November 6, 2023

Great Salt Lake Wetlands

Harms from Utah Inland Port Development

A report from: Stop the Polluting Port, Great Salt Lake Audubon, Utah Physicians for a Healthy Environment, Great Basin Water Network, Center for Biological Diversity

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Introduction

The Big Picture: The Utah Inland Port Authority has become the single greatest threat to the wetlands of the Great Salt Lake

We wrote this report because not only does Great Salt Lake face ecological collapse, but so too do the wetlands that surround the lake. We cannot save the lake if we sacrifice its wetlands. Unfortunately the current greatest driver of harm to Great Salt Lake wetlands is coming from an agency the state created: the Utah Inland Port Authority.

By definition, wetland areas are either permanently or seasonally saturated by surface or groundwater. As developable land becomes more scarce and more expensive in the Great Salt Lake Basin, developers are looking at wetlands as new locations to develop industrial projects. But developing land and constructing buildings in and adjacent to wetlands is expensive because of extra structural requirements necessary to achieve soil stabilization. To offset extra costs, developers are looking for public subsidies and other taxpayer funded help from the Utah Inland Port Authority (UIPA). These undeveloped wetland areas usually do not have the necessary infrastructure in place such as paved roads, sewer lines, electricity, stormwater drainage, etc., which would further increase their costs. But using public money, UIPA intends to come to the aid of these corporate developers.

There are many reasons to be concerned about using public money to create public harm by destroying wetlands with industrial development. We explore those issues in this report.

Wetlands provide irreplaceable services for the environment (scientists refer to

these as “ecosystem services”) including filtering and helping to manage water, as well as providing critical wildlife habitat.

The scientists tell us that the Great Salt Lake is in crisis and that substantive steps have to be taken immediately if there is hope for the lake to survive. The effects of the demise of the GSL are beyond calculation.

The only comparison that we have is Owens Lake in California that was approximately 1/19th the size of GSL with a small fraction of the surrounding population compared to the Wasatch Front. Owens Lake dried up in 1926. Los Angeles county and the state of California have spent over 2.5 billion dollars to mitigate the effects of the blowing dust with ongoing annual costs in the millions of dollars.

There are many keys to saving the GSL. It begins with saving the wetlands surrounding the lake.

In this report we will describe why preserving and protecting wetlands is in the public interest in terms of creating and maintaining a healthy environment for humans and wildlife.

Currently the Utah Inland Port Authority (UIPA) is the single biggest driver of wetland destruction and impairment in the Great Salt Lake Basin.

The industrial development planned and subsidized by UIPA will damage wetlands and surrounding areas in multiple ways. Wetlands and adjacent lands are destroyed and paved over during the building process. The new impermeable surfaces of the development create storm water pollution. New industrial development depletes water resources and creates noise and light pollution. The cars, trucks and locomotives servicing this development generate pollution. All of this combines to make the directly impacted area, as well as surrounding land inhospitable to healthy life.

Given that Great Salt Lake is in crisis and on the verge of ecological collapse, the last thing the state should be doing is subsidizing the destruction of wetlands next to the lake.

On some level the state recognizes the need to protect wetlands, as there are federal regulatory obligations under the federal Clean Water Act. Over the years the state has funded wetland restoration and protection in a variety of ways. And, for example as a part of the Great Salt Lake Watershed Enhancement Trust they have created a “wetland grant program” to conserve and restore wetlands. That program

issued an RFP this year and received requests equaling $18.7 million with the potential to conserve or restore 13,339 acres (note they will only be able to fund *half* of this amount).

Yet at the same time GSL and its wetlands face a crisis. The state is poised, through UIPA, to subsidize with public money the impairment of approximately 42,000 acres of wetlands at locations near or next to Great Salt Lake.

Specifically, the state is busy expediting the destruction of wetlands by creating Utah Inland Port Project Areas in and adjacent to wetlands at a staggering pace.

