Great Salt Lake Resolution (HCR-10) Steering Group

Recommendations to Ensure Adequate Water Flows to Great Salt Lake and Its Wetlands

Final

December 2020

Executive Summary

Water levels in Great Salt Lake—the largest saline lake in the Western Hemisphere--are in decline, threatening billions of dollars in economic activity, a globally important ecosystem, local public health, and other critical values that the lake supports, including the lake's essential contribution to Utah's water cycle through lake effect precipitation.

As the threat to those values has grown, public concern about the lake and its dwindling water supplies has increased. In 2019, the Utah Legislature passed, and Governor Gary Herbert signed, HCR10 – "Concurrent Resolution to Address Declining Water Levels of the Great Salt Lake" ("HCR-10" or the "Resolution"), recognizing *"the critical importance of ensuring adequate water flows to Great Salt Lake and its wetlands to maintain a healthy and sustainable lake system."* Fortunately, at current levels the lake continues to sustain many of its beneficial uses. HCR-10 recognizes, however, that we cannot take those lake levels or the values they sustain for granted. The enormous economic, environmental, and human health costs associated with the loss or degradation of terminal lake systems around the globe—including the Aral Sea, Lake Urmia, Owens Lake, and many others—teach us that serious harms can and will occur if the lake continues to decline, and we need to avoid those outcomes by planning ahead and working together. As the Resolution states: "*by taking steps now, Utah will be best-positioned to avoid the kind of degradation and economic harm experienced by other states [and] communities.*"

To facilitate that kind of long-term planning, the Resolution encouraged the Utah Departments of Natural Resources and Environmental Quality to engage with a diverse group of stakeholders to consider and make recommendations on how to ensure adequate water flows to the lake. That is a monumental task made even more challenging by prolonged drought, a changing climate, and increasing upstream water demands driven by Utah's rapid population growth and booming economy.

Figure ES-1. Focus Areas Identified to Ensure Adequate Water Flows to Great Salt Lake and its Wetlands

In response, those agencies convened a group of stakeholders (the "Steering Group"), including agency staff, experts in water law and municipal and agricultural water supply, agricultural producers, environmental conservation and outdoor recreation interests, and representatives of industries that rely on the lake. The report that follows presents 16 Strategic Opportunities identified by the Steering Group, along with 60 specific recommendations that address those opportunities (Table ES-1). The Strategic Opportunities are organized into six focus areas (Figure ES-1): the need to (1) educate and engage stakeholders; (2) improve information and decision-making; (3) optimize agricultural water use; (4) optimize municipal and industrial (M&I) water use, and connect water and land use planning; and (5) refine legal and policy options that support protecting water supplies to the lake. The final recommendation (6) recognizes the need to find sustainable ways to fund and otherwise sustain those efforts over time.

Managing Utah's water supplies cannot be approached as a "*zero-sum game*." Instead, strategies for sharing finite water supplies in ways that support multiple uses is vital for sustaining Utah for generations to come.

There is always a temptation when thinking about water supply to reduce it to a zero-sum game. Water is, after all, a finite resource, particularly in a dry state like Utah. In that restrictive framework, however, water for the lake can only come at the expense of something else. That way of thinking threatens to pit those who support and recognize the need for preserving Great Salt Lake and its wetlands against those who fear that doing so will threaten what they value.

The Steering Group's recommendations by-and-large reject an "either/or" construct in favor of strategies that share finite water supplies in ways that support multiple uses. For example, Strategic Opportunity #7 calls on state and federal agencies to "leverage existing programs to optimize the use of water in ways that benefit both agriculture and Great Salt Lake." Such solutions require creativity and often outside funding, but successful examples of such innovations abound, particularly as states in the Interior West experiment with new ways to stretch limited water resources. Consequently, even as the report calls on stakeholders to protect the lake's water supplies, the recommendations fully recognize the need to avoid harm and protect existing water rights. For example, Strategic Opportunity #8 supports maintaining and conserving working agricultural lands linked to the Great Salt Lake Ecosystem, given the important relationship between current irrigation practices and agricultural return flows that benefit the lake and the wildlife that depend on it.

> A "first do no harm" approach should be implemented to leverage science to manage risk and make more informed and forward-thinking decisions.

This report also recognizes that finding ways to integrate water planning and land-use decisions is essential. (See Strategic Opportunity #10). Historically, land use decisions do not take into account the impact that a particular development or pattern of development may have on either water demand or water infrastructure. Cumulatively, this can have negative long term and cascading impacts to Great Salt Lake levels and health. The recommendations suggest finding better ways to make sure that decision-makers bridge that gap. A separate recommendation calls for stakeholders to better understand and grapple with how shifting patterns of land use affect the lake itself. (See Strategic Opportunity #11.) These deliberative strategies are important in linking state and local land use and water resource policies that are often developed out of context with one another and the lake itself.

The report acknowledges that optimizing the way we use water could benefit Great Salt Lake levels. Strategic Opportunities #7 and #8 address agricultural water uses, while Strategic Opportunities #9 and #10 address municipal and industrial water use. Changing Utah's water use habits is key to maintaining water flows to Great Salt Lake. By optimizing Utahns' water use, it may be possible to delay or forestall major public water development projects, which would benefit lake levels and save taxpayer money.

A large number of recommendations emphasize the need to study or pilot different water management approaches to ensure we understand the implications of changing the ways in which water is used and shared. Recommended studies also serve to provide the data and analyses needed to inform and improve planning and decision-making that takes into account water flows for Great Salt Lake. Examples of such recommendations include the following: coming up with an overall water budget and water depletion analysis for the Great Salt Lake watershed under differing scenarios that include a changing climate; piloting cost-effective telemetry and measurements; assessing water reuse scenarios and impacts; updating groundwater and shallow aquifer studies near Great Salt Lake; and completing a study of agricultural lands in the vicinity of Great Salt Lake to assess their importance to return flows that benefit Great Salt Lake and its wetlands.

While a number of concepts addressed in this report have been touched on in other efforts, including the 2017 Recommended State Water Strategy, the Steering Group intends the recommendations in this report less as ends in-and-of-themselves than as catalysts to spark continuing conversations, studies, and thoughtful decision-making. It will take a coordinated and committed effort from many stakeholders over time to find workable solutions. Fortunately, Utah has a proven track record of taking the long view and working together to solve seemingly insurmountable problems -- a characteristic drawn from Utah's pioneer legacy. We must tap that same pioneer spirit to have any hope of solving a challenge as big as saving Great Salt Lake. We owe it to ourselves and to those who will call Utah home for generations after us to find a way to accomplish that.

> The Steering Group intends the recommendations in this report…as catalysts to spark continuing conversations, studies, and thoughtful decision-making.

Table ES-1. Strategic Opportunities to Ensure Adequate Water Flows to Great Salt Lake and its Wetlands

Educate and Engage	
1	**Find Ways to Help the Public and Decision-makers Connect with Great Salt Lake** *Sustained education and engagement of the public and decision-makers will help foster a spirit of cooperation and strengthen community support for the actions and funding needed to ensure protection of Great Salt Lake and its wetlands.*
2	**Create a Great Salt Lake Framework to Improve Coordination Among Governmental Entities and Other Stakeholders** *Coordinating decisions and actions across the watershed will minimize costs and maximize benefits to Great Salt Lake and its wetlands.*
Improve Information and Decision-Making	
3	**Better Measure Water Resources in Cost-effective Ways to Optimize Their Use** *Utah must continue to improve measurement and metrics to understand how best to manage its water resources and the trade-offs associated with shifts in water use over time.*
4	**Agency and Other Decision-makers Should Account for Impacts to Great Salt Lake when Planning and Making Decisions that could Impact Great Salt Lake** and its Wetlands *Effort must be made to find ways to ensure that decision-makers understand how the decisions they make affect the lake in positive or negative ways and make sure that those effects inform their short and long-term planning and decision-making. To ensure the best use of limited resources, this will require agencies to work together to develop long-term and coordinated planning for actions that affect Great Salt Lake and its surrounding wetlands.*
5	**Develop an Integrated Strategy to Navigate Longstanding Legal and Policy Issues** *Preserving adequate flow for Great Salt Lake and its wetlands will require coordination and integration of water policy and strategies across water utilities and basins within the Great Salt Lake watershed.*
6	**Close Data Gaps in Baseline Condition of Water Flow to Great Salt Lake and its Wetlands** *A "first do no harm" approach should be implemented to leverage science to manage risk and make informed and forward-thinking decisions.*
Optimize Agricultural Water Use	
7	**Leverage Existing Programs that Optimize the Use of Water in Ways that Benefit Both Agriculture and Great Salt Lake** *Existing State and Federal program criteria could be better utilized and revised in ways that improve incentives for agricultural producers to optimize the use of their water. Connecting those programs to water supplies for Great Salt Lake could help expand the programs and make them more sustainable over time.*
8	**Where Possible, Maintain and Conserve Working Agricultural Lands Linked to the Great Salt Lake Ecosystem (to Preserve Return Flows)** *Protecting "at-risk" agricultural lands presents an opportunity to also protect Great Salt Lake and its wetlands.*
Optimize Municipal and Industrial Water Use and Land Use/Water Planning	
9	**Ensure that Water Planning Informs Land Use Decisions** *Because we cannot sustain growth in Utah without water, water planning must become an integral part of land use planning and economic development.*
10	**Find Ways to Use Less Water on Urban and Suburban Landscapes** *Metering secondary water, reducing the amount of turf, avoiding watering during the day, drip irrigation, and other strategies can reduce infrastructure costs, stretch water supplies, and help sustain Great Salt Lake and its wetlands over time.*
11	**Fully Understand How Land Use Changes Affect Water for Great Salt Lake and Better Manage Those Changes to Benefit the Lake** *Changes in land use affect the lake in different ways. To preserve the lake, we need to understand those effects and what they mean for the lake and its future.*

Refine Legal and Policy Options

12 Fully Explore How to Protect Water Supplies for Great Salt Lake Using Existing Legal Authorities
Existing laws, authorities, directives, and policies may provide important, but under-utilized ways to benefit Great Salt Lake.

13 Fully Explore the Idea of Depletion-Based Models to Promote the Optimal Use of Water
Utah should continue investigating depletion-based models that may provide water rights holders with meaningful incentives to reduce depletion and that take into account existing water rights.

14 Fully Explore how Principles of Prior Appropriation can Incentivize Efforts to Decrease Current Depletion Levels While Protecting Existing Rights
Promote flexibility and find new incentives to optimize water use and sustain healthy lake levels while protecting existing water rights.

15 Explore New Statutory Authorities that Incentivize the Optimal Use of Water Resources and Allow Water Rights to be Used to Support Great Salt Lake
We must identify new strategies and utilize existing authorities to augment water supplies to the lake and its wetlands while taking into account existing upstream water rights.

Sustain Efforts Over Time

16 Identify Innovative and Sustainable Funding Sources to Ensure Adequate Water Supplies for Great Salt Lake
New and sustainable methods should be sought to fund programs and other efforts to preserve Great Salt Lake and its wetlands.

