RTK).

In 1986, the state filed a Natural Resources Damage (NRD) lawsuit against Kennecott for injuries to groundwater in the South Jordan

area that was "impaired by hazardous substances from RTK's past mining operation and the past diversion of the flow of Bingham Creek." *Utah v. Kennecott Corp.*, 801 F.Supp. 553 (D. Utah 1992). Further south, the investigation revealed an additional groundwater plume caused by RTK, the Zone A "acid" plume, which was tied to acidic leach waters from attempts to extract metals from mining waste rock. To give you an idea of the size of the Zone A plume, somewhere in the neighborhood of a million gallons a day of contaminated waste—or 18.25 billion gallons total—leached into groundwater aquifers in the Valley according to the EPA.

To resolve the NRD lawsuit and avoid a Superfund listing, RTK agreed to fund a reverse osmosis (RO) plant to be owned and operated by the Jordan Valley Water Conservancy District (JVWCD). Initially, the Division of Water Quality (DWQ) proposed discharging the RO plant's waste (called RO concentrate) directly into the Jordan River. That turned out to be a non-starter because the selenium and mercury levels in the discharge exceeded fresh water standards, and would have significantly impacted the Jordan River ecosystem. So, DWQ proposed doing what had always been done with industrial discharges—dump it into the Lake.

But the proposal to simply dump the RO concentrate into the Lake raised significant concerns about the impacts to the Lake's ecology, including to the many birds that depend on the Lake. While there are no "numeric" standards for the Lake (so many parts per million of a contaminant) there are "narrative" standards that protect the Lake's "beneficial uses" such as, "waterfowl, shorebirds and other water-oriented wildlife including their necessary food chain."

The need to protect the Lake's beneficial uses led DWQ to conduct a 5-year, \$3 million review



of the possible impacts to the Lake from selenium contained in the proposed discharge. The group formed to study that issue consisted of a science panel conducting research on the possible impacts, overseen by a Steering Committee, of which I was a part, who ultimately set the standard. At the end of that process, against my objections, the Steering Committee set a tissue-based bird egg standard for selenium of no more than 12.5 milligrams per kilogram (parts per million) which would allow for up to a ten percent “take” of certain aquatic-dependent birds in Gilbert Bay.

But that standard applies only to Gilbert Bay—not the whole Lake—and realistically only applies to the outfall area of the JWCD RO Concentrate discharge (Outfall 001) and the co-located RTK tailings pond discharge (Outfall 012). Eggs (when available) in the outfall area are collected as part of a comprehensive monitoring protocol annually which includes soil, water, macroinvertebrate (bugs) and brine shrimp testing as a condition of the discharge permits for JWCD and RTK.

The standard that was established—encompassed in DWQ rule 317-2-14(14)—is really a sliding scale from <5.0 mg/kg (routine monitoring) to > 12.5 mg/kg (impairment and formal TMDL required). In between those two numbers are > 5.0, which requires increased monitoring; > 6.4, which is a Level II antidegradation review trigger; and > 9.8, which is a preliminary TMDL study trigger. TMDL, for those unfamiliar with Clean Water Act terms, stands for Total Maximum Daily Load, or a “pollution budget” for a water body.

The tricky part of enforcing this standard is that you need to be able to collect enough eggs to constitute a “statistically meaningful” amount of bird eggs, which by rule is 5 eggs. If fewer than 5 eggs are collected, DWQ considers there to be an insufficient sampling to apply the rule. Unfortunately, 2024 was the first time that 5 eggs or more were collected in the outfall area since the standard was implemented. That begs the question: how do you effectively enforce a standard that is utterly dependent on collecting a sufficient number of eggs that are difficult or impossible to collect over 90% of the time? Last year (2025), for instance, only 2 eggs were collected. My response to that is that there needs to be a much more aggressive attempt to collect eggs. Either that or

change the standard to something that can be consistently implemented.

As to those five 2024 eggs, the geometric mean selenium concentration of those eggs was 10.32 mg/kg, with one egg coming in at 16.5 mg/kg. This is an alarmingly high level of selenium, and by rule triggers preliminary TMDL studies and discharge reassessment. Both JWCD and RTK were sent Exceedance Letters from DWQ, and both were required to address what they proposed to do about the high selenium levels in the eggs. Of note, the two eggs that were collected from the area in 2025 averaged 14.2 mg/kg, well above the 12.5 threshold.

Not coincidentally, the discharge zone also falls within the Kennecott North Zone Superfund Site which was recently designated by EPA as being “not protective of human health and the environment” because of an upward trend in the amount of selenium found in bird eggs on RTK’s property south of I-80. Within the North Zone is a large uncontrolled selenium plume as a result of legacy pollution from RTK processing facilities. The discharge zone is also directly adjacent to RTK’s tailings pile, which has settled 20-25 feet and is likely impacting area groundwater with contaminants.

So, what happens now? Now we have to figure out where the selenium in the bird eggs is coming from. Is it coming from the discharges? From the plume? From the tailings pile settling? We don’t know, but we believe that there is a connection here that we simply don’t understand. And until we know the answer to that question, we can’t fix the problem.

Since the 2024 sampling, FRIENDS has been making every effort to pull together all the agencies—both federal and state—and the industries involved that have a role to play in answering that question. We have also helped fund an effort by the U.S. Geological Survey to help answer that question. Working carefully and collaboratively together to inform responsible management decisions is the key to moving forward in this pursuit.

In saline and solidarity,

Lynn de Freitas



# 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 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.

Photo: *Northern Harrier* by Steve Earley.