The History of UIPA

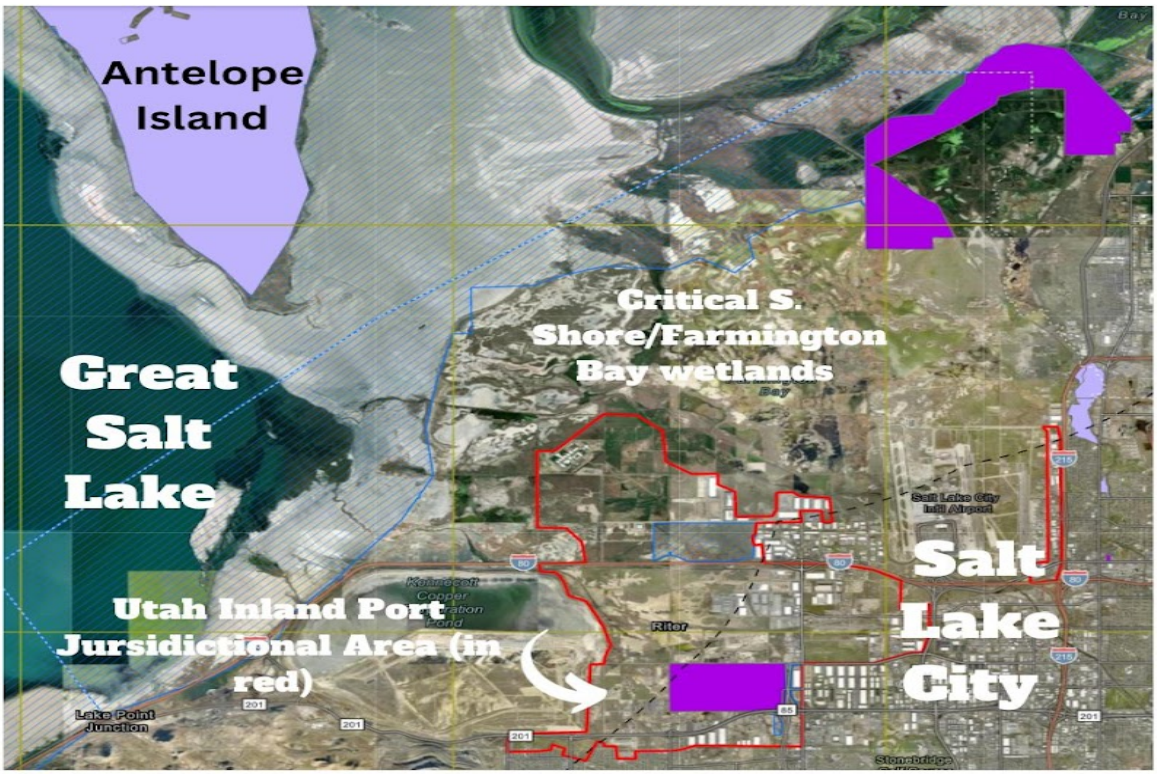
The whole 5 year and 8 month history of UIPA has been fraught. The responsibility for that lies largely with the Utah Legislature. UIPA was created through legislation passed quickly and with little public comment during the 2nd to last evening of the 2018 Utah Legislative Session. At that time UIPA was squarely focused on Salt Lake City and grabbing control over 16,000 acres in the northwest quadrant with a poorly developed concept of what an "inland port" actually is, and what they were planning to do.

In 2019 the UIPA statute was amended to allow for the creation of "satellite ports" at locations outside of Salt Lake City, although again, the concept was vague. In 2021, UIPA launched a misguided plan to build a transloading facility next to the Union Pacific intermodal facility. This idea was also poorly vetted and after bonding for $150 million the project collapsed, leaving UIPA with a monthly lease payment of $120,000 for 40 years.

What is happening now in the Salt Lake City location is a lot of new warehouse construction and all the attendant pollution (eventually this could end up being over 152 million square feet of new warehouse space). All the negative impacts to

Great Salt Lake, the south shore and Farmington Bay wetlands are relevant at the Salt Lake City location.