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A Concurrent Resolution to Address Declining Water Levels of the Great Salt Lake
B Key Challenges in Ensuring Adequate Water for Great Salt Lake and Its Wetlands
C Initial Ideas for Ensuring Adequate Water For Great Salt Lake and Its Wetlands

Acronyms and Abbreviations

Ag Task Force	Agricultural Water Optimization Task Force
DFFSL	Division of Forestry, Fire & State Lands
DWQ	Division of Water Quality
DWiR	Division of Wildlife Resources
DWRe	Division of Water Resources
DWRi	Division of Water Rights
GSLAC	Great Salt Lake Advisory Council
HCR-10	House Concurrent Resolution 10
M&I	Municipal and Industrial
Steering Group	Great Salt Lake Resolution (HCR-10) Steering Group
UDEQ	Utah Department of Environmental Quality
UDNR	Utah Department of Natural Resources

1. The Challenge

We have been given an incredible water legacy. Our predecessors saw a vision of what this land could become and then laid the groundwork to make that vision a reality. With ingenuity, foresight, and a spirit of cooperation, they worked and sacrificed to both overcome the challenges they faced and leave a lasting water legacy for future generations.

They succeeded!

Water Has Been Critical to our Growth

Utahns today enjoy a safe, bountiful, and relatively inexpensive supply of water that fuels our economy, supports our standard of living, and benefits all who call, or will call, this place home.

Having received such a legacy from our forebears, we must consider the legacy that we will leave to future generations. Rapid growth, an unpredictable climate, and ever-increasing demands for a finite supply of water pose new and difficult challenges that must be addressed with the same vision, determination, and spirit of cooperation that animated those who first settled here. One key piece of that challenge involves Great Salt Lake. Long out-of-sight-and-out-of-mind for many Utahns, we are slowly beginning to realize the value of this salty, inland sea to Utah's economy, environment, standard of living, and even the health of its citizens. Finding effective ways to preserve the lake in ways that do not threaten existing users or curb natural growth presents a generational challenge that will test Utahns proven ability to solve hard problems. In short, how do we ensure that this vital natural resource becomes a part of our own water legacy to future generations? How, in the face of so many challenges, do we maintain "a healthy and sustainable lake system" that enables the future we envision?

This is the challenge that the Utah Legislature highlighted in 2019 through House Concurrent Resolution 10, *Concurrent Resolution to Address Declining Water Levels of the Great Salt Lake* (HCR-10, see Attachment A). HCR-10 clearly outlined the purpose, the need, and the objective for this Great Salt Lake Resolution (HCR-10) Steering Group (the Steering Group). This document summarizes the Steering Group's report and recommendations on how best to ensure adequate water flows to Great Salt Lake and its wetlands.

1.1 Purpose

HCR-10 describes the Global, Regional and Local significance of Great Salt Lake and its wetlands. The lake provides essential minerals for the U.S. and world economies, including sulfate of potash, an important fertilizer for fruit and nut crops; magnesium, used in everything from high tech medical devices to soda pop cans; and rare minerals like titanium and lithium, the latter of which plays an essential role in green technologies like rechargeable batteries. Brine shrimp cysts harvested in a sustainable way from the lake provide an essential feed for shrimp and fish farms around the world, helping to feed the world's growing human population. The lake also provides an essential stopover and feeding grounds for millions of migratory birds, some of which travel to places as far away as Alaska and Argentina. The lake's waters help fuel the snowpack that we tout as the "Greatest Snow on Earth." It keeps dust down, helping to protect the health of those who live nearby. It also inspires local painters, photographers, bikers, and the many who recreate each year on Antelope Island, sail on its waters, hunt waterfowl in its wetlands, or otherwise appreciate its immense natural beauty.

HCR-10 describes the observed fluctuations in Great Salt Lake water levels and the potential risks to Utah if Great Salt Lake water levels are to continue to decline. How can Utah "avoid the kind of degradation and economic harm experienced by other states or communities" with "closed basin lakes that have experienced excessive drying" (HCR-10 2019)?

1.2 Need

From HCR-10: *"NOW, THEREFORE, BE IT RESOLVED that the Legislature of the state of Utah, the Governor concurring therein, recognize the critical importance of ensuring adequate water flows to Great Salt Lake and its wetlands, to maintain a healthy and sustainable lake system.*

BE IT FURTHER RESOLVED that the Legislature and the Governor recognize there is a need for an overall policy that supports effective administration of water flow to Great Salt Lake to maintain or increase lake levels, while appropriately balancing economic, social, and environmental needs, including the need to sustain working agricultural land."

1.3 Objective of the Steering Group

From HCR-10: *"BE IT FURTHER RESOLVED that the Legislature and the Governor encourage the Departments of Natural Resources and Environmental Quality through their relevant divisions to expeditiously, jointly, and collaboratively* ***engage with a wide-range of stakeholders to develop recommendations for policy and other solutions to ensure adequate water flows to Great Salt Lake and its wetlands.***

BE IT FURTHER RESOLVED that the Legislature and the Governor encourage the ***presentation of findings, conclusions, and recommendations to the Legislature and Governor****, including encouraging a report of progress in achieving the objectives of this resolution to the Natural Resources, Agriculture, and Environment Interim Committee by no later than November 30, 2020* (emphasis added)."

2. The Great Salt Lake Resolution (HCR-10) Steering Group

All Utahns have a stake in Great Salt Lake - particularly those who live, work, and use water within its watershed. Their concerns, ideas, and opinions are diverse, complex and vital to any lasting solution for the lake and its future. The Steering Group was formed in January 2020 to begin shaping those ideas into the thoughtful and practical recommendations described in this report. The Utah Department of Natural Resources (UDNR) and Utah Department of Environmental Quality (UDEQ) identified and brought together key experts and stakeholders representative of diverse interests and familiar with the challenges and opportunities in managing and using water within Great Salt Lake and its watershed. Those Steering Group members included the following:

- Todd Adams/Utah Division of Water Resources (DWRe) (Candice Hasenyager *)
- Nathan Bracken/Smith Hartvigsen, Water Law
- Laura Briefer/Salt Lake City Dept. of Public Utilities, Municipalities, Water Supplier (Tamara Prue*)
- Brian Cottam/Utah Division of Forestry, Fire & State Lands (DFFSL) (Jamie Barnes*)
- Lynn DeFreitas/FRIENDS of Great Salt Lake, Conservation
- Justin Dolling/Waterfowl
- Joel Ferry/Agriculture, Legislature
- Tage Flint/Weber Basin Water Conservancy District, Water Supplier (Darren Hess*)
- Mike Fowlks/Utah Division of Wildlife Resources (DWiR) (Eric Edgley *)
- Erica Gaddis/Utah Division of Water Quality (DWQ) (John Mackey*)
- Jim Harris/Utah DWQ – co-chair, non-voting (Jake Vander Laan*)
- Joe Havasi/Compass Minerals, Mineral Extraction
- Tim Hawkes/Great Salt Lake Brine Shrimp Cooperative, Legislature
- Tyson Roberts/Agriculture Producer
- Marcelle Shoop/National Audubon Society – Saline Lakes Program, Conservation (Max Malmquist – technical support)
- Brian Steed/UDNR, Director, non-voting
- Mark Stratford/Ogden City, Municipalities, Utah League of Cities and Towns
- Laura Vernon/Utah DFFSL- co-chair, non-voting
- Teresa Wilhelmsen/Utah Division of Water Rights (DWRi) (Jared Manning*), non-voting
- Jody Williams/Holland & Hart, Bear River Commission

*Alternate

Funding for this effort was generously provided by the Great Salt Lake Advisory Council (GSLAC). Jeff DenBleyker of Jacobs Engineering Group Inc. served as project manager and facilitator.

3. Background

The Steering Group acknowledges that this document does not stand alone when it comes to ideas or strategies on how to address water flows to Great Salt Lake. It is important to note at the outset recent actions taken by the Legislature, the Governor and the GSLAC that may have application to the lake and the issues that the Steering Group was directed to address.

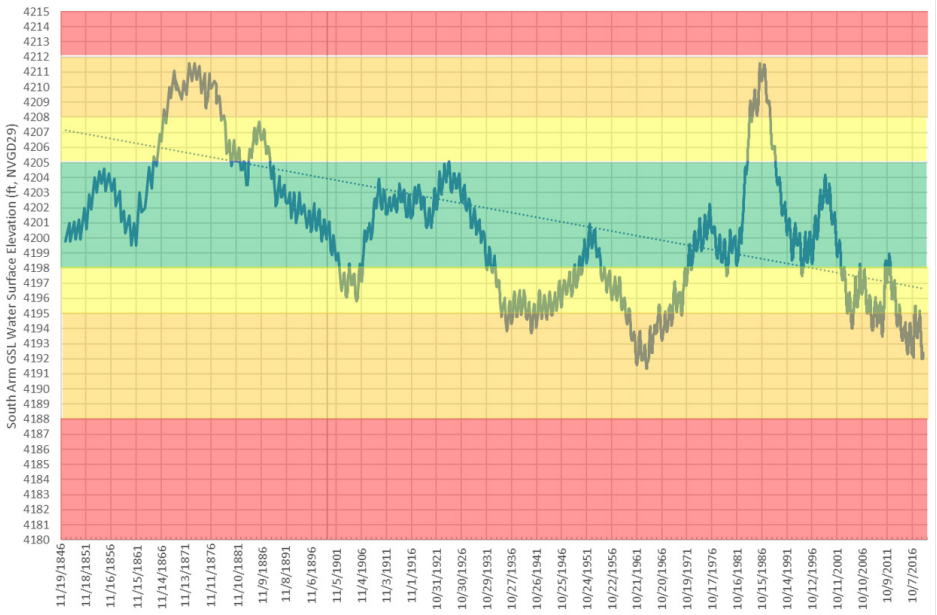
New Salt Flats on Exposed Lakebed near Fremont Island, Great Salt Lake

In addition to encouraging a report on the progress of developing policy recommendations and other solutions as part of the 2019 *Concurrent Resolution to Address Declining Water Levels of the Great Salt Lake* (HCR-10), the Legislature passed (and the Governor signed) several additional key pieces of water legislation in 2020 that aim to increase flexibility and collaboration in managing the State's water resources. Many of the 2020 policy changes had their roots in the 2017 Recommended State Water Strategy. The water strategy recommendations are aimed at ensuring a "vibrant and sustainable water future" for the State, and to provide the basis for advancing policy, science, technology, education and innovation for water needs for "homes, businesses and farms while protecting our natural environment."