## On The Cover:

### *The Man on His Island*, acrylic by Susan Kirby

“Alfred Lambourne, born in England, moved with his family to the American West in the 1860’s. In 1895 he lived for a year on Gunnison Island in Great Salt Lake. He referred to the island as “his” island. He authored “Our Inland Sea” while living there and wrote that “Under certain conditions, a place becomes a part of us; we own it. We absorb it into our lives. It cannot be taken from us. It is ours, and without title or deed. We are associated with a certain spot of earth; we have our lives shaped by it, or, if that be not the case, to stamp the place with our individuality. THIS PLACE IS MINE.” My painting shows Alfred Lambourne, painting in plein air, Cub Island standing on Gunnison Island. The pelicans are flying to their roosting cove and a rattlesnake warns him to stay away. The color in the dark pink areas that are isolated from the rest of the Lake is attributed to salt-loving microorganisms. He left the island with the guano sifters in 1896.”





*Wilson's Phalarope*  
photograph by Max Malmquist

# THE PROVO RIVER WATERSHED COUNCIL: ITS ORIGIN AND ITS ROLE IN THE WATERSHED TO PROTECT REGIONAL WATER SOURCES AND WATER QUALITY

In 1979, at the request of the U.S. Bureau of Reclamation, Utah Governor Scott M. Matheson committed to developing a watershed management plan as part of the construction of Jordanelle Reservoir. To carry out this commitment, he formed the Jordanelle Technical Advisory Committee in 1982 to oversee the development and implementation of the Deer Creek Reservoir and Proposed Jordanelle Reservoir Water Quality Management Plan (1984).

meaningful action in watershed protection.

## Governance and Funding

The PRWC Governing Board plays a central role in advancing the Council's mission by educating stakeholders on water-related issues, providing a forum for collaborative decision-making, and monitoring water quality trends. Board members also communicate



Deer Creek Reservoir in Winter, photograph courtesy of Provo River Watershed Council

This plan was designed to address water quality concerns associated with the new reservoir construction and to manage eutrophication in Deer Creek Reservoir. It directed the Committee to conduct ongoing water quality monitoring and to provide annual reports on watershed conditions, long-term trends, and the effectiveness of best management practices.

After 23 years of collaboration, hard work, and success, the Committee recognized the need to broaden its scope to encompass the entire Provo River watershed in order to more fully achieve its original goal of protecting regional water resources and water quality. As a result, in 2005, the Committee changed its name to the Provo River Watershed Council (PRWC).

The PRWC brings together individuals with diverse professional backgrounds and expertise who share a strong commitment to protecting and enhancing the health of the Provo River Watershed. Through strategic vision and a collaborative approach, the Council guides coordinated efforts toward shared environmental goals. This dedication to environmental stewardship inspires and mobilizes the community to take

and partner with stakeholders, promote sustainable planning and watershed practices, and provide the funding necessary to support the Council's annual operating expenses.

Funding provided by members of the Governing Board is essential to the success of the PRWC. These financial contributions support the development of comprehensive watershed plans aimed at improving water quality and promoting best land management practices. Funding also enables the PRWC to hire consultants and subject-matter experts who help expand scientific understanding of watershed conditions. Most importantly, these resources allow the organization to move beyond planning and translate strategies into meaningful, on-the-ground results.

A couple of years ago, the Governing Board engaged a consultant to develop a comprehensive strategic plan for the Provo River Watershed. This plan has proven to be an invaluable asset, as it identifies both current and emerging risks to water quality. Wildfire, drought, and development were identified as the three most significant threats to the watershed. To address



these risks, the plan includes prioritized recommendations over both 5-year and 20-year planning horizons, aligned with the level of risk associated with each threat. Overall, the strategic plan serves as a critical decision-making tool, helping the Board remain focused on the watershed's most pressing needs and guiding the effective allocation of available funding.

### **Monitoring, Data Collection, and Climate Research**

To monitor how drought, wildfire, and development are impacting the watershed, the PRWC is currently in the process of purchasing advanced water quality sensors (a sonde) that will be deployed on a pontoon anchored in Deer Creek Reservoir above the dam. The pontoon allows for continuous deployment of the sonde, enabling water quality measurements to be collected throughout the entire water column every hour of every day. In addition, the pontoon will be equipped with climate sensors to measure air temperature, relative humidity, wind speed and direction, and solar radiation.



Jordanelle Reservoir, photograph courtesy of Provo River Watershed Council

### **Education, Outreach, and Restoration Efforts**

The PRWC also uses funding to support education and outreach efforts, including hosting an annual festival throughout the watershed. This event helps educate the public about the importance of the watershed and encourages community members to take an active role in its protection.

In addition, PRWC has leveraged funding in collaboration with partner organizations and private landowners to implement best land use management practices throughout the watershed. These efforts include restoring degraded areas that were experiencing elevated levels of phosphorus and E. coli, installing fencing to prevent livestock from accessing the river, reducing riverbank erosion, and planting native trees and vegetation. Collectively, these actions help stabilize streambanks, provide shade, and lower overall water temperatures, resulting in improved water quality and habitat conditions.

As Chair of the Provo River Watershed Council, I am grateful to work alongside dedicated and knowledgeable people who are committed to effective collaboration. Together, we strive to ensure the Provo River Watershed is managed in a way that supports a healthy environment and remains a vital resource—both today and for generations to come.

Joe Crawford, Watershed Programs Manager,  
Central Utah Water Conservancy District,  
Chair of the Provo River Watershed Council



Provo River in Summer, photograph courtesy of Provo River Watershed Council

The integration of water quality and climate data will provide valuable insight into how these parameters are impacting the reservoir and the surrounding environment. This information will also play a critical role in assisting the Division of Water Quality as they update to the Total Maximum Daily Load (TMDL) for Deer Creek Reservoir.