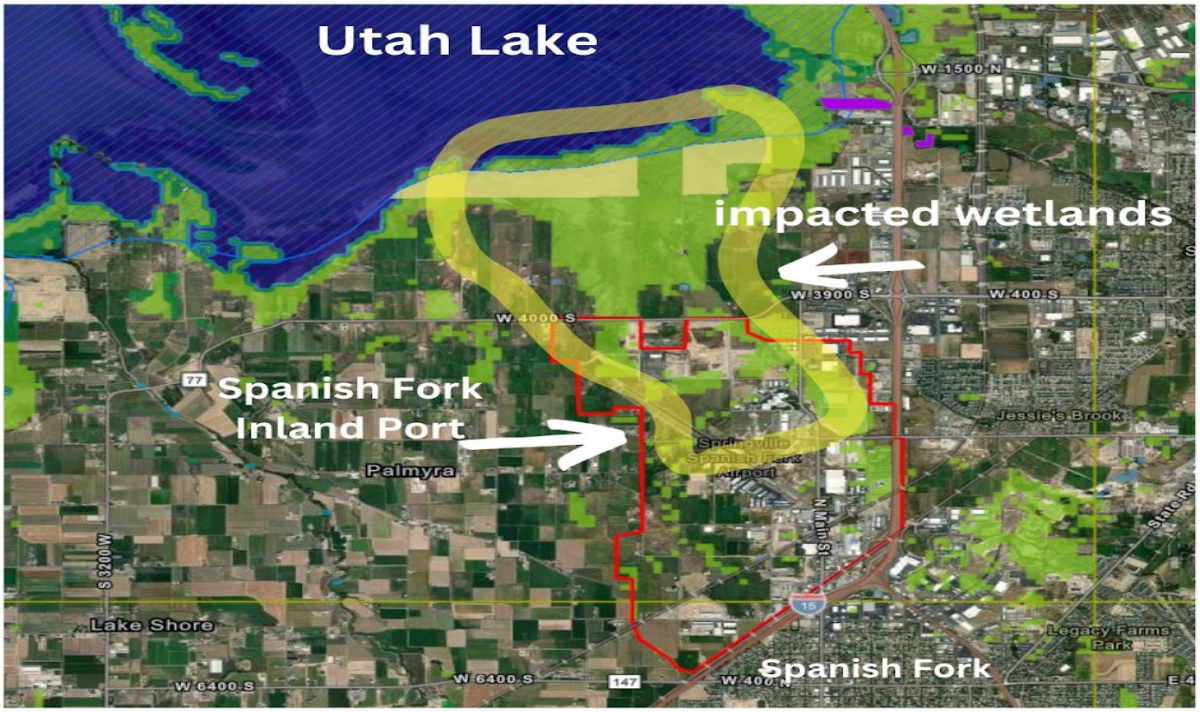
The Salt Lake City "inland port" location is 1.5 miles from GSL. Over 26,588 acres of wetlands could be harmed by this industrial development.



What's happening in 2023? UIPA is expanding harm to wetlands through new and proposed project areas