Policy updates in 2020 include:

- **S.B. 26 - *Water Banking Act*** authorizes a 10-year water banking pilot program that provides the opportunity for local right holders to create water banks for their local Region that will allow for the temporary and voluntary leasing of water rights. The objectives include promoting optimal use of the public's water, transparency, and access to markets. The Act's intent is to allow water rights to be leased to facilitate sustainable agricultural production, meet municipal demands, and help meet water quality standards and provide for a healthy and resilient natural environment.
- **H.B. 130 - Split-Season Uses and Applications to Change Water Use** authorizes short-term seasonal water uses for the benefit of agriculture, the environment, and other water uses. While split-season uses are subject to water availability and other conditions to avoid harm to users, it offers a means to share water for the benefit of many users, including the environment.
- **H.B. 166 - *Watershed Councils Act*** recognizes that *"collaborative solutions developed by diverse stakeholders have historically proven to be the most effective means to address Utah's water needs and to develop water policy."* The Act authorizes the creation of 12 local basin councils, including Great Salt Lake, as a forum for addressing watershed issues with local interests and expertise. The bill also establishes a Statewide "Utah Watersheds Council" to encourage and facilitate discussion and collaboration among stakeholders on various water-related matters.
- **H.B. 41 - State Water Policy** enumerates a range of water policies for Utah. Although the policy is too lengthy to describe in full, some of the points relevant to this report include promoting water conservation, efficiency and optimal use of water resources, including agricultural water to sustain food production, and understanding

the consequences of such actions. The Bill also encourages educating and engaging the public in individual actions to protect water quality and manage water use. Additionally recognized is the need for the "study and development of strategies and practices necessary to address declining water levels and protect the water quality and quantity of Great Salt Lake, Utah Lake and Bear Lake taking into consideration natural climate change, natural weather systems and patterns, and normal cyclic water level change over time, while balancing economic, social, and environmental needs."



Historical Water Level Fluctuations of South Arm, Great Salt Lake (1847 - 2019)

In 2020, crucial funding was approved by the Legislature for a Great Salt Lake Coordinator to serve as staff support for the GSLAC and as liaison between the GSLAC, State agencies and the many research and stakeholder groups for Great Salt Lake and its watershed. These important actions by the Legislature and Governor build upon work the GSLAC and others have been pursuing for many years.

The Steering Group wishes to acknowledge other, parallel efforts to address water supplies for Great Salt Lake, including the following:

- AECOM. 2019. Consequences of Drying Lake Systems Around the World. Prepared for the GSLAC. February 15.
- Bioeconomics, Inc. 2012. Economic Significance of the Great Salt Lake to the State of Utah. Prepared for the GSLAC. January.
- Bowen Collins & Associates. 2020. Conservation Impacts Study. Prepared for Weber Basin Water Conservancy District and the GSLAC.
- CH2M HILL. 2018. Great Salt Lake Integrated Model, v1.10: An Integrated Water Resource Management Tool for the Great Salt Lake Watershed. Draft report prepared for the State of Utah. January.
- Clyde Snow & Sessions and Jacobs Engineering Group Inc. 2020. Legal Analysis and Review of Select Water Strategies for Great Salt Lake. Prepared for the GSLAC.
- ECONorthwest. 2019. Economic Costs of a Declining Great Salt Lake. Prepared for the GSLAC. June.
- Jacobs Engineering Group Inc. 2019. Great Salt Lake Integrated Model (GSLIM); An Integrated Water Resource Management Tool for the Great Salt Lake Watershed, Phase II – GSLIM Evaluation. Prepared for the GSLAC. September 26.
- SWCA Environmental Consultants. 2017. "Water for Great Salt Lake." Prepared for the GSLAC. September.
- Utah Department of Natural Resources. 2013. Great Salt Lake Level Matrix in Final Great Salt Lake Comprehensive Management Plan and Record of Decision. Prepared by SWCA Environmental Consultants for Utah Division of Forestry, Fire, & State Lands. March 2013.

4. Developing and Refining Recommendations

Guiding Principles — The Steering Group began by familiarizing themselves with recent and ongoing studies and identified key principles to guide development of their recommendations.

Developing Ideas — Numerous informal working meetings were held to identify key challenges (Attachment B), and brainstorm potential needs and opportunities (Attachment C). No ideas were rejected; all ideas were noted and included in the discussions.

Refining Ideas — Steering Group members discussed ideas as a large group and from within smaller working groups focused upon legal matters, agriculture, municipal planning, and integrated planning. Ideas were further developed and refined into a list of the top sixteen strategic opportunities that could make a difference in ensuring adequate water flows to Great Salt Lake and its wetlands.

Recommendations — Steering Group members discussed, developed, and finalized specific and actionable recommendations for each of the 16 strategic opportunities.

5. Guiding Principles

The Steering Group identified seven principles that guided the development and refinement of its recommendations and could also serve to guide implementation:

Sailing on Great Salt Lake (*Photo Credit: Kurt Repanshek*)

1) Engage the public and decision-makers to better appreciate the value of Great Salt Lake, the steps that must be taken to preserve it, and what they can do to make a positive difference.
2) Promote flexibility and find new incentives to optimize water use and sustain healthy lake levels.
3) Better integrate sustainable water use into land use and economic development decisions.
4) Encourage ongoing research to ensure that we can answer critical questions such that the best available science drives management decisions moving forward.
5) Explore how existing laws and regulations can be used to protect water supplies for Great Salt Lake.
6) Find ways to adapt existing laws and regulations to better promote conservation and sustainable water management across the entire Great Salt Lake watershed.
7) Find thoughtful ways to sustain these efforts over time by ensuring adequate resources, including agency staffing and funding.

6. Strategic Opportunities and Final Recommendations

The Steering Group identified six focus areas consistent with the guiding principles that it believes will make a difference in ensuring adequate water flows to Great Salt Lake and its wetlands (Figure 1). These areas may not include every possible idea or solution to address the water needs of Great Salt Lake. However, together they provide a balanced approach for engaging the community, building upon existing laws and policy, and using science as a foundation for good decision-making.

Figure 1. Focus Areas Identified to Ensure Adequate Water Flows to Great Salt Lake and its Wetlands

The Steering Group discussed numerous needs and challenges and identified 16 strategic opportunities that fit within the focus areas (Table 1). Each strategic opportunity includes specific recommendations developed by the Steering Group. The recommendations vary in scope and complexity; however, they do not differ in their priority or importance. The Steering Group proposes that all of the recommendations are important, and they should all be carefully considered and acted upon accordingly.

The body of this report describes the issues addressed for each strategic opportunity, accompanied by specific recommendations.

Table 1. Strategic Opportunities to Ensure Adequate Water Flows to Great Salt Lake and its Wetlands

Educate and Engage	
1	**Find Ways to Help the Public and Decision-makers Connect with Great Salt Lake** *Sustained education and engagement of the public and decision-makers will help foster a spirit of cooperation and strengthen community support for the actions and funding needed to ensure protection of Great Salt Lake and its wetlands.*
2	**Create a Great Salt Lake Framework to Improve Coordination Among Governmental Entities and Other Stakeholders** *Coordinating decisions and actions across the watershed will minimize costs and maximize benefits to Great Salt Lake and its wetlands.*
Improve Information and Decision-Making	
3	**Better Measure Water Resources in Cost-effective Ways to Optimize Their Use** *Utah must continue to improve measurement and metrics to understand how best to manage its water resources and the trade-offs associated with shifts in water use over time.*
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5	**Develop an Integrated Strategy to Navigate Longstanding Legal and Policy Issues** *Preserving adequate flow for Great Salt Lake and its wetlands will require coordination and integration of water policy and strategies across water utilities and basins within the Great Salt Lake watershed.*

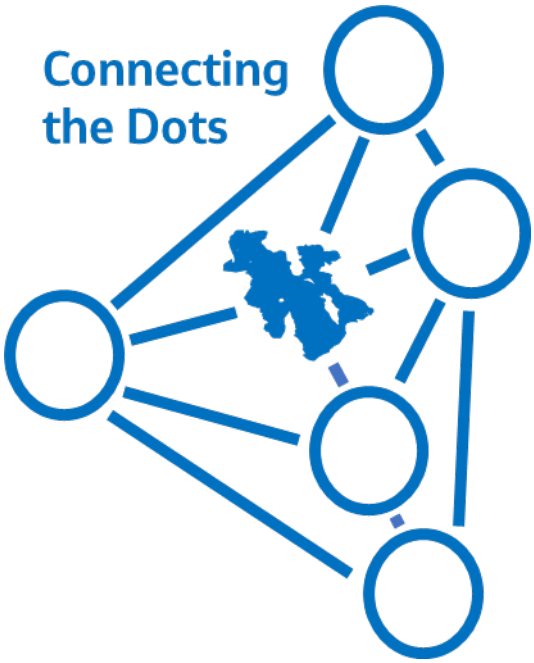
6	**Close Data Gaps in Baseline Condition of Water Flow to Great Salt Lake and its Wetlands** *A "first do no harm" approach should be implemented to leverage science to manage risk and make informed and forward-thinking decisions.*
Optimize Agricultural Water Use	
7	**Leverage Existing Programs that Optimize the Use of Water in Ways that Benefit Both Agriculture and Great Salt Lake** *Existing State and Federal program criteria could be better utilized and revised in ways that improve incentives for agricultural producers to optimize the use of their water. Connecting those programs to water supplies for Great Salt Lake could help expand the programs and make them more sustainable over time.*
8	**Where Possible, Maintain and Conserve Working Agricultural Lands Linked to the Great Salt Lake Ecosystem (to Preserve Return Flows)** *Protecting "at-risk" agricultural lands presents an opportunity to also protect Great Salt Lake and its wetlands.*
Optimize Municipal and Industrial Water Use and Land Use/Water Planning	
9	**Ensure that Water Planning Informs Land Use Decisions** *Because we cannot sustain growth in Utah without water, water planning must become an integral part of land use planning and economic development.*
10	**Find Ways to Use Less Water on Urban and Suburban Landscapes** *Metering secondary water, reducing the amount of turf, avoiding watering during the day, drip irrigation, and other strategies can reduce infrastructure costs, stretch water supplies, and help sustain Great Salt Lake and its wetlands over time.*
11	**Fully Understand How Land Use Changes Affect Water for Great Salt Lake and Better Manage Those Changes to Benefit the Lake** *Changes in land use affect the lake in different ways. To preserve the lake, we need to understand those effects and what they mean for the lake and its future.*
Refine Legal and Policy Options	
12	**Fully Explore How to Protect Water Supplies for Great Salt Lake Using Existing Legal Authorities** *Existing laws, authorities, directives, and policies may provide important, but under-utilized ways to benefit Great Salt Lake.*
13	**Fully Explore the Idea of Depletion-Based Models to Promote the Optimal Use of Water** *Utah should continue investigating depletion-based models that may provide water rights holders with meaningful incentives to reduce depletion and that take into account existing water rights.*
14	**Fully Explore how Principles of Prior Appropriation can Incentivize Efforts to Decrease Current Depletion Levels While Protecting Existing Rights** *Promote flexibility and find new incentives to optimize water use and sustain healthy lake levels while protecting existing water rights.*
15	**Explore New Statutory Authorities that Incentivize the Optimal Use of Water Resources and Allow Water Rights to be Used to Support Great Salt Lake** *We must identify new strategies and utilize existing authorities to augment water supplies to the lake and its wetlands while taking into account existing upstream water rights.*
Sustain Efforts Over Time	
16	**Identify Innovative and Sustainable Funding Sources to Ensure Adequate Water Supplies for Great Salt Lake** *New and sustainable methods should be sought to fund programs and other efforts to preserve Great Salt Lake and its wetlands.*

Educate and Engage

1 Find Ways to Help the Public and Decision-makers Connect with Great Salt Lake

***Key Takeaway**: Sustained education and engagement of the public and decision-makers will help foster a spirit of cooperation and strengthen community support for the actions and funding needed to ensure its protection.*

The Issue: Many in the public, as well as many State and Local decision-makers, may not currently have a good understanding of the importance of Great Salt Lake and its wetlands in fulfilling many public and Statewide values. They may not understand the potential costs if these resources decline and if they are lost. Public entities also may not appreciate the roles their organizations have in affecting the health of the lake and its wetlands.



