

Testimony of Marcelle Shoop
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Subcommittee on Water, Oceans, and Wildlife,
U.S. House Natural Resources Committee

Hearing on Bills:

*H.Res. 320 (Rep. Joe Neguse, D-CO), H.R. 4832 (Rep. Susie Lee, D-NV),
H.R. 5001 (Rep. Joe Neguse, D-CO), H.R. 5345 (Rep. Blake Moore, R-UT)*

November 4, 2021

“Saline Lake Ecosystems in the Great Basin States Program Act of 2021”

Chairman Huffman, Ranking Member Bentz and members of the subcommittee, thank you for holding this timely hearing on several important bills to address water and wildlife in the West. It is an honor to provide testimony on the Saline Lake Ecosystems in the Great Basin States Program Act of 2021. Thank you to the bill sponsors led by Representative Moore with co-sponsors Chairman Huffman, Representative Lee, Representative Thompson, Representative Obernolte, and Representative Costa. As you are well aware, we have had another year of historic drought across the West, which is already harming communities, birds, fish, and other natural resources. Great Salt Lake is at alarmingly low water levels this year—dropping by nearly a foot below its previous historic low.

My name is Marcelle Shoop and I serve as the Saline Lakes Program Director for the National Audubon Society (Audubon). I am a long-time Utah resident with a background in environmental and natural resources law, policy development, western water, and stakeholder relations. Prior to my role at Audubon, I had a career with Rio Tinto, a global minerals and metals producer, where I held various legal and managerial roles focused on sustainability and socially responsible business practices.

Audubon is a leading national nonprofit organization representing more than 1.8 million members. Since 1905, we have been dedicated to the conservation of birds and the places they need, today and tomorrow, throughout the Americas using science, advocacy, education, and on-the-ground conservation. Audubon advocates for balanced solutions to water use in the West to ensure birds, ecosystems, people, and economies thrive.

Saline Lakes Are at Risk, Particularly with Drought and Climate Change

In the arid West, saline lakes and their wetlands form an irreplaceable network of habitats that support millions of migrating shorebirds, waterfowl and other waterbirds throughout their

annual travels. These lakes and their wetlands – from emergent marshes to playas and mudflats – are part of the habitat mosaic essential to many bird species.

Saline lakes are sometimes referred to as terminal lakes because they are situated at the bottom of a watershed basin. Freshwater inputs can be seasonal, but there are no water outlets. Consequently, water is lost only through evaporation and diversions, resulting in a concentration of salts and other dissolved minerals significantly higher than most lakes (at least 3 grams of salt per liter).

These lakes also provide important economic, recreational, public health, and other community benefits.ⁱ Saline lakes, such as Great Salt Lake in Utah, Mono Lake in California or Lake Abert in Oregon, and others throughout the Great Basin, as well as their water sources, benefit millions of people, businesses, livelihoods, and contribute to quality of life. For example, Great Salt Lake has economic and social importance associated with mineral production, brine shrimp harvesting, recreation, and other uses.

Unfortunately, saline lakes have declined dramatically in the last hundred years and continue to be at risk because of declines in water flows due to increasing water demand, diversions, drought, and climatic stresses. The drying of these lakes will increase salinity, adversely affecting habitat and food availability for migratory birds and other wildlife. Moreover, the exposed lake bed can increase wind borne dust, jeopardizing public health and causing negative impacts on local businesses, snowpack, and water security.

Great Salt Lake—Our Country’s Largest Saline Lake—Is at Risk

Great Salt Lake is not only a vital resource for Utahns, it also is a centerpiece in that network of saline lakes. With more than 7 million birds using Great Salt Lake annually, degradation of habitat and lack of water would be devastating for birds and the saline lakes network as whole.

Businesses such as the mineral and brine shrimp industries and recreational activities—including hunting, boating, and bird-watching—rely on the lake and represent nearly \$1.32 billion annually in economic activity.ⁱⁱ In addition to the economic, ecological, and cultural importance of a healthy lake, adequate water levels also protect public health from lakebed dust exposure, avoid detrimental harm to agriculture production from dust, avoid increasing dust on snow that results in early melt and loss of storage, and contribute to Utah’s lake effect snow.