Spanish Fork: Inland Port in and next to Utah Lake wetlands

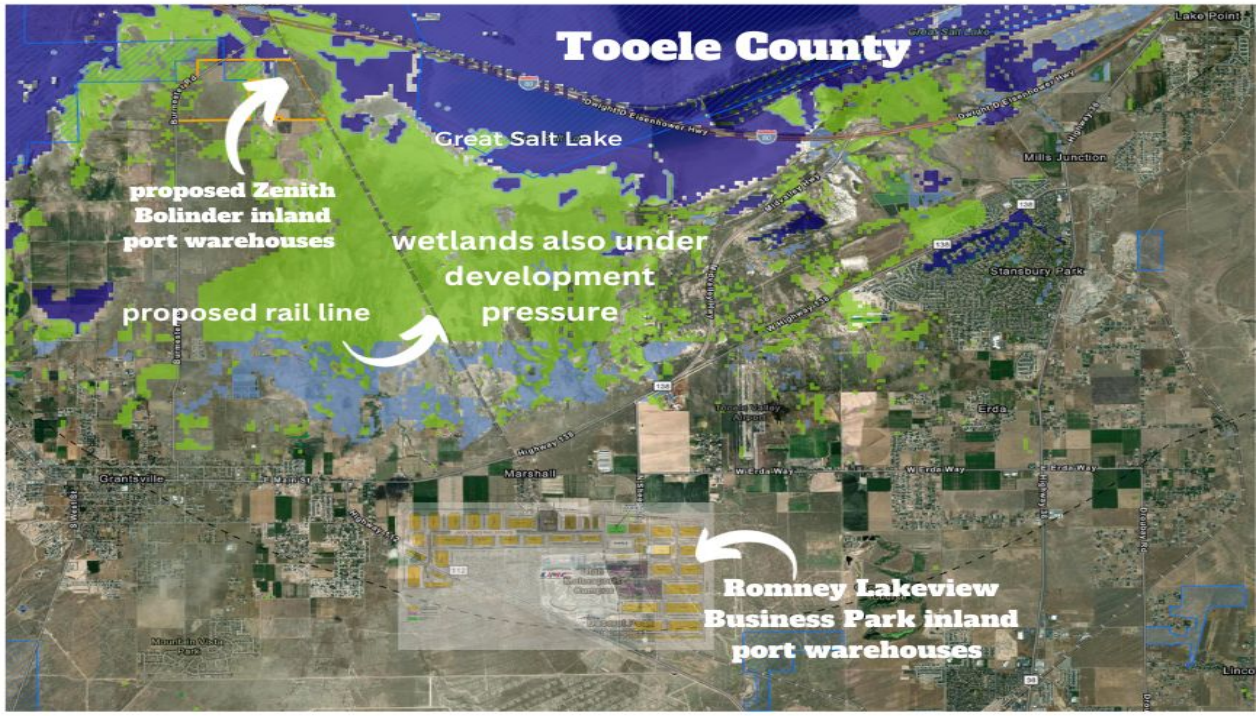
In July 2023, UIPA approved a new project area in Spanish Fork consisting of 2,298 acres riddled with wetlands and adjacent to another approximately 1,200 acres. The project area is 1.3 miles from Utah Lake.



Box Elder County: Inland Port on the doorstep of Bear River Migratory Bird Refuge

In August 2023, [UIPA approved several locations in Box Elder County](), with one location being half a mile from Bear River Migratory Bird Refuge and another having the Malad River running through it. Project areas in and adjacent to wetlands account for about 693 acres located .5 miles from the Bear River Migratory Bird Refuge. Approximately 1,600 acres of wetlands abut the UIPA Project Area.

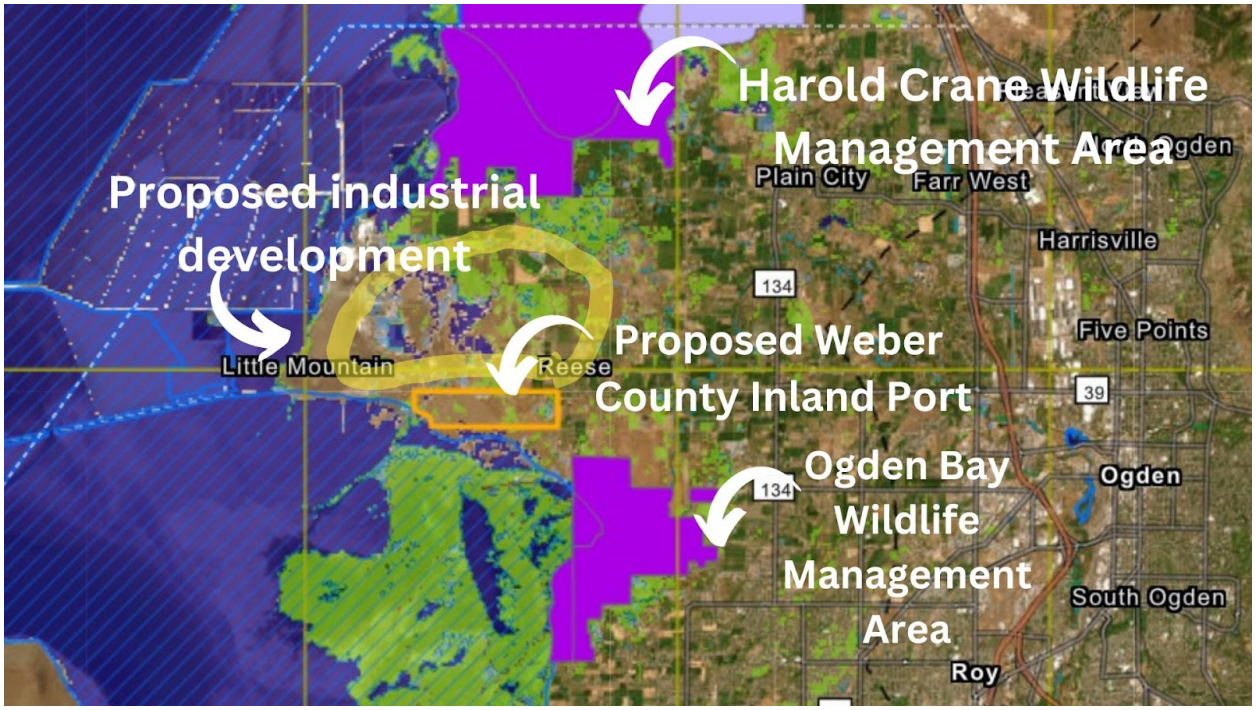
Tooele County: A proposal for a massive subsidized industrial development proposal next to Great Salt Lake and Great Salt Lake wetlands