Opportunity: Engaging the public, as well as State and Local decision-makers in understanding the economic, public health, and ecological importance of Great Salt Lake will create support for decisions needed to sustain the lake into the future. A meaningful and targeted engagement program could help our citizens see how their actions, including water use and supplies, connect to the health of Great Salt Lake and its wetlands, and vice versa.

Recommendations:

1-1 Develop and implement a comprehensive public engagement strategy that identifies the purpose of different types of engagement and the different audiences in order to improve conditions for and stewardship of Great Salt Lake.

1-2 Specifically, develop a Great Salt Lake education campaign that connects the public and decision-makers to their direct and indirect impacts to Great Salt Lake and its surrounding wetlands. This campaign should prioritize the State and Local decision-makers.

2 Create a Great Salt Lake Framework to Improve Coordination Among Governmental Entities and Other Stakeholders

***Key Takeaway:** Coordinating decisions and actions across the watershed will minimize costs and maximize benefits to Great Salt Lake and its wetlands.*

The Issue: While there are a number of groups and entities who are interested in preserving Great Salt Lake and who make recommendations to preserve lake levels and natural systems associated with the lake, there is no primary clearinghouse or manager dedicated to lake issues. This presents challenges in terms of overall coordination and integration.

Opportunity: Recent action to raise awareness of the needs of Great Salt Lake by the GSLAC and others, such as the creation of the office of a Great Salt Lake Coordinator in the DFFSL and the possible creation of a Great Salt Lake Watershed Council, is commendable. There is an opportunity to allow for a coordination framework that includes all of the Great Salt Lake interests while drawing from the technical recommendations from existing

advisory groups. The State should consider expanding the scope of the coordinator's role to advocate on behalf of the needs of the lake.

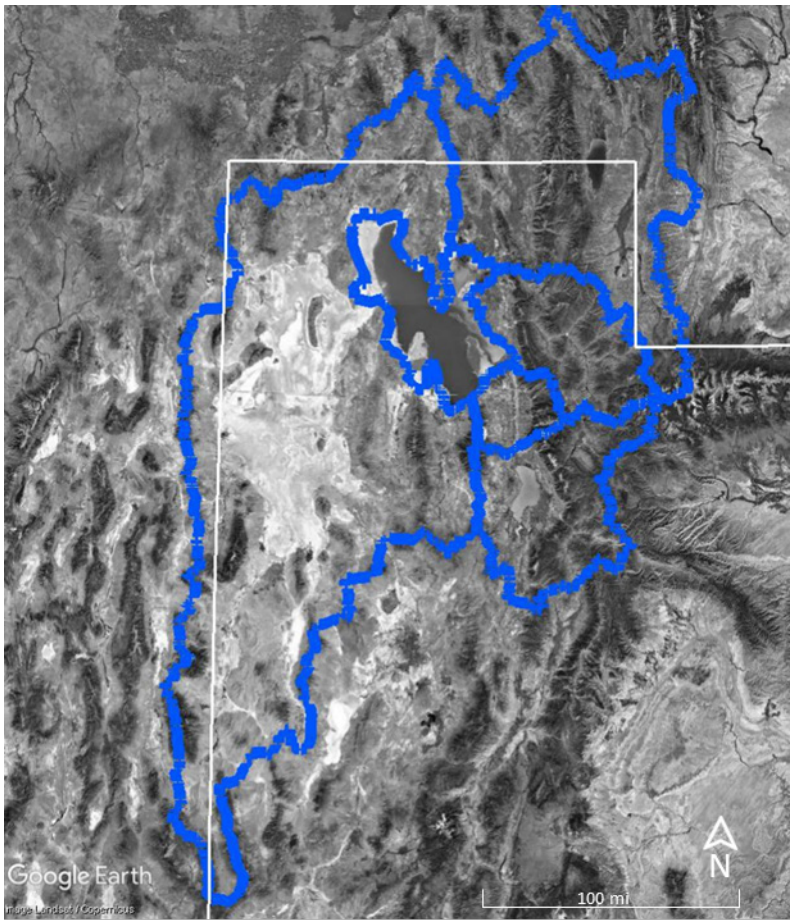
Recommendations:

2-1 Undertake a gap assessment and study to fully understand what aspects of coordination and integration for Great Salt Lake and across its watershed can be improved in order to inform the enhancement of the existing coordination framework.

2-2 Improve upon and modify the coordination framework for Great Salt Lake and its watershed to respect individual jurisdictions while providing an opportunity for integrated management. Evaluate an expansion of the Great Salt Lake Coordinator's responsibilities within the existing or a new integrated coordination framework.

2-3 Provide a steady source of funding for administrative support for an integrated coordination framework.

2-4 The Great Salt Lake Coordinator, or other designated person or entity, should seek to increase the effectiveness of protecting the lake by working with the jurisdictions of the lake and across its watershed to:



The Great Salt Lake Watershed is Composed of Numerous Jurisdictions
Aerial Image © 2020 Google. Annotation © 2020 Jacobs.

- Review ordinances and policies with Cities and Counties related to land use and water use.
- Develop and distribute tool kit/best practices and resources for water producers and end water users that would help reduce depletion in the Great Salt Lake watershed.
- Convey information concerning water flows to Great Salt Lake that are developed as a result of recommendations from this report or other relevant sources.
- Help provide educational material and opportunities to the public and for the use of political entities and other interested parties about ways to protect Great Salt Lake.
- Work with State and Local agencies to ensure that the needs of Great Salt Lake are considered when resource decisions are made. This recommendation does not apply to the adjudicative actions of State agencies, such as the State Engineer's office, who are required to act impartially and to avoid ex parte communications when making those types of decisions.

Improve Information and Decision-Making

3 Better Measure Water Resources in Cost-effective Ways to Optimize their Use

Key Takeaway: *Utah must continue to improve measurement and metrics to understand how best to manage its water resources and the tradeoffs associated with shifts in water use over time.*

The Issue: Previous studies have documented the benefits of accurately quantifying water supplies, diversions, and actual depletions. Improved data increases transparency and facilitates optimization of water use to improve crop production, reduce conflicts, and reduce fertilizer, herbicide, pesticide, and salt loading to water systems. Implementing new and improved water quantification systems; however, will require education, starting capital and ongoing technical support.

Opportunity: Quantification of water supplies, diversions, and actual depletions will increase transparency and accountability, inform better management and decisions, and stimulate innovation, and solutions. The Agricultural Water Optimization Task Force (Ag Task Force) has completed a case study of how Emery County implemented and benefited from improved quantification of water supplies and diversions and is beginning a pilot study to quantify actual depletions in the Beryl/Enterprise groundwater basin. There is an opportunity to leverage this work to maximize its benefits for the Great Salt Lake watershed.

Recommendations:

3-1 Provide funding to the DWRi, DWRe, and the Ag Task Force to evaluate existing practices and resources, develop alternatives, and make recommendations for quantifying water supplies, diversions, and actual depletion in the Great Salt Lake watershed. This should include an evaluation of potential considerations, benefits and consequences for water users, drainage basins and effects on Great Salt Lake and its wetlands and should include an opportunity for stakeholder involvement.

Quantification of canal flows, Orem, Utah

3-2 Pilot improved measurement, telemetry, and reporting for a basin in the Great Salt Lake watershed. Closely coordinate efforts with the recommended study of water depletions within the Great Salt Lake watershed under various current and future scenarios (see Opportunity No. 6, Close Data Gaps in Baseline Condition of Water Flow to Great Salt Lake and its Wetlands).

4 Agency and Other Decision-makers Should Account for Impacts to Great Salt Lake when Planning and Making Decisions that could Impact Great Salt Lake and its Wetlands

Key Takeaway: *Effort must be made to find ways to ensure that decision-makers understand how the decisions they make affect the lake in positive or negative ways and make sure that those effects inform their short and long-term planning and decision-making. To ensure the best use of limited resources, this will require agencies to work together to develop long-term and coordinated planning for actions that affect Great Salt Lake and its surrounding wetlands.*

The Issue: Over time (~150 years), water development, increasing water diversions, and land use changes have contributed to a long-term downward trend in water levels of Great Salt Lake. Changing climate conditions will add additional challenges for the lake's ecosystem. There are countless decisions made every day that influence downstream water bodies such as Great Salt Lake, but do not fully consider their benefits or impacts to these water bodies. Benefits and impacts from individual and collective actions and decisions need to be better understood to achieve informed decision-making and planning and thereby ensure adequate water flows to Great Salt Lake and its wetlands.

Opportunity: Many State and Local agencies have existing planning or decision-making authorities that can provide the basis for them to consider adverse effects and trade-offs concerning water flows or water levels for Great Salt Lake or its wetlands and the implications of them on ecosystems and surrounding communities. These existing authorities provide an opportunity to develop meaningful decision and planning support systems that increase the visibility and transparency of and responsibility for understanding these potential consequences. They also provide an opportunity to develop an enhanced understanding of trade-offs, as well as opportunities to avoid, minimize, mitigate or offset adverse effects.

Recommendations:

4-1 To reinforce the importance of meaningfully considering Great Salt Lake - the UDNR and UDEQ, and their Divisions, as well as other State agencies (such as, Department of Transportation) should adopt practices, processes, policies, or rules, where appropriate, to inform planning or decision-making to meaningfully consider whether a decision, combination of decisions, planning effort(s) or other actions will adversely affect water flows or water levels for Great Salt Lake or its wetlands. Where appropriate, ways in which impacts can be avoided, minimized, or mitigated should be considered and incorporated into decisions, planning or action(s).

4-2 As part of a broader integration and coordination effort among agencies and stakeholders, develop needed tools, models and frameworks to facilitate meaningful consideration of effects of decisions or planning – including:

- Develop an overall water budget and depletion analysis for the Great Salt Lake watershed to facilitate meaningful consideration of effects of decisions, planning or actions.
- Continue efforts to advance the functionality of the GSLIM as one of the support tools.

4-3 Local communities surrounding Great Salt Lake (Cities and Counties, planning agencies, publicly owned wastewater and stormwater management entities) should also incorporate meaningful consideration of Great Salt Lake and its wetlands in decision-making or planning. A plan should be developed and implemented to encourage and facilitate such efforts with local communities and agencies, as part of the broader educational and outreach efforts described in Opportunity No. 1 (Find Ways to Help the Public and Decision-makers Connect with Great Salt Lake).

4-4 Before State incentives are provided to economic development projects, evaluate the amount of water consumption associated with a proposed project to ensure that water is being efficiently used or whether it is appropriate to provide incentives.

Wilson's Phalaropes, Antelope Island, Great Salt Lake
(Photo Credit: Camilla Cerea/Audubon)

4-5 DWQ could implement a practice or policy to prioritize water quality implementation measures that do not deplete water in the Great Salt Lake basin and where possible provide additional flow to Great Salt Lake tributaries. This includes consideration of such implementation approaches as water banking, water quality trading, nonpoint source implementation, and incentives to promote infiltrative rather than evaporative approaches to stormwater management.