Utah’s well-being and its water future hinge on the long-term health of Great Salt Lake. That reality is made even more clear in a report commissioned by the Great Salt Lake Advisory Council that outlines the potential economic costs that could ensue if the lake’s ecosystem collapsed. With Great Salt Lake’s water levels on a sustained downward trend, “further declines, particularly those over a long period, could result in losses totaling \$1.69 billion to \$2.17 billion per year,” according to the *Assessment of Potential Costs of Declining Water Levels in Great Salt Lake*.ⁱⁱⁱ

Other consequences of a drying Great Salt Lake include: the potential for reductions in property values, costs and impacts to water management systems dependent on Wasatch snowpack,

possible impacts to agriculture, or disruption to international airport operations due to dust. There are also costs associated with impacts on bird populations that rely on the internationally and hemispherically important bird habitat provided by the lake and its wetlands.

Although water levels at Great Salt Lake and its wetlands vary seasonally, and naturally over time, if levels drop too far and for too long the lake's ecosystem cannot continue to fully benefit the surrounding communities, the businesses, or the birds that rely on it. Great Salt Lake's future is more uncertain now than ever given Utah's anticipated population growth (nearly doubling by 2065), climatic stress, proposals for large upstream diversions and pressures to divert and reuse wastewater flows that currently supply the lake.

Leaders in my home state of Utah have begun taking steps to ensure water flows to Great Salt Lake and its wetlands over the long term and have identified this as the single most important strategy to prevent further drying of the lake. The state's 2019 Concurrent Resolution to Address Declining Water Levels of the Great Salt Lake (HCR010) and follow up reports clearly recognize "the critical importance of ensuring adequate water flows to Great Salt Lake and its wetlands, to maintain a healthy and sustainable lake system."^{iv} Keeping water flowing to Great Salt Lake's wetlands and open water habitats is vital to maintaining important natural areas of international and hemispheric importance for birds, while also benefiting people. Furthermore, it is much more costly to fix a dry lake than it is to protect an existing one.

Audubon Supports the Saline Lake Ecosystems in the Great Basin States Program Act of 2021

The Saline Lake Ecosystems in the Great Basin States Program Act (the Act) authorizes the United States Geological Survey (USGS) to establish a regional program to assess, monitor and benefit the hydrology of saline lakes in the Great Basin and the migratory birds and other wildlife dependent on those habitats. This legislation builds on scientific findings showing that saline lakes across the Great Basin provide interconnected bird habitats, and therefore need to be assessed and managed in a way that maintains that connectivity. The Act will complement state efforts and, when funded, will provide USGS with the resources it needs to bring technical and scientific information to entities with management responsibilities and can build on existing efforts around water and wildlife management at the state level, particularly in Utah, Nevada, Oregon, and California.

Providing water, habitat, and food at the right times and places for migratory birds across the network of saline lakes in the West requires a regional approach, starting with integrated hydrologic and ecological monitoring and assessments to provide the technical basis for effective and coordinated management and conservation actions. The overarching goal of this legislation is to establish a multi-year program that builds the scientific foundation needed to inform coordinated management and conservation actions for threatened Great Basin saline lake ecosystems and the birds that rely on them.

USGS is uniquely positioned to lead the effort to increase scientific understanding of these irreplaceable saline lake habitats, through a multi-year monitoring and assessment program. The saline lake ecosystems program requires an integrated and regional approach founded in science

to successfully deliver the data, tools and analyses, as well as needed coordination across a wide geography and among many stakeholders, including federal, state, tribal and local water and resource managers. The importance of connecting ecological, birds and human aspects with water quality and quantity assessments cannot be understated and USGS Mission Area frameworks are already ideally suited for this.

USGS has well-established programs and activity streams to undertake the scientific work and manage stakeholder relations required by the Act, through the leadership of its Integrated Water Availability Assessments framework^v, part of its Water Availability and Use Science Program.^{vi} Through this program, USGS concentrates on determining availability of water for human and ecological uses, including water quantity and quality, assessing long-term trends in water availability and efforts to improve forecasting water availability for economic, energy and environmental uses. USGS describes Integrated Water Availability Assessments (IWAAs) as “multi-extent, stakeholder driven, near real-time census and prediction of water availability for both human and ecological uses at regional and national extents.”

The IWAAs program, working closely in coordination with the USGS Ecosystems Mission Area, U.S. Fish and Wildlife Service, state wildlife agencies, Tribes, academic institutions, and other stakeholders, such as local agricultural producers and communities, can define the work and implementation plan in a way that connects the wildlife and human needs with water availability.^{vii} The Saline Lakes Ecosystem legislation builds on scientific findings showing that saline lakes across the Great Basin provide interconnected bird habitats, and therefore need to be managed in a way that maintains that connectivity.