# COLLARS AND CANNONS: UNDERSTANDING TRUMPETER SWAN POPULATION DYNAMICS

Tracking the movements of migratory birds is essential for understanding their ecology, migration routes and habitat needs. One widely used method in modern avian research is the deployment of GPS tracking collars on large waterfowl, such as the trumpeter swan (*Cygnus buccinator*). To safely capture these birds for tagging, wildlife biologists use specialized capture techniques, including net cannons. The combination of careful capture methods and modern telemetry technology provides valuable data that helps guide conservation and management decisions.

## Connecting the continent: why movement data matters

Trumpeter swans are large, migratory waterfowl that breed primarily in arctic and sub-Arctic regions and winter across broad areas of North America. Their annual migrations can span thousands of kilometers, linking breeding wetlands in Alaska and northern Canada to wintering habitats across the continental United States. Understand-

ing movement is critical for protecting migration corridors, identifying key stopover sites and managing wetland habitats.

The current tagging project specifically examines the connection between the Great Salt Lake wetlands and the trumpeter swan populations in Yellowstone and the greater Rocky Mountain region. Understanding this relationship is critical to managing swan hunting in Utah.

## A legacy of management: Utah's hunting history

In 1962, Utah became the first state to introduce a legal swan hunt since the creation of the Migratory Bird Treaty Act of 1918. Currently, swan hunting is permitted in nine states. The initial goals of Utah's tundra swan (*Cygnus columbianus*) hunt were to prevent overgrazing of submerged aquatic vegetation in the state-owned waterfowl management areas and impounded wetlands, and ensure the birds completed their migration. Utah currently prohibits the harvest of trumpeter swans during the tundra swan hunt.

GPS collars are a cutting-edge tool that will provide important insight into swan population dynamics. Before the deployment of such devices, researchers must safely capture the birds. This is where net cannons come into play.

## Tools of the trade

Specialized net cannons are designed to launch a weighted net over animals from a distance. They are commonly used in wildlife research for capturing birds and mammals because they allow biologists to restrain animals quickly while minimizing injury and stress. The device works by firing small projectiles attached to the corners and leading edge of a net while the trailing edge is staked in place. When triggered, the projectiles propel the net forward, spreading it in the air so that it lands over the target animal or flock.

In February 2026, biologists with the Utah Division of Wildlife and USDA Wildlife Services captured and collared seven trumpeter swans. Net cannons and bait were deployed in open fields to capture the congregated birds. When the birds were in range, the fired net trapped them before they could take flight.



Preparing the net cannons, photo courtesy of the Division of Wildlife Resources





Trained field crews rush in to secure the birds and carefully remove them from the net, photo courtesy of the Division of Wildlife Resources

### From net to neck: the art of handling

Once captured, each swan was gently restrained by experienced personnel. Swans are large, powerful birds, so proper handling techniques are essential for both the birds' and the field crew's safety. Typically, one person secures the head and neck while another handles the wings and body.

Age and sex were recorded, an aluminum US Fish and Wildlife Service band was attached to the leg and the GPS tracking collar was fitted around the neck. Neck collars sit comfortably on swans' long necks without interfering with flight or feeding. Equipped with solar-rechargeable batteries, these collars record location data three times daily for up to five years.

Collars typically weigh a small fraction of the animal's body mass (less than 3%). The 3D-printed design of these collars ensures a lightweight, properly fitting unit that stays put and doesn't restrict movement or breathing. The removable locking door allows for fast and easy attachment of the collar. Responding quickly once the net is deployed prevents overheating, entanglement injuries and excessive stress.

### Mapping the journey

Once the swan is released, the GPS collar begins collecting location data. These devices record the birds' geographic location roughly every eight hours, store data onboard and transmit it via cellular networks when there's a strong network signal. Each record provides information about where the bird travels, how long it remains in an area and the routes it uses during migration.

This information is valuable for ecological research. Scientists can analyze the data to determine migration timing, identify key staging areas where birds rest and feed and examine how environmental conditions influence movement patterns. Over time, large datasets generated from tracking multiple birds allow researchers to develop detailed maps of migration corridors, habitat use, breeding locations and primary home range.

### Functional fusion of biology and technology

Capturing and collaring swans is powerful combination of field biology and modern technology. The net cannon provides a safe and efficient method for capturing these large waterfowl, while GPS telemetry allows researchers to monitor their movements across vast geographic areas. These



Kyle Stone and Trumpeter Swan, photo courtesy of the Division of Wildlife Resources

techniques enable scientists to gather critical information about migration patterns, habitat use and population dynamics.

As tracking technology improves, the insights gained from collared trumpeter swans will play an increasingly important role in protecting the wetlands, agricultural lands and migration corridors that these iconic birds depend upon. Through careful research and responsible wildlife management, biologists can ensure that trumpeter swan populations remain healthy and sustainable for generations to come.

Kyle Stone, Project Leader,  
Great Salt Lake Ecosystem Project,  
Utah Division of Wildlife Resources.



# HOW CITIES CAN SAVE WATER, SAVE \$MILLIONS, AND SAVE THE LAKE

*"Do the best you can until you know better. Then when you know better, do better"*

~ Maya Angelou

Five years ago, after decades working in water and engaged in Great Salt Lake, I was disheartened from little attention, traction and funding in our communities, media, and elected officials to recognize the benefits of the Lake to the state, and the dire need to change course of diversions depleting its life source. Many can relate. Today I am happy, relieved and extremely grateful the tide has turned. But I remain an optimist who worries a lot. There is much to be done and many things which could thwart the fragile balance of saving the Lake and ourselves from its demise.