4-6 Develop an incentive or certification system to recognize and award good stewardship efforts that benefit Great Salt Lake.

4-7 Provide adequate resources and funding to State agencies to support recommendations to meaningfully consider Great Salt Lake in decision-making and planning.

5 Develop an Integrated Strategy to Navigate Longstanding Legal and Policy Issues

Key Takeaway: *Preserving adequate flow for Great Salt Lake and its wetlands will require coordination and integration of water policy and strategies across water utilities and basins within the Great Salt Lake watershed.*

The Issue: Longstanding legal and policy issues surrounding Great Salt Lake are complex and require adaptive and strategic planning. Current planning efforts are specific to individual agency mandates and/or do not include broader watershed management plans.

Opportunity: Current planning efforts could be broadened and conducted more frequently to integrate all Local and State agency mandates and planning efforts. The most obvious planning effort to consider expanding would be the Great Salt Lake Comprehensive Management Plan led by the DFFSL, water quality strategies implemented by the Utah DWQ, and the river basin plans developed by Utah DWRe.

Recommendations:

5-1 Create a recurrent (3-year) strategic planning process to ensure Local- and State agency-specific resource plans are frequently incorporated into longer term and broader planning for Great Salt Lake and its surrounding wetlands.

6 Close Data Gaps in Baseline Condition of Water Flow to Great Salt Lake and Its Wetlands

Key Takeaway: *A "first do no harm" approach should be implemented to leverage science to manage risk and make informed and forward-thinking decisions.*

The Issue: Certain studies are needed to better inform integrated planning especially with respect to water and land management decisions in the Great Salt Lake watershed.

Opportunity: Understanding the potential implications of decisions such as water re-use, impervious cover, infiltration of storm water, and evaporative loss in tributary watersheds could help identify new strategies for delivering more water to Great Salt Lake and would inform the State's strategies for managing some of these issues.

Recommendations:

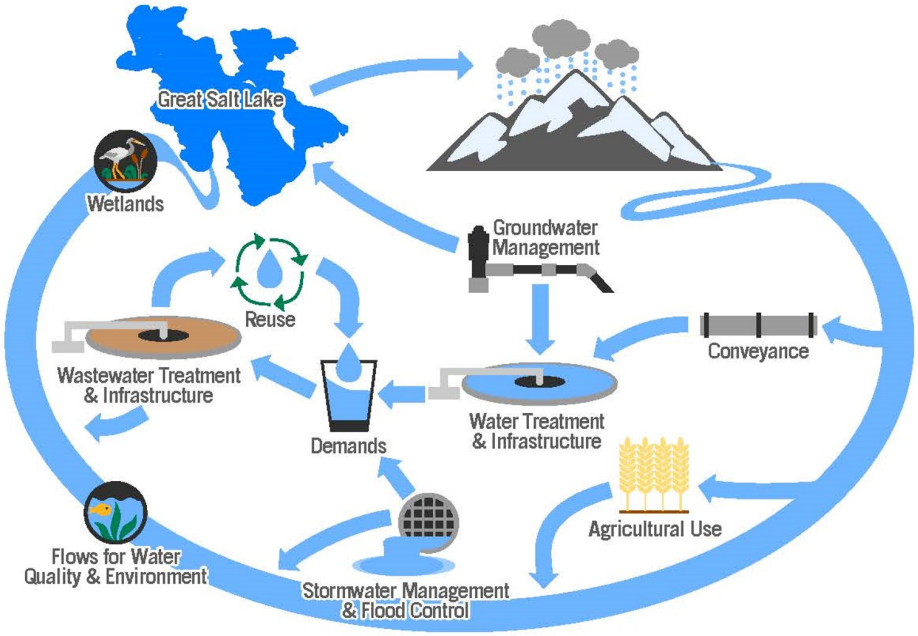
6-1 Building on existing research and modeling, fund a comprehensive study of water depletions, including Municipal and Industrial (M&I), agriculture, and other depletions, within the Great Salt Lake watershed under various current and future scenarios. This study would provide a baseline against which the impact of future activities can be measured and the potential for reducing depletion in the future. This information could be used to evaluate population growth, a changing climate, water re-use, groundwater and surface water management, stormwater management strategies, water conservation strategies, and land development trends.

6-2 Fund a study to evaluate the impacts of wastewater flows to Great Salt Lake including the potential for wastewater re-use. The study should assess the associated water rights, economics, water quality elements and the implications for water levels and ecology of the lake and its wetlands.

6-3 Fund a study to better understand the connection between groundwater, including the shallow aquifers, and Great Salt Lake including potential effects of changes in infiltration and runoff along the benches and in the valley.

6-4 Evaluate how water quality trading could be used as an avenue for increasing streamflows in receiving waters.

6-5 Ensure studies take into consideration individual bays and basins of Great Salt Lake. Individual bays and basins are not interchangeable, and each bay is both uniquely important and part of the whole system.



We are all part of "One Water"

Optimize Agricultural Water Use

7 Leverage Existing Programs that Optimize the Use of Water in Ways that Benefit Both Agriculture and Great Salt Lake

Key Takeaway: *Existing State and Federal program criteria could be better utilized and revised in ways that improve incentives for agricultural producers to optimize the use of their water. Connecting those programs to water supplies for Great Salt Lake could help expand the programs and make them more sustainable over time.*

The Issue: The State of Utah, the U.S. Department of Agriculture Natural Resources Conservation Service, and others make funding available to producers with the objective of optimizing irrigation practices. Optimization of water use is defined and implemented differently depending upon the program. There is a need for consistent objectives and selection criteria that can help guide funding toward infrastructure and practices that benefit water management (such as, reduce water consumption) and deliver water to downstream uses such as Great Salt Lake.

Drip Irrigated Onions

Flood Irrigated Onions

Opportunity: There is significant interest on the part of agricultural producers and water users to optimize their water management (that is, reduce consumption/depletion), particularly if there are financial incentives that help reduce the cost of implementing these practices. State and Federal agencies and others are investing monies to incentivize these practices. There is an opportunity to coordinate the efforts of the various programs to better clarify objectives and prioritize practices to include maximizing benefits to downstream water uses such as Great Salt Lake. The Ag Task Force is considering development of similar criteria and guidance for funding agricultural water optimization projects in the future.

Recommendations:

7-1 Request that the Utah Department of Agriculture and Food and Ag Task Force develop criteria to be used in guiding investments in agricultural water optimization programs to improve water management (such as, reduce water consumption), while ensuring flows to Great Salt Lake are not diminished by implementing the criteria or to increase opportunities to deliver water to downstream uses such as Great Salt Lake. Provide the opportunity for stakeholder involvement in the effort.

8 Where Possible, Maintain and Conserve Working Agricultural Lands Linked to the Great Salt Lake Ecosystem (to Preserve Return Flows)

Key Takeaway: *Protecting "at risk" agricultural lands presents an opportunity to also protect Great Salt Lake and its wetlands.*

The Issue: Valuable producing agricultural lands and their associated water supplies are rapidly being converted into other uses within the Great Salt Lake watershed. Many of these "at-risk" lands are located near or adjacent to natural streams, rivers, lakes and wetlands, including the Great Salt Lake ecosystem. Some of these agricultural lands are located at the bottom of drainage basins and have senior water rights. Conversion of land and water use from Agricultural to M&I uses may or may not change system depletions, but they do impact communities, surface water bodies, groundwater recharge, and habitat for birds and other wildlife.

Opportunity:
Maintaining or conserving production on agricultural lands is a means of preserving local agricultural production, open space, and rural communities and sound water management policy. Conserving these lands could maintain return flows or instream flow by maintaining water deliveries through a basin to downstream agricultural lands. Further, conserving these lands could facilitate delivery of conserved water and return flows to Great Salt Lake without the potential for added diversions or consumption.

Recommendations:

8-1 Further develop programs, funding sources, and explore options for maintaining agricultural lands; particularly where they benefit Great Salt Lake from return flows, surrogate habitat (migratory birds such as white-faced ibis feed in fields near Great Salt Lake), and so forth.

8-2 Invest State and Federal funds to purchase conservation easements or compensate producers for development rights restrictions. The proposed Land Water Conservation Fund program may present a unique and near-term opportunity to utilize Federal funds to accomplish this.

Urban Development is Converting Historically Agricultural Lands

8-3 Undertake a study of agricultural lands in the vicinity of Great Salt Lake (such as, in the Malad and Lower Bear River Region) to assess their importance to return flows benefiting Great Salt Lake and its wetlands, exploring how conversion of agricultural to urban land uses may impact those return flows and options for preserving agricultural operations and related return flows, including: land use planning and farmland preservation programs. This can be linked with Opportunity No. 7 (Leverage Existing Programs that Optimize the Use of Water in Ways that Benefit both Agriculture and Great Salt Lake).

Optimize Municipal and Industrial Water Use and Land Use/Water Planning

9 Ensure that Water Planning Informs Land Use Decisions

Key Takeaway: *Because we cannot sustain growth in Utah without water, water planning must become an integral part of land use planning and economic development.*

The Issue: Not all Cities and Counties operate drinking water systems. However, they all exercise control over land use decisions. Currently, Cities and Counties are not required to think about how their land use regulations influence water use. As a result, they may miss opportunities to reduce water use as land is developed or re-developed.

Opportunity: In order to be approved, the large majority of land uses in the State of Utah are required to complete some type of approval process at the city or county level. If that review included a component that considered how water can be efficiently utilized and conserved, the amount of water required for development could be reduced, more growth could be accommodated without increasing pressure for additional source development, and less water could be diverted from the entire Great Salt Lake watershed or other natural systems.

Recommendations:

New Development above Jordanelle Reservoir, Wasatch County, Utah

Cities and Counties can:

9-1 Include an element in their general plan addressing how to integrate land use decisions and water use. The general plan is the base document on which other ordinances are established and is used to guide future development decisions.

9-2 Examine subdivision lot standards and how those standards affect water use. This may include limiting the amount of irrigated areas on a lot, considering smaller lots for single family homes and encouraging development that is water efficient.

9-3 Adopt ordinances addressing water efficiency for new development and re-development of existing lots.

9-4 Address water efficiency for existing development by looking for opportunities or incentives to modify landscaping, replace fixtures or modify operations.

9-5 Consider linking economic development activities or other development incentives with improved and reduced water usage.

9-6 Adopt water concurrency requirements for new development with those requirements linked to the reasonable water need of the development, including recognizing development that is water efficient.

9-7 Work together to create and distribute best management practices for government, commercial/industrial operations and institutional facilities to conserve water.

10 Find Ways to Use Less Water on Urban and Suburban Landscapes

Key Takeaway: *Metering secondary water, reducing the amount of turf, avoiding watering during the day, drip irrigation and other strategies can reduce infrastructure costs, stretch water supplies, and help sustain Great Salt Lake and its wetlands over time.*

The Issue: The State of Utah has made progress on optimizing water use on urban landscapes by requiring the installation of meters on new connections to secondary water systems. The full benefit of metering cannot be fully realized unless efforts are also made to address existing connections to secondary water systems.