In October 2023, UIPA introduced 2 draft plans for Tooele County Project Areas, the 163 acre Tooele Valley Project Area , ¼ of a mile from Great Salt Lake, to be developed by Zenith Bolinder (the Bolinders are the father and uncle of Utah State Representative Bridger Bolinder) and the 1,835 acre Grantsville City Inland Port Project Area which is the Lakeview Business Park (LBP) being developed by the Romney Group (owned by Senator Mitt Romney's son Josh). Between the Zenith Bolinder location and the LBP lie 7,000 acres of wetlands also being eyed for industrial development. All locations are within the boundary line for inclusion in the GSLWET wetlands grant program.

Weber County: A proposal for massive industrial development next to Great Salt Lake and next to two state wildlife management areas

In August 2023 the [Weber County Commission passed a resolution supporting a 954 acre inland port project area next to Great Salt Lake](). The project is slated to jump start another 5,000 acres of industrial development to the north. All of this industrial development will be wedged between two state funded wildlife management areas - the Harold Crane Wildlife Management Area and the Ogden Bay Wildlife Management Area.



The estimated cumulative impact of all of these project areas would harm approximately 52,729 acres of wetlands.

For perspective, the Great Salt Lake Watershed Enhancement Trust has announced they've received applications to protect a mere 13,319 acres and they're not going to be able to fund all of that.

Figure 1. Wetland Impact by UIPA Project Area

Location	Status	Project Area Acres	Distance from GSL	Acres inside GSLWET wetlands grant line	Wetland acres abutting project area	Total acres impacted
SLC	Approved 3/18	16,172	1.57 miles	4,832 north of I-80, 3,756 South of I-80	>18,000	26,588
Box Elder	Approved 8/23	693[1]	6 mi from GSL, .5 mi from BRMBR	150	1600	4,302
Tooele	proposed	163[2] 1835[3]	.25 mi	1,997	7,000 to se 3,400 to nw	12,297
Weber	proposed	954	Next to it	944	~5,000	5,944
Sub-total GSL				11,679	37,552	49,231
Spanish Fork	Approved 7/23	2,298	1.3 from UT Lake	NA	~1200	3,498
Grand total GSL Basin		22,115				~52,729

[1] Counting the Brigham City location only
[2] Zenith Bolinder LLC
[3] Lakeview Business Park/Romney Group

Water: How Will Inland Port Industrial Development Impact Water Quality and Quantity

Significant questions exist about the impact of inland port industrial development on water resources, in terms of quantity and quality.

The situation with the SLC Inland Port Jurisdictional Area is a cautionary tale. Because of the confusion and uncertainty created by the state's rush to take control of the area through the creation of UIPA, issues related to stormwater pollution prevention were never worked out and 6 years later there are serious questions about how stormwater pollution is being managed.

Also in the first frenzy of development SLC received multiple applications from developers seeking to build things that would use large amounts of water, such as server farms and bottling plants. One bottling plant intended to use 2 million gallons of water a day. Fortunately SLC passed an ordinance restricting new industrial water users to 200,000 gallons a day.

In some other UIPA project area locations this 200,000 gallons a day cap is mentioned as a goal, but not required. Thus intensive water consumption by industrial users could create considerable harm. In particular UIPA's expansion into Tooele and Weber Counties raises major concerns for Great Salt Lake Wetlands and the water supplies in both.