First, I want to recognize and thank key partners who stepped up. The Lake's future has new hope with brilliant leadership, focus and action from Utah's legislature, Governor, state agencies, industry, institutions, agriculture, media and residents. It seems many are rowing together now, and recognize the effort required to navigate tricky waters to a healthy and vibrant future for the Lake, and our state.

Sandy, the city I work for, is proud our conservation efforts have made water available to shepherd to the Lake through the Great Salt Lake Water Enhancement Trust (GSLWET). Not only is our conservation helping the Lake, it saves \$10s to \$100s millions in future water costs over the long term. We hope that other cities will join us and seize the opportunity to save water, save money, and save the Lake.

## **"Decoupling" Growth from Water Demand**

Sandy development was limited by water we thought we needed when planning for growth in the 1980s and 90s. The City imposed a temporary development moratorium until water and infrastructure were secured by committing \$100s millions in water rights and joining Metro Water District of Salt Lake & Sandy.

In 2025, Sandy experienced a paradigm shift while updating our master plan for water supply and demand. Previous plans dating back 40 years had overestimated future water need to year 2025 by 30%, about 10,000 acre feet in savings. New technology, community awareness and conservation have resulted less water demand. Like most western cities, growth "decoupled" from increased water demand. This resulted in future savings of \$50M to over \$100M by reducing demands and downsizing projects with smaller pipelines, treatment plants, and storage tanks.

## **The Hidden Water Tax**

Cities leaders who insist or allow non-functional turf and other landscapes unsuitable for our desert climate have self-imposed a "hidden water tax" burden on their community. This has major impact on budget costs for cities, households, businesses, schools, and parks. It reduces growth potential and limits development, as well as affordable housing opportunities. The most expensive landscapes in a city are the ones we allow built today that we have to rip out in 10-20 years because there is not enough water.

Most tools needed are now in place for Cities to plan for decoupling up front, with huge savings in water, money, benefits to their communities, and the Lake.

First, the legislature and governor passed important laws and allocated meaningful funding to pay to save and send water to the Lake, compensating farmers, industry, institutions, and cities.

Second, new water technology and infrastructure save enormous amounts of water. But only if cities invest and help customers learn to use them effectively.

Third, communities are increasingly recognizing the benefits of smaller yards, eliminating non-functional turf, and appreciating the beauty of native landscapes.

Fourth, cities are seeing and planning for the reality of less water in the future as they update master plans. Once a realistic water "budget" is set, the math is easy. Greater conservation can increase housing affordability, development density—growth options become clearer, and the future realistic.

Fifth, Water Districts are coupling conservation with contract water. Some water districts require city water contracts to include commitments to conservation goals. This is very similar to the state required tiered conservation pricing for residential water customers. Central Utah Project contracts signed decades ago required water districts and cities like Sandy to commit to specific water conservation per capita water use goals. Fines for exceedance are significant, and dedicated to funding conservation within the community to lower water use until the goal is met. This policy internalizes the cost and benefit to cities in control of land use and other decisions that affect water use.

Sixth, we are improving efforts to assure low water use landscapes are attractive. Lousy looking landscapes don't sell well and are bad for conservation. Training, competency and performance guarantees for landscape designers, contractors, and maintenance companies are important to assure success in the eyes of the customer and community. Landscape code enforcement coupled with education resources go a long way as cities acknowledge the effort and growing pains needed to help owners learn to properly maintain a low water use landscape. Rebates and performance bonds create incentive to make and maintain a great landscape.

The point is now we know we will have to live with less water in the future from the Great Salt Lake watershed, and Colorado River. Droughts happen. Leaders at the state and local level can be the architects of a prosperous future with less water. The opportunities could not come at a better time to change our landscapes. Data across the country shows public demand growing for water wise landscapes and elimination of non-functional turf. When a new or existing homeowner installs a beautiful waterwise landscape that saves water and saves money, neighbors take notice and follow suit. Timing is perfect with the statewide need for lower water use and more affordable housing. These goals and opportunities align for change now.

Thomas Ward, P.E.,  
Director, Sandy City Public Utilities



# UTAH'S WATER OUTLOOK: POLICY WINS AND REMAINING CHALLENGES

We just closed out one of the driest winters in Utah history. As of March 1st, our statewide median snowpack sits at a meager 62%. It is more important than ever to reform the way we approach conservation and water use. With record-breaking spring temperatures ongoing and ski resorts closing early, we expect not only a dry summer but also a new low for Great Salt Lake this fall. While this summer will show why we need to do more legislatively, it is useful to take a holistic view and recall the important progress made in helping the Lake over the last five years.

In that time, the legislature has taken significant actions, including mandating and funding secondary water metering, requiring tiered water pricing to promote conservation, and limiting the water rights of mineral companies that extract water from the Lake. We have also allowed water rights to be dedicated specifically for conservation, a landmark shift in western water policy.

Those achievements would not be possible without bipartisan collaboration, including leadership from Speaker Mike Schultz, Majority Leader Casey Snider, Senator Scott Sandall, former Representative Tim Hawkes, and Former House Speaker Brad Wilson. Kudos are also owed to the dedicated public servants in the executive branch, including Governor Spencer Cox, who, by executive order, curtailed new groundwater extractions. Joel Ferry and the Department of Natural Resources, GSL Commissioner Brian Steed, State Engineer Teresa Wilhelmsen, GSL Watershed Enhancement Trust Director Marcelle Shoop, Director of Water Resources Candice Hasenyager, and Division of Forestry, Fire, & State Lands Director Jamie Barnes. Lastly, I want to thank FRIENDS of Great Salt Lake and other leaders in the non-profit sector for their unending work on behalf of the Lake.