Opportunity: Over time, additional measures can be taken to further optimize the outdoor use of water in non-agricultural settings. By optimizing Utahns' water use, it may be possible to delay or forestall major public water development projects in the Bear River and elsewhere, which would benefit lake levels and save taxpayer money.

Recommendations:

10-1 In some cases, a secondary water system may be fully built out without any way of using water that may be conserved through more efficient operations. These systems could benefit from a process that would allow them to expand their service area, to reduce their contracts with the supplying entity, or to find a way to account for the saved water and allow that water to be used elsewhere, such as through a water bank or be delivered to Great Salt Lake.

Urban outdoor water use remains a significant demand in our water systems

10-2 Technologies other than metering should be studied to determine if water use by existing customers can be determined (such as, through aerial imagery) which could then lead to more customer information and accountability.

10-3 Secondary water systems should consider financial penalties for those customers who use excessive amounts of water for their needs.

10-4 Grants with local match or low interest loans should be examined as a method to encourage retrofitting existing connections with meters.

11 Fully Understand How Land Use Changes Affect Water for Great Salt Lake and Better Manage Those Changes to Benefit the Lake

Key Takeaway: *Changes in land use affect the lake in different ways. To preserve the lake, we need to understand those effects and what they mean for the lake and its future.*

The Issue: As noted in Opportunity No.8 (Where Possible, Maintain and Conserve Working Agricultural Lands Linked to the Great Salt Lake Ecosystem [to Preserve Return Flows]), preserving agricultural lands is essential to ensuring the sustainability of Great Salt Lake. Nevertheless, continued M&I development will be inevitable. When agricultural land is developed for M&I use, the water associated with that land is not always included in the land planning and development review process or is considered for

subsequent uses. In other instances, a large commercial or industrial water user might be interested in becoming more water efficient but lacks sufficient incentives to undertake such a project.

Historical Agricultural Water Converted for Use in Suburban Outdoor Landscapes

Opportunity: Although many cities require development to bring wet water as a condition of annexation or development, there is no uniform method for analyzing the amount of water that was being depleted on the land prior to development and ensuring that the full amount of depletion is addressed. In cases where historic depletion is greater than the depletion required for the new growth (excess depletion) there is an opportunity to use that excess depletion for other anticipated growth (thereby avoiding the need for major new water development) or in other ways that could benefit Great Salt Lake.

Recommendations:

11-1 There is a need to study and better understand how depletions from irrigation translate into other uses such as M&I use. This data could help inform integrated water and land use planning processes. If there is water available in excess of prior depletion when agricultural land is converted to other uses, a Local or Regional water market might allow for remaining water to be used as part of a Local or Regional market for development or use in Great Salt Lake. However, both the long- and short-term implications must be understood.

11-2 Likewise, there is a need to study and better understand depletion rates of M&I uses, particularly associated with landscaping.

11-3 The State could also encourage delivery of water available in excess of prior depletion, or from investments that reduce the water demand of an industrial or commercial operation, to Great Salt Lake through mechanisms such as tax credits, some type of conservation easement, or other means.

11-4 Public water suppliers could recognize water efficient development by reducing water exactions if decreases in minimum water system sizing requirements are allowed by the Division of Drinking Water under Utah Administrative Code Rule 309-510-4(1) and 309-510-6.

11-5 The State could develop a standard for certification of water efficient development which could then be used by a developer or others in advertising or promotional materials.

Example of Suburban Development in Herriman, Utah, 2010-2017

Aerial Image © 2020 Google. Annotation © 2020 Jacobs.

Refine Legal and Policy Options

12 Fully Explore How to Protect Water Supplies for Great Salt Lake Using Existing Legal Authorities

Key Takeaway: *Existing laws, authorities, directives, and policies may provide important, but under-utilized ways to benefit Great Salt Lake.*

The Issue: Water in Great Salt Lake and its surrounding wetlands comes largely from four watersheds (Bear, Weber, Jordan, and West Desert) as well as precipitation. Some of the water flowing to Great Salt Lake and its wetlands are associated with existing water rights held by State wildlife management areas, federal wildlife refuge, or privately managed wetlands. Utah law provides that "[b]eneficial use shall be the basis, the measure and the limit of all rights to the use of water in this state." Utah courts have further clarified that the concept of beneficial use depends upon the circumstances of the specific use, meaning that beneficial is not a static concept and may be modified over time in response to changes in science and values associated with water use.[1] In other words, beneficial use is often a flexible doctrine in Utah that depends upon the specific circumstances of a given appropriation.[2] Given this framework, it is therefore important to note that the potential beneficial uses and users of water for Great Salt Lake have not been thoroughly tested, analyzed, or clarified under existing legal and policy frameworks.

Opportunity: A guiding principle of the Steering Group is to utilize existing legal and policy frameworks where possible. Members of the Steering Group believe there are current opportunities to utilize existing law, authorities, directives and policies to support the beneficial use of water in Great Salt Lake and allocate water rights to the lake. Efforts are underway by the Steering Group to evaluate and discuss these opportunities to determine their applicability and whether further clarifications or amendments or new policies needed.

Recommendations:

12-1 Conduct a comprehensive review of existing water law, authorities, directives, and policies to determine how the current legal structure could support the beneficial use of fresh water flowing into Great Salt Lake and its wetlands. Key questions to be addressed include:

- What existing statutory mandates and laws currently exist regarding the use of water to support lake levels in Great Salt Lake?

Emerging Microbialite Reef, Near the South Shore of Great Salt Lake

[1] *In the General Determination of the Waters of Utah Lake and Jordan River Butler, Crockett & Walsh Develop. Corp. v. Pinecrest Pipeline Operating Co.*, 2004 UT 67, ¶ 46, 98 P.3d 1 [hereinafter *Pinecrest*]. *See also Delta Canal Co.*, 2013 UT at ¶ 22 (stating, "[o]ver time, the types of use considered to be beneficial have expanded to encompass not only economically beneficial uses, but also uses that promote conservation, recreation, and other values deemed to be socially desirable.").

[2] *Pinecrest*, 2004 UT at ¶ 46.

- What direction has the Legislature given State agencies or municipalities through resolutions, directives, and any other actions that provide guidance regarding the extent to which water could be used to support lake levels in Great Salt Lake is a beneficial use of water?
- Are there existing authorities that are not being utilized or that require further clarification from the Legislature?

12-2 Depending upon the results of this review, specific recommendations could then be developed on ways the Legislature could clarify the extent of water to benefit Great Salt Lake as a beneficial use of water.

13 Fully Explore the Idea of Depletion-Based Models to Promote the Optimal Use of Water

Key Takeaway: *Utah should continue investigating depletion-based models that may provide water rights holders with meaningful incentives to reduce depletion and take into account existing water rights.*

The Issue: Agricultural water rights are currently administered by limiting diversions to a prescribed duty and acreage defined by the beneficial use of a water right. The legal "measure" of the water right is the water physically depleted (that is, consumptive use) from the water system when using the water. Administering water rights by duty and acreage does not provide agricultural water users with significant flexibility or incentive to optimize, including reducing, water use.

Opportunity: Administering water rights using depletion in addition to duty and acreage could provide water users with additional flexibility and incentive to optimize water use but doing so could also result in unintended consequences. The Ag Task Force is beginning a pilot study of depletion accounting methods in the Beryl/Enterprise groundwater basin. There is an opportunity to leverage this work and explore depletion-based models that maximize benefits for the Great Salt Lake watershed while protecting existing water rights.

Recommendations:

13-1 Provide funding to the DWRi, DWRe, and the Ag Task Force to undertake a coordinated and transparent evaluation of legal, technical and administrative requirements to administer water rights by depletion versus by irrigation diversion duty and number of acres irrigated. This should include an evaluation of potential considerations, benefits and consequences for water users, drainage basins, overall depletions, and effects on Great Salt Lake and its wetlands and should include an opportunity for stakeholder involvement.

13-2 Pilot depletion accounting in the Great Salt Lake watershed to validate methods in northern Utah.

14 Fully Explore how Principles of Prior Appropriation can Incentivize Efforts to Decrease Current Depletion Levels While Protecting Existing Rights

Key Takeaway:
Promote flexibility and find new incentives to optimize water use and sustain healthy lake levels while protecting existing water rights.

The Issue: The 2019 HCR 10 states "the lake is currently on a sustained, downward trend having lost significant volume and substantial river inflow over the past 150 years, leaving large areas of exposed lakebed…". Maintaining or decreasing current levels of depletion (consumption) from M&I, Institutional, and Agricultural water use is a potential strategy to minimizing the risk of further declines in lake water levels.

Opportunity: The Steering Group believes it will likely be more effective to remove barriers that constrain or disincentivize reductions in water depletions (that is, lowering consumptive water use) and to identify and create incentives to maintain or decrease current depletion levels. Many of the Steering Group's recommendations work

toward this end. Further, the GSLAC Water Strategies Report includes a legal analysis and review of select strategies that provide some related approaches.

How can we best incentivize water use that preserves flow for downstream uses?

Recommendations:

14-1 Pursuant to the recommendations from Opportunity No. 2 (Create a Great Salt Lake Framework to Improve Coordination Among Governmental Entities and Other Stakeholders) and the GSLAC's recent legal analysis (Clyde Snow & Jacobs 2020), study existing legal authority to identify barriers and incentives to water use optimization efforts that could benefit downstream uses such as Great Salt Lake.

14-2 Create a water use optimization program similar to what other states have done in which water right holders receive compensation or are otherwise incentivized to optimize their water use, provided that any such program would not increase depletions.

15 Explore New Statutory Authorities that Incentivize the Optimal Use of Water Resources and Allow Water Rights to be Used to Support Great Salt Lake

Key Takeaway: *We must identify new strategies and utilize existing authorities to augment water supplies to the lake and its wetlands while taking into account existing upstream water rights.*

The Issue: The Utah State Engineer regulates the distribution of water and assists water users in physically allocating water according to water rights as defined by the Prior Appropriation Doctrine. Water rights are based upon beneficial use. For water intended for Great Salt Lake to reach the lake (that is, for water rights to be allocated to Great Salt Lake), there must be a beneficial use for the water in Great Salt Lake. The State Engineer has approved some rights for various uses in Great Salt Lake. Additionally, the new water banking program would allow for banked water to be used within the lake. The full extent to which water rights can be beneficially used in the lake, however, has not been thoroughly tested to its potential limits.

Opportunity: If the analysis described in Opportunity No. 12 (Fully Explore How to Protect Water Supplies for Great Salt Lake Using Existing Legal Authorities) determines that further statutory authority is needed, additional authority could be modeled upon the instream flow statute (Utah Code Ann. §73-3-30).

Recommendation:

Possible elements of such statutory authority could include:

15-1 Allowing for greater authority to utilize conservation pools and lake levels in Great Salt Lake.

15-2 Provide for shepherding of water to the Great Salt Lake ecosystem.