Great Salt Lake faces ecological collapse due to lack of water

In 2022, Great Salt Lake dropped to a record elevation of 4188'—the lowest level on the state's contingency charts.[4]

[4] https://pws.byu.edu/great-salt-lake

The depletion of water is even more severe than it appears because groundwater is not included in these estimates. Approximately 26 million acre-feet have been lost from the lake itself, but twice that amount is estimated to have been lost from the aquifers around the lake due to water table drop.[5] These empty aquifers could slow the rate of rebound after runoff is increased.

Despite record precipitation in 2023, the lake is still in critical condition at 4192' elevation. This level is considered "adverse" for wetlands, the lake's biology, recreation access, boating, brine shrimp harvesting, mineral extraction, visitor spending, and public safety.[6]

While recent legislative changes to Utah's water management will likely contribute to water conservation in the coming decades, they are not adequate to help the lake through its current crisis. In fact, if legal, financial, and technical support is not provided for water users to implement these changes, the new policies could have little to no influence on Great Salt Lake in 2024 and 2025. For example, conservation in 2022 and 2023 increased streamflow to the lake by less than 100,000 acre-feet, with most conserved water held in reservoirs or consumed elsewhere in the watershed.[7] [8]

Given the current crisis at Great Salt Lake, the public needs more information on how the proposed port expansions will impact GSL's wetlands before the state allows this development.

[5] https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2021JB022020
[6] https://webapps.usgs.gov/gsl/
[7] https://agu.confex.com/agu/fm22/meetingapp.cgi/Paper/1195985
[8] https://www.sltrib.com/news/environment/2022/12/08/water-districts-vowed-send/

The importance of GSL Wetlands

According to the Utah Division of Wildlife Resources, the wetlands surrounding Great Salt Lake are "of international importance." There are approximately 360,000 acres of wetlands below the GSL meander line, in addition to 546,697 acres of open water and 3,540 acres of upland wetlands representing 26% of the 1.37 million acres below the meander line.[9]

As an important zone of transition between uplands and the open water of Great Salt Lake, they serve as an important buffer zone and habitat for wildlife, and provide other ecosystem services including flood control, improving water quality, and facilitating biogeochemical processing.

Similar to the way trees and forests are referred to as the "lungs of the earth," wetlands have been referred to as the "kidneys of the earth" for their ability to filter out pollution from water. Three processes are key to this benefit–sediment trapping, nutrient removal, and chemical detoxification.

Sediment capture allows capture of contaminants like heavy metals because heavy metals are often attached to soil particles. Wetlands can sequester, absorb and utilize excess nutrients like nitrogen and phosphorus carried towards water bodies by agricultural and lawn fertilizers, and sewage and septic systems which help prevent algae and cyanobacteria growth. This ability has prompted many municipalities to build wetlands for that specific purpose.

Because of their low oxygen environment, wetlands feature slow decomposition of organic matter producing extraordinary carbon capture capability. They can store as much as 20-40 times the amount of carbon as agricultural soils, and they can store it for hundreds of years. As such they play an important role in climate

[9] https://ffsl.utah.gov/wp-content/uploads/OnlineGSL-CMPandROD-March2013.pdf

protection.[10]

On the other hand, disturbing or losing wetlands releases that carbon into the atmosphere. Moreover, when wetlands are warmed or disturbed, they release three of the most potent greenhouse gasses, CO2, methane, and nitrous oxide.[11]

Great Salt Lake wetlands support millions of migratory birds as they migrate between northern breeding grounds and winter locations. They also serve as habitat for a large number of nesting birds — including the world's largest breeding population of white-faced ibis and one of western North America's largest breeding colonies of American white pelicans.[12]

According to the US Fish and Wildlife Service, these wetlands are also home to five species of amphibians and reptiles as well as fish (carp, suckers, and catfish), muskrats, and a high diversity of invertebrates.[13]

It is estimated that for every 1-foot decrease in lake levels, approximately 44,000 acres of mudflats are exposed[14], reducing the amount of shorebird habitat.