USGS is not a decision-maker about how saline lake ecosystems will be managed going forward, but the agency is best suited to provide the natural science and technical information that resource managers need to make informed decisions about how to work across a large geographic region, with a wide-range of stakeholders and resource managers in ways that can lead to coordinated approach across the Great Basin states that can benefit birds and humans.

Authorized Funding and Stakeholders - The legislation authorizes \$5 million per year for five years and calls for USGS to develop a work and implementation plan within one year, in coordination with the Fish and Wildlife Service and other federal, state, tribal, local, higher education institutions, non-profits and other stakeholders.

Work and Implementation Plan - The work and implementation plan would include:

- A synthesis of existing literature and data; and assessment of scientific and data needs for hydrology, bird movements, environmental changes and other stressors, including climate stressors;
- A description of how the plan should be implemented, including proposed monitoring, data infrastructure and tools; and
- Recommendations for a multi-year program along with a cost estimate for implementing the multi-year plan.

In addition to a regional scale assessment, there is the need for long-term selective monitoring at targeted lake systems. Different saline lakes need customized approaches. Some may need additional equipment to collect water data; some, like Great Salt Lake, may need additional studies and efforts to coordinate and integrate a range of water and wildlife monitoring and assessments.

Cooperative Funding and Grants - Importantly, the legislation authorizes USGS to use funds appropriated for the purposes of the Act, to enter into cooperative funding agreements or provide grants to other federal, state, tribal, and local entities as well as academic institutions, non-profits or other stakeholders. These funds could be used for participation and providing information for the development of the implementation plan, as well as carrying out assessments and monitoring of hydrology, birds, biology and ecologic resources.

Many of the states that are home to these saline lakes also are focusing their own resources and programs that can also be leveraged with the USGS program. For example, the State of Utah appropriated \$750,000 in 2021 for the USGS and UGS to undertake an effort to downscale and update groundwater models to improve the understanding of groundwater interactions with the lake and wetlands and provide decision-support tools.

Given that the legislation will set up a new program with limited funding, it is likely that water quantity or quality studies at less-understood saline lakes in Oregon, Nevada, and Utah may be prioritized in the assessment. However, monitoring bird movements through the region will highlight the importance of Salton Sea and other saline lakes across the West.

Saline Lakes Function as an Interconnected Ecosystem and Are Essential for Migratory Birds

The network of saline lakes provide essential stopover sites for large concentrations of migrating shorebirds, including Marbled Godwits, Western Sandpipers, and Red-necked and Wilson's Phalaropes. They are also important breeding sites for American Avocets, Black-necked Stilts, Long-billed Curlews, Wilson's Phalaropes, Cinnamon Teal, Gadwall and many other shorebird, waterfowl and other waterbird species. Species such as Ruddy Duck, Northern Pintail, Common Goldeneye, Eared Grebe, White-faced Ibis also are dependent on these saline lake ecosystems.

No other ecosystems in the arid West can meet these species' unique requirements. Since shorebirds and waterbirds congregate in large numbers at these sites, they are particularly vulnerable to habitat loss.

Collectively, saline lakes in the West support global populations of birds, including over 99 percent of the North American population of Eared Grebes, up to 90 percent of Wilson's Phalaropes, and over 50 percent of American Avocets. Saline lakes are critically important to migratory shorebird species, whose populations have declined nearly 70 percent since 1973.

The U.S. Fish and Wildlife Service *Intermountain West Joint Venture (IWJV) 2013 Shorebird Implementation Plan* identifies saline lakes and adjacent sites as the most important shorebird sites in the Intermountain West.^{viii} These lakes, "identified as key sites for conservation action within this plan," include: "Lake Abert and Summer Lake, Oregon; Mono Lake, California

(International significance), Honey and Alkali Lakes, California; and Goose Lake, California / Oregon (Regional significance).”^{ix} These sites are identified as key sites for conservation action within the IWJV plan. Notable use by migrant shorebirds include approximately 1.4 million shorebirds annually at Great Salt Lake^x and 50,000 to 125,000 shorebirds at Lahontan Valley.^{xi}

As documented in Audubon’s *Water and Birds in the Arid West: Habitats in Decline* report, some of these important habitats have decreased in size by 50-95% over past 150 years.^{xii} For example, it is estimated that at Utah’s Great Salt Lake, consumptive water uses have reduced river inflows by 39%, decreasing the lake volume by nearly half. In Nevada, it estimated that 84% of Lahontan Wetlands have been lost over the last 150 years. At Lake Abert in Oregon, reduced inflows substantially affect water levels, increasing salinity concentrations, beyond tolerated levels, which limits production of food sources relied on by migratory birds. In 2014, the extent of Lake Abert declined to just 5% of its maximum size lake levels to an area of about 3,000 acres, and in 2021 this lake is again experiencing low water levels.