15-3 Creating express statutory authority to support lake levels in Great Salt Lake similar to the instream flow statute, Utah Code Ann. § 73-3-30(11). Such authority would not, however, include the limitation in Utah Code Ann. § 73-3-30(11) that administers instream flow change applications "according to the

Island Road Canal, Audubon Gillmor Sanctuary, Great Salt Lake

change application's priority date relative to other water rights located within the stream section specified in the change application for instream flow." Instead, it would specify that the priority for water rights used for Great Salt Lake would be administered like other change applications.

15-4 Give more authority and/or funding to the DWiR, Division of Parks and Recreation, and DFFSL to acquire or lease water rights to be used to benefit Great Salt Lake.

Sustain Efforts Over Time

16 Identify Innovative and Sustainable Funding Sources to Ensure Adequate Water Supplies for Great Salt Lake

Key takeaway: *New and sustainable methods should be sought to fund programs and other efforts to preserve Great Salt Lake and its wetlands.*

The Issue: Flexible, temporary, or other market options, including water banking, may be available to provide water for Great Salt Lake to meet its critical needs. Funding will be required to incentivize water optimization or acquire water for Great Salt Lake when it is permitted. Public funding is currently limited and private sources are unlikely to be adequate in times of serious shortage. Innovative strategies for funding these acquisitions will need to be developed. Incentivizing private or third-party donations is one potential means of building partnerships to increase inflows to Great Salt Lake.

Opportunity: Identify opportunities and creative ways for sustained sources of funding for incentives and water acquisitions to ensure adequate water flows for Greater Salt Lake and its wetlands, including:

Recommendations:

16-1 Study creative financing mechanisms and other ways to leverage private and public funding.

16-2 Increase direct appropriations to those State agencies with responsibilities that relate to Great Salt Lake to ensure such agencies have sufficient resources to enact any changes the group may recommend

16-3 Establish partnerships to lease and acquire water for Great Salt Lake.

16-4 Create tax incentives for water rights that are donated to benefit Great Salt Lake.

7. Next Steps

The Steering Group envisions a concerted effort to **engage the community**; the combined efforts of decision-makers and the public are the solution. Utah has proven what it can accomplish if Utahns engage and collectively work to overcome a challenge.

Utah's investments in water law, policy and infrastructure have enabled incredible growth. The Steering Group envisions **building upon existing laws and policy** to strengthen the framework Utahns have already been given; to enable Utah to again rise above and overcome the challenges that come with that growth.

The Steering Group envisions harnessing the ingenuity and determination that has enabled Utahns to prosper. **Science, technology, innovative strategies, and market incentives** are elements that Utah has proven it can carry out very well.

Lastly, the Steering Group envisions a Great Salt Lake that remains a cornerstone of Utah's community, culture, economy, and environment – preserving this part of our Utah water legacy for future generations.

The Steering Group urges discussion that leads to action. The recommendations are not prioritized nor are intended to include all or exclude any ideas or define the perfect formula for success. Instead, these recommendations represent common ground. They are a firm foundation upon which Utahns – citizens, industry and government alike - can develop and determine a course of action with a common purpose; to preserve Great Salt Lake as a centerpiece of Utah's water legacy. Collaboration is the solution.

8. Conclusion

Great Salt Lake is a centerpiece of our Utah water legacy. Its waters are the confluence of the intricate network of tributaries that connect our communities. Its waters return to and sustain these communities through its contribution to winter snows. Preserving it will be a challenge. However, as shown in similar lake systems around the world, losing this linkage could prove to be even more challenging and costly to our communities. Preserving Great Salt Lake is a challenge we can and must overcome. We must start now.

Sunrise over Great Salt Lake

9. References

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Attachment A
Concurrent Resolution to Address Declining Water Levels of the Great Salt Lake
House Concurrent Resolution 10, 2019 General Session, State of Utah

Enrolled Copy **H.C.R. 10**

CONCURRENT RESOLUTION TO ADDRESS DECLINING WATER LEVELS OF THE GREAT SALT LAKE

2019 GENERAL SESSION

STATE OF UTAH

Chief Sponsor: Timothy D. Hawkes

Senate Sponsor: Scott D. Sandall

LONG TITLE

General Description:

This concurrent resolution recognizes the critical importance of continued water flows to Great Salt Lake and its wetlands and the need for solutions to address declining water levels, while appropriately balancing economic, social, and environmental needs.

Highlighted Provisions:

This resolution:

▶ urges expeditious and collaborative development of recommendations for policy and actionable solutions to avert economic, social, and environmental harm due to declining water levels at Great Salt Lake and its wetlands; and

▶ encourages reports to the Legislature and Governor.

Special Clauses:

None

Be it resolved by the Legislature of the state of Utah, the Governor concurring therein:

WHEREAS, in 2014 the Utah Legislature recognized the "economic, recreational, and natural significance of the Great Salt Lake" pursuant to enrolled H.J.R. 20, Joint Resolution Recognizing the Significance of the Great Salt Lake (General Session 2014);

WHEREAS, Great Salt Lake, the largest saline lake in the Western Hemisphere, is a symbol of our state, an economic driver, and a unique and complex ecosystem of regional, international, and hemispherical importance;

WHEREAS, Great Salt Lake and its wetlands support a range of economic activities,

H.C.R. 10 **Enrolled Copy**

accounting for a total regional economic output of more than $1.3 billion annually from mineral extraction, brine shrimp harvesting, recreation, including hunting, birding, and boating, and other uses;

WHEREAS, Great Salt Lake and its wetlands are recognized as hemispherically and globally important habitat for millions of waterbirds, waterfowl, and shorebirds;

WHEREAS, Great Salt Lake is home to three state parks, five state waterfowl management areas, a national bird refuge, and private preserves and duck clubs;

WHEREAS, the "lake effect" from Great Salt Lake provides an important contribution to snowpack in the Wasatch Range, which is crucially important to Utah's water cycle and its tourism, agricultural, and other industries;

WHEREAS, many state, local, and federal entities have responsibilities relating to the management and preservation of Great Salt Lake, its wetlands, wildlife, or communities that rely on the lake's many resources;

WHEREAS, the Great Salt Lake Advisory Council was established in 2010 to advise Utah administrative and legislative bodies on the sustainable use, protection, and development of Great Salt Lake;

WHEREAS, water levels at Great Salt Lake and its wetlands can fluctuate naturally, however, the lake is currently on a sustained, downward trend having lost significant volume and substantial river inflow over the past 150 years, leaving large areas of exposed lakebed;

WHEREAS, the current trajectory suggests there is a real and near-term risk of significant and irreversible impacts to the health of Great Salt Lake and its wetlands, which also poses a threat to Utah's economy, public health and welfare, air quality, environmental resources, and the ability to provide water to meet Utah's growing economy;

WHEREAS, other states or communities with closed basin lakes that have experienced excessive drying, have witnessed dire outcomes and have incurred enormous costs and public health, environmental and other economic effects;

WHEREAS, Great Salt Lake and its ecosystem could face a similar fate due to historic water management practices, diversions, drought and variable climatic conditions; and

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WHEREAS, by taking steps now, Utah will be best-positioned to avoid the kind of degradation and economic harm experienced by other states or communities:

NOW, THEREFORE, BE IT RESOLVED that the Legislature of the state of Utah, the Governor concurring therein, recognize the critical importance of ensuring adequate water flows to Great Salt Lake and its wetlands, to maintain a healthy and sustainable lake system.

BE IT FURTHER RESOLVED that the Legislature and the Governor recognize there is a need for an overall policy that supports effective administration of water flow to Great Salt Lake to maintain or increase lake levels, while appropriately balancing economic, social, and environmental needs, including the need to sustain working agricultural land.

BE IT FURTHER RESOLVED that the Legislature and the Governor encourage the Departments of Natural Resources and Environmental Quality through their relevant divisions to expeditiously, jointly, and collaboratively engage with a wide-range of stakeholders to develop recommendations for policy and other solutions to ensure adequate water flows to Great Salt Lake and its wetlands.

BE IT FURTHER RESOLVED that the Legislature and the Governor encourage the presentation of findings, conclusions, and recommendations to the Legislature and Governor, including encouraging a report of progress in achieving the objectives of this resolution to the Natural Resources, Agriculture, and Environment Interim Committee by no later than November 30, 2020.

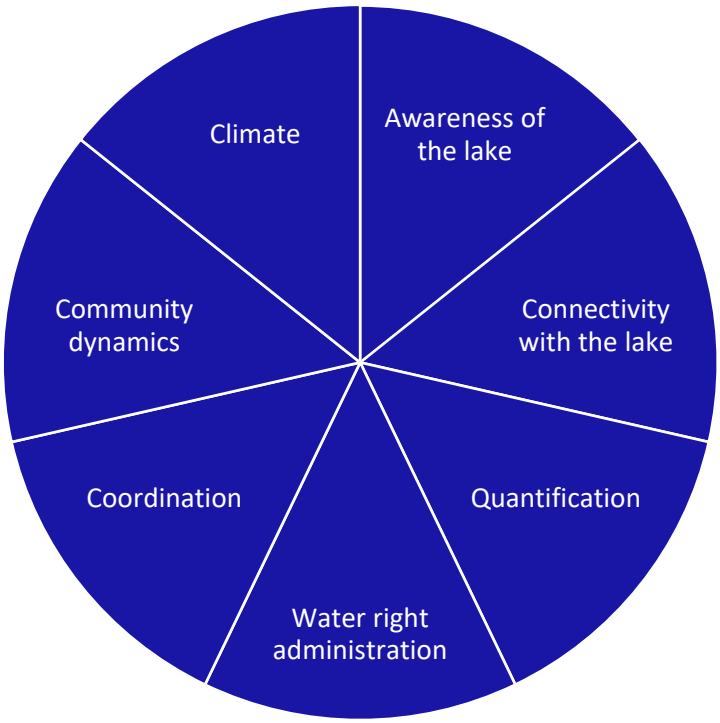
BE IT FURTHER RESOLVED that a copy of this resolution be sent to the Utah Department of Natural Resources, the Utah Department of Environmental Quality, the Great Salt Lake Advisory Council, and all municipalities and counties bordering Great Salt Lake or within the Great Salt Lake watershed.

Attachment B
Key Challenges in Ensuring Adequate Water for Great Salt Lake and Its Wetlands

The following is a summary list of key challenges identified during conversations with Steering Group members. The list is not intended to identify all possible challenges; it simply served as a starting point for the Steering Group's discussion of potential recommendations.

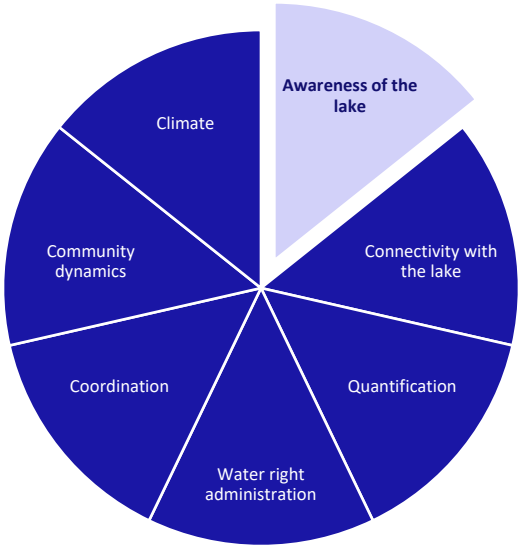
What are the biggest challenges in ensuring adequate water for Great Salt Lake and its wetlands?