This year, we have moved closer to rescuing the Great Salt Lake and investing in our water future. There has been an outpouring of support from community groups, including Great Salt Lake Rising, which recently announced a \$200 million public-private partnership. We have also made progress with new water policies. Specifically, I want to highlight three new laws in Utah that have equipped us with tools for preserving the Lake.

I sponsored H.B. 509, Wetland Study Amendments, which seeks to clarify the emerging regulatory gap around Utah's wetlands. This gap stems from the 2023 *Sackett v. EPA* decision by the U.S. Supreme Court, which largely precludes the federal Environmental Protection Agency from regulating intermittent or discontinuous wetlands.

As a result of this decision, federal protections are being withdrawn from thousands of acres of wetlands around Great Salt Lake. Wetlands are vital to maintain water quality, a home to vital biodiversity, and play a key role in migratory birds' survival.

These wetlands are pivotal to the health of Great Salt Lake

and other key water sources in our state, and the purpose of the legislation is to ensure Utah is prepared for the withdrawal of federal regulations. The bill requires the Department of Natural Resources to develop recommendations for wetland conservation and management, providing key insight into what our wetland ecosystems need moving forward. The legislature decided to fund the bill despite a tight fiscal year, showing their appetite to make sure key wildlife, hunting, and environmentally sensitive areas are not inadvertently lost.

Another bill that arms Utah with additional funding to acquire water leases and other projects beneficial to the Lake is H.B. 247 by Representative Ray Ward. This bill takes an existing tax, colloquially known as "the brine shrimp tax," and redirects it to an account dedicated to improving and acquiring water leases for Great Salt Lake.

The final water bill I want to highlight targets an emerging concern for Utah's water stability: data centers. As we grow increasingly dependent on artificial intelligence as a society, it's no secret that certain kinds of data centers are guzzling water. A standard-sized data center relying on evaporative cooling can use up to 300,000 gallons of water per day, with larger data centers using up to 5,000,000 gallons per day.

Representative Jill Koford sponsored legislation, H.B. 76, requiring data centers to report their water usage so the public can see how much water they use. The bill allows for public accountability, paves the way to incentivize or require closed-loop cooling systems, and is a great first step on a major new issue.

Despite these new tools and the other water successes from this and previous legislative sessions, we still need additional action to meet the needs of Great Salt Lake. The most significant policy gaps concern conserving water used on landscaping, dedicating conserved flows to the Lake, and appropriating money to lease or otherwise acquire water for the Lake. This year, we saw many important efforts to address these gaps fail to pass, including Representative Clint Okerlund's bill, which would have limited overhead spray irrigation for landscaping in new commercial construction. We also need greater efforts to nationalize protection for Great Salt Lake. To that end, I am glad that Governor Cox raised the issue of the Lake to the President.

Going forward, I'm hopeful that we can effectively regulate water usage in municipal landscaping, energy and technological developments, and promote conservation in the agricultural sector. The issues threatening the Lake are within our control, and I am confident that through effective policy changes and collective effort, we can get there.

Representative Doug Owens,  
Democrat, District 33



## **The Spring Flood (from Antelope Island)**

In the beginning, gray clouds huddle and weep as  
the heavy sky drapes like a coarse wool blanket across the island.  
Lazy wind is punctuated  
by thunder-claps and flashbulb lightning.  
The hills hold on to the last of their northside snow.  
Sage plants open their silver green leaves in devotion  
as desert soil hungrily swallows the storm.

Days into the rains, rock ledges start to swell  
and litter rolling boulders down the hillsides.  
All the birdsong becomes amplified.  
Waves kick up on Great Salt Lake and water laps  
at the causeway.  
The road workers retreat to the mainland  
taking their orange cones with them.

Meanwhile, in the city, a biologist casts a warning  
into the legislative abyss and is escorted off the premises.  
Playgrounds become water parks where  
children face off with ducks for dibs on the monkeybars,  
snails climb for higher ground  
and the city squirrels hastily recache their peanuts.

It keeps raining.  
On the island, coyotes whelp pups who wriggle and yip  
and quickly learn to shake water from their thick coats.  
Bison gather to discuss the memory of swimming  
and physics of buoyancy.  
In the shallows, brine shrimp bloom in the changing salinity.  
Antelope race in hydroplane ecstasy across the low meadows.

Behind the clouds, the sun makes a bid for exposure.  
Meteorological haggling at the highest levels increases the chaos.  
The rain turns to a torrent and for two days  
and even the gulls need to squint through cataract visibility.  
The shadows of the paleolake emerge at the edges of the landscape,  
an open time capsule.  
A memory we have lost.

—Johanna Greenberg

### About this Poem:

*Having spent many days wandering around Antelope Island, I've been lucky to observe the wealth of plants and animals, and weather of the place. This is a poem which imagines a great spring flood from Antelope Island.*

Featured during the 2024 Alfred Lamboune Arts Program



# GREAT SALT LAKE MAP



Basemap: USGS. Water level shown depicts approx. 4189'. For reference only.

Great Salt Lake historic average elevation 4,200' (1847-1986).
  Approximate average elevation Fall, 2022 4,189'.

This map shows the contrast between the historic elevation average of 4,200' (1847-1986) and the current elevation of 4,189' (Fall 2022). It shows that islands, bays, habitat values, navigation and open water have been lost/compromised due to a declining elevation.



# ALIGNMENT AND THE GREAT SALT LAKE HEDGEHOG

In 2001, Jim Collins wrote the popular corporate strategy book, *Good to Great*. *Good to Great* identifies key principles for companies seeking to achieve sustained, long-term success, arguing that "good is the enemy of great" due to complacency. Through a five-year study, Collins found that greatness isn't luck, but a result of conscious choices focusing on concepts like Level 5 Leadership (humble and determined leaders), the Hedgehog Concept (focusing on what you can be the best at), a culture of discipline, and the Flywheel Effect (cumulative momentum).