Federal Investment and Coordination Needed for Saline Lakes and to Manage Drought Impacts

Amid a changing climate, we can avoid losing key habitats, and promote a stronger, more resilient network of saline lakes for the future, if we create coordinated efforts and smart investments. Improved understanding of the trends in water supply and water quality, habitat availability, and impacts on vulnerable migratory bird species is essential to support coordinated management of this irreplaceable network of saline lake habitats. This will be the first time the federal government aims to study and monitor these lakes in a coordinated regional manner.

Federal public lands constitute nearly 73 percent of the watersheds that feed western saline lake systems. These federal lands include the Bureau of Land Management, Fish and Wildlife Service, Bureau of Reclamation, Forest Service and even Department of Defense including strategic military operations areas, and air force bases, such as Hill Air Force Base in Utah. Even within a ten kilometer range of saline lakes, 69.5 percent of lands are federally managed. This includes key national wildlife refuges integrally linked with the fate of the saline lakes and wetlands systems including places such as Bear River Migratory Refuge at Great Salt Lake in Utah and Stillwater National Wildlife Refuge in Nevada that provide migratory bird habitat for a range of species and public waterfowl hunting access.

Across the Great Basin, numerous agencies and organizations help to manage the water and wildlife aspects around saline lakes. These include multiple jurisdictions across this large geography—from the local to state to regional to federal levels. Resources are limited and thus addressing the scientific and data needs for wildlife habitat, hydrology, environmental changes and other stressors across this large region have made it challenging to coordinate. Local action is needed at many saline lakes, but assessing the situation and implementing a monitoring program across a number of states and jurisdictions will take coordination and additional science resources, which an agency like USGS can undertake collaboratively with partners.

As we know from the highly-studied Colorado River basin, climate change is already impacting western water supplies. The Colorado River has lost 20% of its historic flows in the past 20 years.

Fifteen years ago, water managers pointed to drought, which has recurred periodically over the past century. Today it is clear—and Colorado River water managers understand—that the shrinking water supply is largely due to climate change, with increased temperatures accounting for 33% of the 21st century decline.^{xiii}

A recent analysis by the IWJV, “Climate and human water use diminish wetland networks supporting continental waterbird migration,”^{xiv} found significant downward declines in surface water extent comparing the two periods of 1984-1999 and 2000-2018 (sans 2012) in 18 snowmelt watersheds that feed endorheic or terminal lake and wetland systems in the Great Basin. This represented a 27% decline in lake extent and a 47% decline in wetland extent.

Federal leadership is needed to provide the resources necessary to address this challenge. Congress should use all available options to invest in immediate and long-term solutions to mitigate current disasters and enhance the climate resilience of states affected by historic drought conditions.

Conclusion

Given the threat of drought, climate change, and water availability, solutions to the issues faced by Great Salt Lake and other Great Basin saline lakes and their wetlands will require sound science and collaborative approaches that provide the foundation for improved coordination and management actions to conserve this network of lakes for the wildlife and people dependent on them. This legislation is widely supported by federal and state agency partners in the region and a wide-range of stakeholder interests, as exemplified by the organizations in Utah supporting this Act which include The Nature Conservancy of Utah, Utah Waterfowl Association, Trout Unlimited, Great Salt Lake Brine Shrimp Cooperative, Rio Tinto Kennecott, Compass Minerals, Weber Basin Water Conservancy District, Friends of Great Salt Lake, the Utah Audubon Council and local Audubon chapters, Utah Airboat Association, and Utah Wetlands Foundation.

Audubon’s hope and interest is in highlighting the need for coordinated conservation action for birds and people in these unique ecosystems. An improved understanding of the trends in water supply and water quality, habitat availability, and impacts on vulnerable migratory bird species is essential to support coordinated management of this irreplaceable network of saline lake habitats. This legislation will provide supporting data to address the plight of saline lakes across the region and help stakeholders create longer-term solutions.

Maintaining healthy bird populations depends on proactively managing these habitats amid water demands across the region. Solving these water challenges will require collaboration, innovation, and flexibility in how we use, share, and manage water so that people, birds, and wildlife can thrive together.