1. Awareness of the lake
2. Connectivity with the lake
3. Quantification of conditions, impacts, and needs
4. Water right administration
5. Coordination
6. Community dynamics
7. Climate



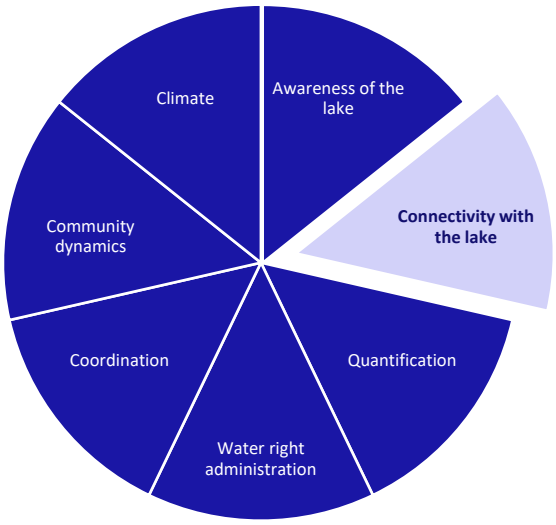
1. Awareness of the lake

- a. Is there a problem now? Or in the future?
- b. Value of the lake
  - *i. Economic benefits*
  - *ii. Quality of life*
  - *iii. Out of sight, out of mind*
  - *iv. No interaction with the lake*
- c. Impacts to the lake
  - *i. Individual Contribution*
  - *ii. Collective Contribution*
- d. Political will
  - *i. Can it even be fixed?*
  - *ii. Understanding/education*
  - *iii. What options do we have?*
- e. Value of water
  - *i. To the individual*
  - *ii. For other water users*
  - *iii. For the environment*
  - *iv. Why should we conserve?*



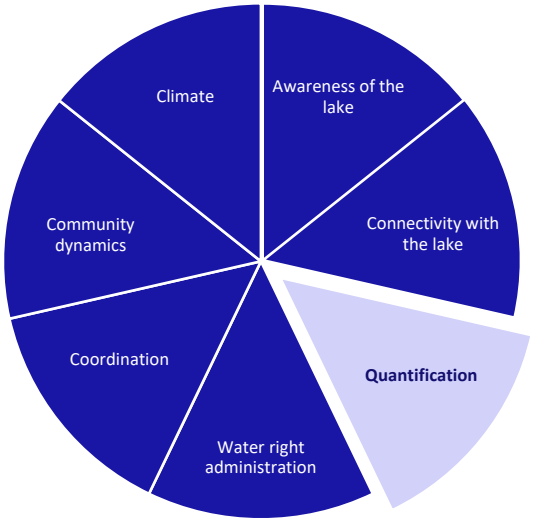
2. Connectivity with the lake

- a. Water supply planning
- b. Legal boundaries
  - *i. Partnerships*
- c. Policy
- d. What area is included in a plan?
- e. How does the watershed affect the lake?
- f. How does the lake affect the watershed?
- g. Economics



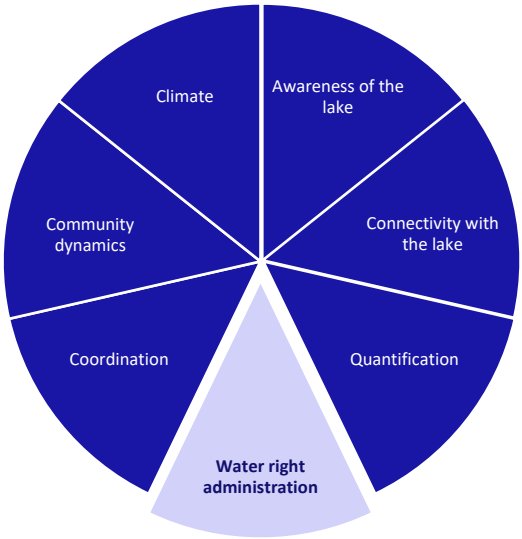
3. Quantification

- a. Water supply
  - *i. Existing*
  - *ii. Future*
  - *iii. Groundwater*
- b. Depletions
- c. Lake levels
  - *i. How much water is needed?*
  - *ii. What is minimum lake level?*
- d. Dust source
  - *i. Dust on snow*
  - *ii. Air quality*
- e. Climate change
  - *i. How?*
- f. Lake effect snow



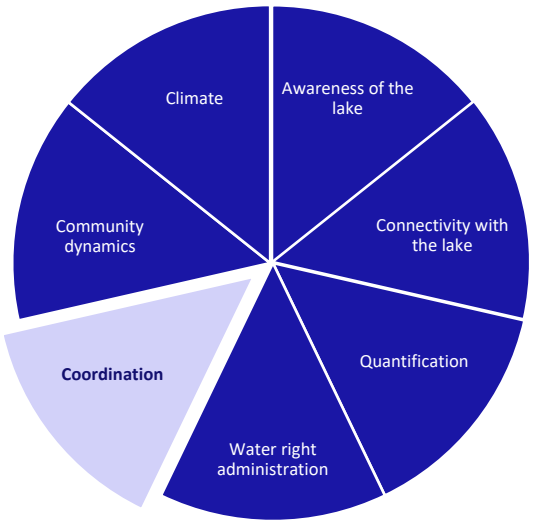
4. Water Rights Administration

- a. Incentive to conserve?
  Use it or lose it.
- b. Conserved water only goes to the next user
- c. Process can be challenging
- d. Risks in leasing water
- e. Flexible?
- f. Multiple goals and benefits?
- g. Lake has no water right?
- h. Public welfare



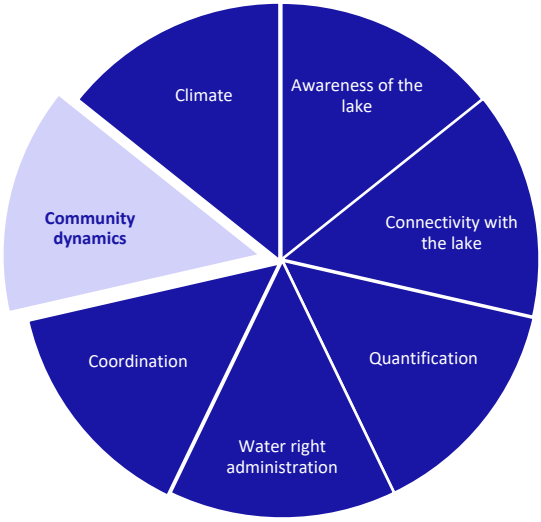
5. Coordination

- a. UDNR division mandates
- b. Who is in authority?
- c. Funding
- d. Potential federal action
- e. Understanding diverse views
- f. Perceived conflicting objectives
- g. Partnerships



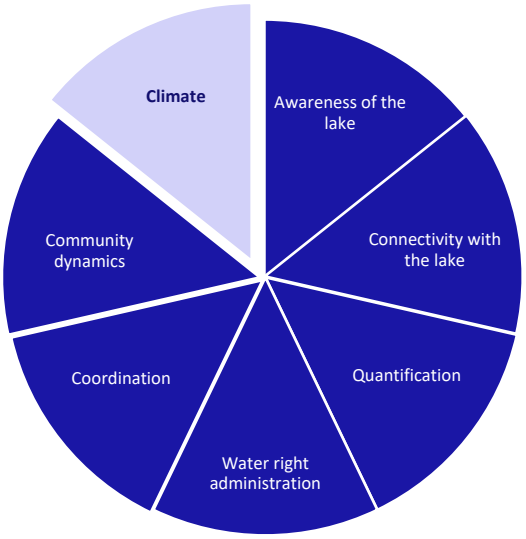
6. Community Dynamics

- a. Population Growth
- b. Economic Growth
- c. Land use – how is water included?
- d. Water use patterns – incentives?
- e. Water planning in response to growth
- f. Diversions
  - *i. Streams*
  - *ii. From Great Salt Lake*
- g. Re-use
- h. Risks
  - *i. Fear of change*
  - *ii. Potential to lose water right*
- i. Problem is too big
- j. Property rights
- k. Generational equity



7. Climate

- a. Future changes
- b. Drought



Attachment C
Initial Ideas for Ensuring Adequate Water For Great Salt Lake and Its Wetlands

The following is a summary of ideas identified during brainstorming sessions with Steering Group members. The list is not intended to identify all ideas; it simply served as a starting point for the Steering Group's discussion of potential recommendations.

What Are the Best Opportunities to Ensure Adequate Water for Great Salt Lake and Its Wetlands?

1. Define the problem
2. Improve awareness/connectivity
3. Develop legal strategies
4. Integrate planning activities
5. Develop innovative solutions

1. Define the problem

- a. Define the current problem; in 2050 or 2060
  - *i. What should the lake look like?*
  - *ii. Do we have a problem now?*
  - *iii. What are the potential impacts from a declining lake?*
- b. Define the benefit of Great Salt Lake
  - *i. What is the value of the lake to Utah? To the world?*
  - *ii. Economic benefits*
- c. Define how our hydrology is changing now and may in the future
  - *i. Quantify water supplies*
  - *ii. Quantify water demands*
  - *iii. Better define lake hydrology*
  - *iv. What portion of the water balance can we control?*
- d. Develop a comprehensive plan to protect Great Salt Lake

2. Improving awareness & connectivity

- a. Improve coordination of lake & watershed
  - *i. Improve agency coordination*
  - *ii. Develop linkages to watershed organizations*
  - *iii. Complete stakeholder assessment*
- b. Improve awareness of and connection to the lake
  - *i. Education of policy makers*
  - *ii. Education of the public*
  - *iii. Communication plan*
  - *iv. One community*

3. Develop legal strategies

a. Consider means to protect flow to Great Salt Lake
   - *i. Shepherding*
   - *ii. Beneficial use for instream flow or Great Salt Lake*
   - *iii. Consider depletion accounting*
   - *iv. Manage water for multiple goals?*
   - *v. Streamline water rights administration*
   - *vi. Avoid public trust lawsuit*

b. Consider regulatory implications
   - *i. Consider air quality impacts*
   - *ii. Consider water quality impacts*
   - *iii. Consider public welfare*

4. Integrate planning activities

a. Link land use and economic development planning to water planning

b. Integrated water resource management & planning
   - *i. Understand the consequences of choices*
   - *ii. Integrate planning across basins*
   - *iii. Incorporate water quality into planning*
   - *iv. Innovate by considering multiple uses*

c. Develop a means to track the true value and cost of water

5. Develop innovative solutions

- a. Implement water conservation
  - *i. Identify water volume required*
  - *ii. Determine alternatives*
  - *iii. Coordinate efforts across basins*
  - *iv. Maximize return on investment*
  - *v. Develop incentives*
  - *vi. Quantify conserved water*
- b. Identify new sources of water to import to the basin
- c. Protect ag lands adjacent to the lake
- d. Develop incentives and funding sources
  - *i. Incentives for water conservation*
  - *ii. Monetize water to the lake to encourage investment*
  - *iii. Grants and loans for implementation*
  - *iv. Invest in research*