UGS research indicates that wetlands and springs along the eastern and southern shore and Locomotive Springs along the north shore of GSL are sustained by shallow, unconfined aquifers, which are connected to deep basin fill aquifers.[15] Shallow groundwater levels in wetlands surrounding GSL are affected by drought, declining GSL levels, groundwater pumping and a shift from agricultural water use

[10] Lal, R., Kimble, J., Levine, E. & Stewart, B. Soils and Global Change CRC Press (1995)
[11] USGCRP. Second State of the Carbon Cycle Report. (2018). Available at: https://carbon2018.globalchange.gov/chapter/13/ (Accessed: 21st June 2019)
[12] https://documents.deq.utah.gov/water-quality/standards-technical-services/great-salt-lake-advisory-council/Activities/DWQ-2012-006862.pdf
[13] https://www.researchgate.net/publication/342681911_Great_Salt_Lake_Shorebirds_Their_Habitats_and_Food_Base
[14] https://link.springer.com/chapter/10.1007/978-3-030-40352-2_9
[15] https://ugspub.nr.utah.gov/publications/special_studies/ss-117/ss-117.pdf

to municipal and industrial. Municipal and industrial pumping would further exacerbate the reduction in subsurface inflow during long periods of drought.[16]

Modeling the water budget of fringe wetlands in Salt Lake, Tooele, and Davis counties suggests that subsurface inflow is most affected by long-term drought (20-year).

With so much widespread recognition of the imperative of protecting Great Salt Lake and its ecosystem, inland port development adjacent to GSL Wetlands will be a direct new threat, counter to all other efforts to save the lake.

Tooele County faces significant water related challenges

Unlike other counties in the GSL Region, Tooele County relies on well water and is not part of a water district. The county has been struggling with water issues as these wells are running dry.

Tooele has attempted to improve their condition by using ARPA funding to connect existing wells but county officials have expressed the need to join an existing water district to source water in the future. In January 2023, the town of Stockton in Tooele County was under a building moratorium due to water shortages. Farmers did not plant crops in 2021 and 2022 due to mountain springs drying up.

The wetlands in Tooele Valley have been classified as endangered due to threats from drought and increased development – conditions that have worsened since this classification in 2005. A Tooele Valley wetlands assessment found that wetland hydrology in Tooele has been impacted the most by the numerous roads, canals, and ditches in the area, and that agricultural land use is more beneficial to wetland health and functionality than industrial or urban land use.[17]

[16] https://ffsl.utah.gov/wp-content/uploads/OnlineGSL-CMPandROD-March2013.pdf
[17] https://ugspub.nr.utah.gov/publications/special_studies/ss-117/ss-117.pdf

Weber County also faces significant water related challenges

Despite 2023's record water year, the Weber Basin has been in a historic drought in recent years.

In September 2021, the Davis and Weber Counties Canal Company shut off secondary water supply due to unprecedented drought conditions. This set a record for earliest the company has ever had to shut off water. Shutoffs were incited by the depleted Weber River.[18]

In April 2022, Weber had endured 3 consecutive years in which they received less than 10% of the volume of runoff from snow to keep in reservoirs (~10,000 acre-feet of the average 222,000 af) and reservoirs sat at about 30% of capacity.[19] To compensate for these losses, the Weber Basin Water Conservancy District relied further on groundwater wells but expressed concern about significant drawdown after 4 years of increased pumping.

Before investing public money in these projects, UIPA and their supporters in the legislature must be honest with the public about the harm this will cause to communities and water supplies in both Tooele and Weber Counties. We do not have sufficient data on the groundwater in Tooele and whether the community could even sustain this project without causing irreparable damage to its already threatened water supply.

[18]https://www.fox13now.com/news/local-news/davis-and-weber-counties-shut-off-secondary-water-supply-early-due-to-unprecedented-drought
[19]https://www.deseret.com/utah/2022/4/3/23006424/west-drought-water-restrictions-secondary-culinary-sod-reservoir-storage-water-rights-utah-weber

Other consequences of these wetland based inland port areas of subsidized industrial developments include air pollution, noise and light pollution, and increased use of pesticides.