These attributes of greatness are equally as applicable to the challenges we face with Great Salt Lake as they are in a corporate setting. In my years of conducting stakeholder engagement related to the Great Salt Lake watershed, I've learned that if we parse out all our needs and issues, it feels as though we have two paths that lead to systemic change: 1) Leaders step up and lead of their own accord and make hard management and infrastructure decisions, or 2) The system fails and the failure forces leaders to step up and lead and make hard management and infrastructure decisions. How do we help leaders to make these hard management and infrastructure decisions before we reach system failure?

I'd like to focus on two Collins findings: the Hedgehog Concept and the Flywheel Effect. Both are principles that can be applied immediately, and I believe can have a profound impact on our shared interests to benefit the Lake.

## The Hedgehog Concept

The Hedgehog Concept is a strategic framework for achieving exceptional, long-term success by focusing on one core, simple idea. It requires clarity at the intersection of three overlapping circles: 1) What are you deeply

passionate about? 2) What can you be the best in the world at? 3) What drives your economic engine?

During 2025, a delegation of water folks from Utah toured some saline lake systems in Nevada that have been engaged in watershed collaboration for many years. When asked what brought diverse stakeholders together in these systems, the Nevadans pointed to one key focus: create (or restore) healthy trout fisheries. A healthy fishery is visual: people can picture what a healthy fishery looks like, people with different interests can be deeply passionate about fishery health, and it can help drive the local economy. The hedgehog concept of a healthy fishery represented enough shared vision and values that stakeholders were able to focus, transcend past differences, and get work done.

Our challenge with Great Salt Lake is that we don't have a fishery or similarly visually compelling idea to represent our hedgehog concept the way these other saline lake systems do. Brine shrimp, for example, are an incredibly important part of our system, but they are not sexy. I believe that we can, however, find a different hedgehog concept for Great Salt Lake. In my experience with watershed councils and other place-based collaboratives, their success depends on not trying to be everything to everyone. Rather, they need to find what they can focus on, what they are deeply passionate about, what they can be the best at, and what drives funding and support. I was part of a watershed council in another western state focused on monitoring, restoration, and education. That was it. With that simple focus, they have been highly successful in securing funding and knocking out projects for over 25 years.

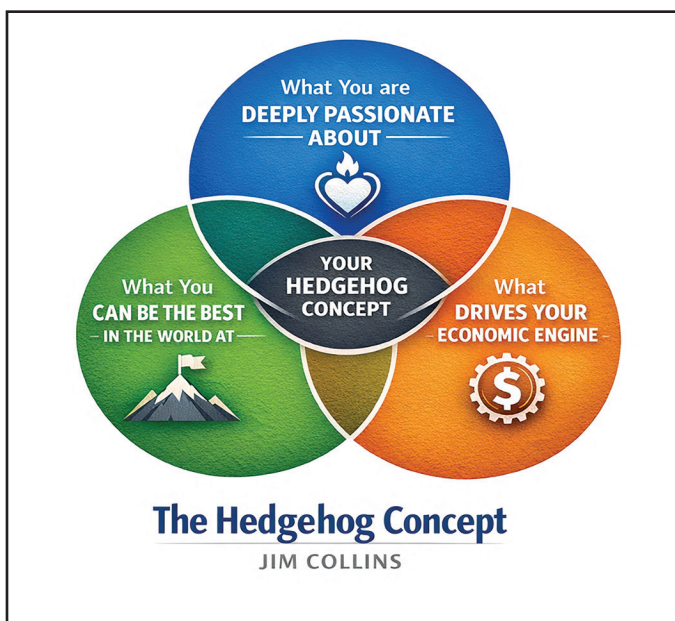
To achieve the same success here, the question we need to be asking ourselves is, "What is our hedgehog concept for Great Salt Lake?"

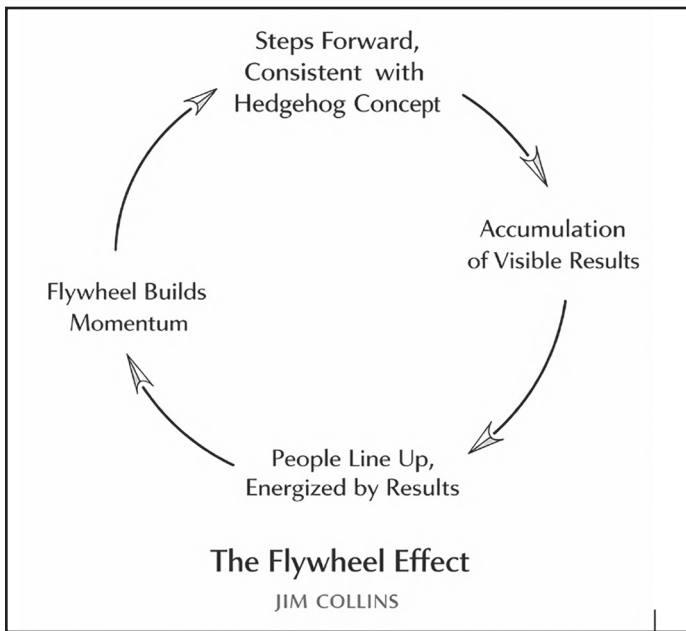
## The Flywheel

The flywheel is a concept that explains how companies achieve long-term success through the accumulation of small, consistent wins. Rather than relying on a single "miracle moment" or grand innovation, greatness is built by relentlessly pushing a heavy wheel in one direction until it gains unstoppable momentum.