As Congress considers priorities and funding opportunities, Audubon supports increasing federal investments and leadership for saline lakes and natural resources across the West. After this year’s historic drought and catastrophic wildfires, we urge Congress to ensure that federal agencies receive critically needed resources to prepare now for the effects of climate change by

promoting nature-based solutions for restoring watersheds and ecosystems. In addition, Congress has several pending bills with bipartisan support that respond to the many needs of tribal communities and western states' water supply needs that we are supporting, including the other bills in today's hearing: H. Res. 320 sponsored by Rep. Joe Neguse to provide access to clean water for Native Americans and Alaska Natives, H.R. 5001 also sponsored by Rep. Joe Neguse to continue to implement endangered fish recovery programs for the Upper Colorado and San Juan River Basins, and H.R. 4832 sponsored by Rep. Susie Lee to establish the Open Access Evapotranspiration (OpenET) Data Program. It is imperative that our communities have the resources they need to prepare for and respond to the climate and drought crisis.

Thank you very much for the opportunity to provide this testimony. We look to your leadership and appreciate working with you to advance this crucial legislation and related appropriations.

ⁱ Wilsey, Chad B., Lotem Taylor, Nicole Michel, and Karyn Stockdale. *Water and Birds in the Arid West: Habitats in Decline*. National Audubon Society. 2017. New York, New York, USA. See:

https://www.audubon.org/sites/default/files/wbaw_report_5july17_updated.pdf

ⁱⁱ Great Salt Lake Advisory Council. *Economic Significance of the Great Salt Lake to the State of Utah*, Executive Summary of January 2012 Report prepared by Bioeconomics, Inc. for Great Salt Lake Advisory Council. 2012.

<https://documents.deq.utah.gov/water-quality/standards-technical-services/great-salt-lake-advisory-council/Activities/DWQ-2012-006863.pdf>

ⁱⁱⁱ Great Salt Lake Advisory Council. *Assessment of Potential Costs of Declining Water Levels in Great Salt Lake*, November 2019 Report and Executive Summary prepared by ECONorthwest and Martin & Nicholson for Great Salt Lake Advisory Council. 2019. Full document: <https://documents.deq.utah.gov/water-quality/standards-technical-services/great-salt-lake-advisory-council/activities/DWQ-2019-012913.pdf>. See: <https://deq.utah.gov/great-salt-lake-advisory-council/activities-great-salt-lake-advisory-council>.

^{iv} State of Utah Legislature. *H.C.R. 10 Concurrent Resolution to Address Declining Water Levels of the Great Salt Lake*. 2019. See: <https://le.utah.gov/~2019/bills/static/HCR010.html>.

^v United States Geological Survey. *Integrated Water Availability Assessments*. See: https://www.usgs.gov/mission-areas/water-resources/science/integrated-water-availability-assessments-iwaas?qt-science_center_objects=0#qt-science_center_objects.

^{vi} United States Geological Survey. *Water Availability and Use Science Program*. See: <https://www.usgs.gov/water-resources/water-availability-and-use-science-program>.

^{vii} United States Geological Survey. *Mission Areas*. See: <https://www.usgs.gov/mission-areas/ecosystems>.

^{viii} Oring, Lewis, Larry Neel, and Kay E. Oring. *Intermountain West Regional Shorebird Plan Version 1.0*. 2013. U.S. Shorebird Conservation Plan. See: <https://www.shorebirdplan.org/wp-content/uploads/2013/01/IMWEST4.pdf>.

^{ix} Intermountain West Joint Venture. *Shorebird Implementation Plan, Ch. 5*. 2013.

<https://www.shorebirdplan.org/wp-content/uploads/2013/01/IMWEST4.pdf>

^x Max Malmquist (Audubon) email correspondence with John Neil (Avian Biologist, Utah Division of Wildlife Resources)

^{xi} See: https://whsrn.org/whsrn_sites/lahontan-valley-wetlands/

^{xii} Wilsey et al. 2017. *Water and Birds in the Arid West: Habitats in Decline*.

^{xiii} Udall, B. and J. Overpeck. *The twenty-first century Colorado River hot drought and implications for the future*, 2017. *Water Resources Res.*, 53.

^{xiv} Donnelly, J. Patrick, Jonnie N. Moore, et al. *Climate and human water use diminish wetland networks supporting continental waterbird migration*. 2020. *Global Change Biology*.

<https://onlinelibrary.wiley.com/doi/10.1111/gcb.15010>