There are numerous ways we can apply the flywheel concept to Great Salt Lake. Within the watershed, there are already many different organizations and people pushing their proverbial flywheel. Unfortunately, it could be argued that because these organizations all have different hedgehog concepts, they may be accidentally pushing their flywheels against each other instead of in the same direction.

To solve this issue, we can organize through place-based





collaboratives to align our individual flywheels. Alignment is always the precursor to effective change management.

Two examples of the hedgehog concept and fly wheel effect in the Great Salt Lake watershed are the East Canyon Watershed Committee and the Provo River Watershed Council. By defining their hedgehog concept, accumulating visible results and successfully telling their story, they inspire other people to engage in and support their work. The more they do and the more they tell their story, the more they build momentum and gain funding and support.

The Provo River Watershed council was formed nearly 30 years ago to tackle total maximum daily load (TMDL) issues, and although they conquered their TMDL issues years ago, they have continued to this day because of the council members' ability to work together and deliver small, consistent wins. The East Canyon Watershed Committee is jointly funded by two state agencies (Utah Division of Water Quality and Utah Department of Agriculture and Food) and is a great example of what can happen when local and state agencies can partner and share resources.

Both the East Canyon Watershed Committee and Provo River Watershed Council have local convenors who provide consistency, leadership, and manage the organizational needs of these place-based collaboratives so the flywheels are able to move by involving key stakeholders, identifying and prioritizing projects, securing resources, delivering projects, telling the stories of their successes, and using gained momentum to generate more.

### Momentum and Great Salt Lake

So how do we apply these two concepts to build on what we already have? How do we replicate the success

of smaller place-based collaboration at the scale of the Great Salt Lake watershed?

One simple move we can make is to fund and support our existing watershed councils. During 2020, the Utah Legislature passed the Watershed Councils Act (HB 166), which authorized and directed the Division of Water Resources to create the Utah Watersheds Council (a state council) and twelve local watershed councils. The twelve local councils include the five watersheds that comprise the Great Salt Lake watershed (West Desert, Bear River, Weber River, Jordan River, and Utah Lake) as well as a Great Salt Lake watershed council.

The act's intent is to develop diverse and balanced stakeholder forums for discussion of water policy and resource issues at watershed and state levels. The watershed council format in Utah is designed for local councils to communicate their needs up to the Utah Watersheds Council (statewide council), which then communicates those needs up to the Utah executive and legislative levels. With an informed governor and legislature, we can have better policy and better support from resources generated by executive and legislative action. This all contributes to the momentum building of the flywheel because we all push the flywheel in the same direction. But forums for discussion are not enough. These councils need focus (hedgehog concept) and funding so they can achieve long-term success through the accumulation of small, consistent wins (projects) that deliver visible results, which engage the community and earn the councils more funding and resources.

Support for Utah's watershed councils can mirror other western states, whose councils receive funding to help with staffing and basic needs—allowing the watershed council to pursue additional funding sources that support their hedgehog concept. With their basic needs covered, watershed councils will be able to not only fulfill their roles as forums for discussion and policy advisors, but implement real, on-the-ground change that brings people together and aligns flywheels throughout the Great Salt Lake watershed.

The ability to deliver projects is both the problem and the solution for a resilient Great Salt Lake. People are tired of just talking about the Lake; they want to know what is expected of them and what they can do to help solve the problem. Planning and environmental studies without purpose or visible results lead to fatigue and frustration—and that leads to stagnation and litigation. By engaging in real projects together, we build trust, capacity, and real momentum that translate into real results—and that leads to satisfaction and community. The flywheel keeps on turning. Together we will see a healthy Great Salt Lake.

Dan Adams, Consultant,  
The Langdon Group, Inc.



# A GLARING EXAMPLE OF A LOST POSITIVE FOR UTAH'S TRANSPORTATION FUTURE

If you do what you've always done, you'll get what you've always gotten.



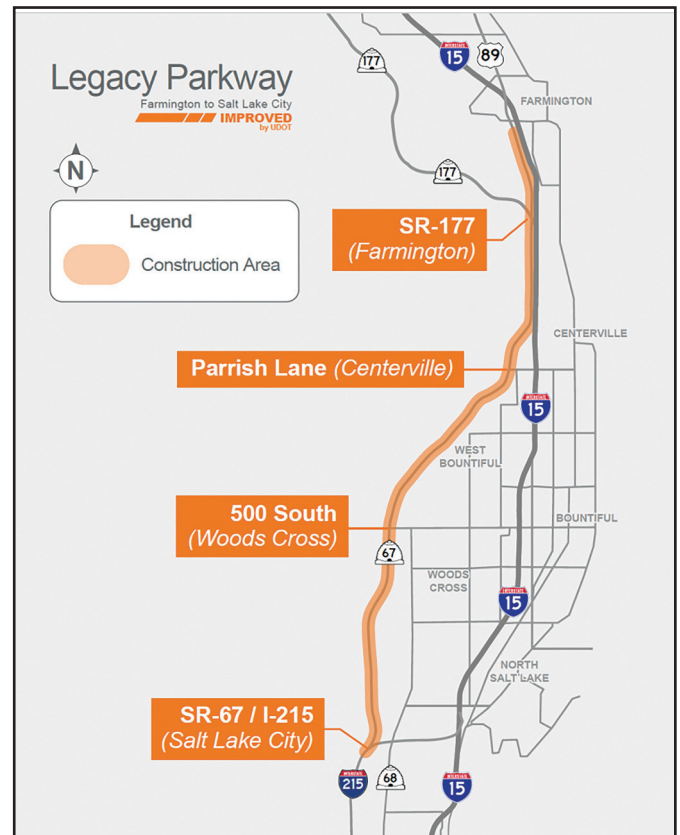
Legacy Parkway Construction Announcement, [udotinput.utah.gov](http://udotinput.utah.gov)

And that's exactly what the Legacy Parkway construction update is telling us. The Utah Department of Transportation (UDOT) has proposed an expansion of two additional lanes on the Legacy Parkway to absorb traffic from I-15 during the proposed freeway widening from Farmington to Salt Lake City to "meet" the "predicted" automobile traffic "volumes" in 2050. This expansion will turn Legacy Parkway into a 6-lane highway with severe impacts on the surrounding area, the Legacy Trail and adjacent parks; it will undermine its designation as a Utah Scenic Byway, and create noise and other externalities on the Legacy Nature Preserve and Great Salt Lake.

Why is this even an option when UDOT is underway with a project to implement strategic double tracking of FrontRunner that will allow 15-minute service at peak demand times? The FrontRunner 2X project is scheduled to be completed in 2030. If UDOT is going to widen I-15, it would be a perfect opportunity to introduce frequent, reliable and free FrontRunner service during construction and introduce residents to a preferred travel alternative that would diversify transportation options for our growing population.

On October 10, 2025, FRIENDS of Great Salt Lake, Utahns for Better Transportation (UBET), HEAL Utah, Angie Keaton (a Foxboro community organizer), and many others submitted comments to the Utah Department of Transportation on the Legacy Parkway State

Environmental Study (SES) opposing the fast track widening of the parkway. But here we are once again with outdated thinking that is still driving proposals to add more lanes to highways in an attempt to "solve" automobile congestion that widespread evidence has shown doesn't work. No matter how many lanes are added, induced automobile traffic will fill them. Back to those key words "meet," "predicted," and "volume."



Legacy Parkway construction area through end of 2026, [udotinput.utah.gov](http://udotinput.utah.gov)

Let's take a moment and step back in time to 1996. This is when Utah Governor Michael Leavitt proposed building a new 120-mile long freeway—the Legacy Highway—from Brigham City to Payson along the western edge of Wasatch Front communities. The first 14-mile segment to be built was in Davis County from Farmington to Salt Lake City, which would destroy at least 114 acres of wetlands along the flyway and the eastern shore of Great Salt Lake,





Community advocacy yard sign, photograph courtesy of Roger Borgenicht

impact adjacent communities, farmlands, and land uses, and continue with transportation practices that exclude investments in transit or trail options.

Determined to counter Leavitt's "vision," Salt Lake City, Sierra Club, UBET, and FRIENDS mounted a campaign to Stop the Legacy Highway and promoted a shared solution to meet future travel demand by implementing a better balanced transportation investment program that prioritized investments in convenient reliable transit networks, improvements to existing roadway operations, separated and connected bikeways, and pedestrian safety improvements.

With increased public opposition and numerous legal challenges, a September 16, 2002 decision by the 10th Circuit Court of Appeals forced a re-evaluation of the project's impact on wetlands, alternative routes and sequencing of investments in the Shared Solution. It created a multi-year delay that led to a settlement agreement in 2005 that was responsible for the genesis of the Legacy Parkway.

The settlement allowed construction to proceed in exchange for strict environmental and

operational restrictions. These included a slower speed (55mph) parkway without semi-trucks or billboards, quiet pavement, dark skies lighting, a fully off road bikeway with educational kiosks, the creation of a 2,100 acre Legacy Nature Preserve, and investments to purchase ROW for initiation of Wasatch Front regional rail, FrontRunner.

For over 75 years, community design and transportation investments have been focused almost exclusively on promoting and accommodating the automobile. The development of viable transportation choices – how we get from here to there – has become more varied in recent years. Fortunately, forward thinking community design and transportation infrastructure investments have begun to focus on safe bikeways, walkable town centers and reliable, convenient transit.

It's simply unfortunate that the Legacy Parkway is a lost positive in this context.

Roger Borgenicht, Co-chair,  
Utahns for Better Transportation.





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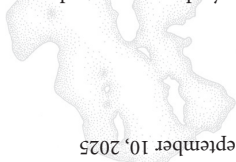
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Submit articles and  
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LAKE FACT:  
Q: When did US Magnesium LLC  
file for Chapter 11 bankruptcy?



A: September 10, 2025

# THANKS FOR MAKING A DIFFERENCE

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# MAKING A DIFFERENCE

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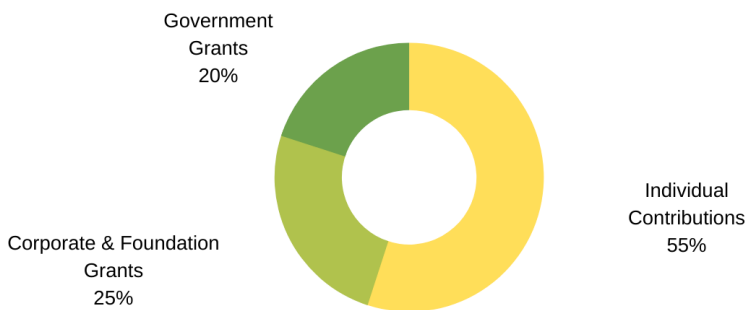
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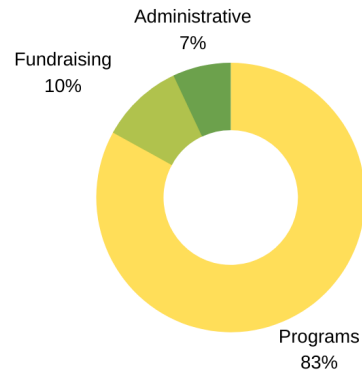
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*Great Salt Lake And The Miracle of The Seagulls,*  
 acrylic painting by Gisele DaSilva  
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