Pesticide Harm to Wetlands Associated with Expansion of the Utah Inland Port Authority

One of the major concerns associated with expansion of the Utah Inland Port Authority (UIPA) is the likely increase in pesticide use. This is because more people will be working in proximity to large numbers of mosquitoes that thrive in wetlands near the Great Salt Lake (GSL) and other wetlands where new Utah Inland Port projects are being built.

The EPA acknowledges that pesticides are one of the primary pollutants known to degrade wetlands and water quality. The EPA also notes that "although wetlands are capable of absorbing pollutants from the surface water, there is a limit to their capacity to do so". [20] Pesticides can leach into the soil, contaminating ground and surface waters. An influx of pesticides can overwhelm this system, leading to significant damage to aquatic ecosystems. Increased pesticide use could affect a wide variety of species that live in and around GSL wetlands.

The Xerces Society reports that the most commonly used pesticides that kill adult mosquitoes are organophosphates and pyrethroids, and these are also the pesticides most frequently used by the mosquito abatement districts that operate near GSL wetlands.[21] These are broad-spectrum toxins that impact not only the targeted mosquitoes, but also invertebrates, fish, amphibians, birds and insects (including endangered butterflies). Many of these organisms, like midges, are food sources for the millions of migratory birds that depend on the GSL habitat.

[20] https://www.epa.gov/sites/default/files/2021-01/documents/threats_to_wetlands.pdf
[21] https://xerces.org/press/new-report-provides-guidance-on-mosquito-management-that-protects-people-and-wetlands

Pesticides that kill the immature mosquitoes (larvicides) are thought to be less toxic than organophosphates and are widely used near the local wetlands, however these chemicals can also adversely affect the wetland community.

Pesticides that make their way into local water sources throughout Utah, some of which involve freshwater wetlands, pose potential health risks to communities that rely on these sources for drinking water and recreational activities.[22] The US Geological Survey points out that "pesticides released into the environment for agricultural and non-agricultural purposes can contaminate surface water and groundwater, which are critical sources of drinking water."

Although many of the pesticides used in this country dissolve in water, some of them "adhere to sediment and persist for years in the bed sediments of streams and lakes, recording the history of contaminant use in watershed."[23]

Some pesticides break down into by-products that are even more toxic and persist longer in the environment. Not surprisingly, pesticides have been identified as a component of the dust from dry lake beds of GSL, and it's likely these chemicals are part of the toxic dust that is contaminating the air people in the area breathe.[24]

These sources of water and air contamination by pesticides also present serious health risk factors for people living throughout Utah, especially the vulnerable of society--fetuses, infants, and children. In an extensive report about pesticides and health risk, Utah Physicians for a Healthy Environment summed up the problem with this statement: " In recent years numerous medical experts and entire medical societies have made strong position statements regarding the danger to humans of even small doses of chemicals, and their link to obesity, cancer, heart disease, birth

[22] https://geology.utah.gov/water/wetlands/wetlands-in-utah/
[23] https://www.usgs.gov/mission-areas/water-resources/science/pesticides-and-water-qualit
[24] https://utahstatemagazine.usu.edu/environment/toxic-dust-a-growing-problem/

defects, reproductive pathology, and neurological and brain disorders such as Parkinson's, impaired intellect, autism and attention deficit disorder." [25]

Pesticides are at the top of the list of toxic chemicals that humans should avoid. Increasing pesticide use invariably promotes resistance by target insects and plants, which ignites a spiraling chemical arms race, with higher doses and more toxic chemicals required to achieve the same result, accelerating the cascade of biological harm. In short, widespread industrial development of GSL's wetlands stimulated by UIPA would bring more people in daily contact with mosquitoes and increase pressure for more and more pesticide use. The end result will be more harm to the GSL ecosystem, its wildlife, including the birds, and to the residents of the entire state.

[25] https://www.uphe.org/priority-issues/mosquito-pesticide-spraying/

How Industrial Development Impacts People and Wildlife: Noise and Light Pollution

@Scott Baxter

Should these inland ports be developed, the totality of imminent wetland destruction will be staggering. This press to destroy wetlands is in direct contradiction to the state's efforts to save Great Salt Lake and its natural resources. Most of these proposed ports lie within 7 miles of the meander line – an area identified by the state's Great Salt Lake Water Trust as an area that is prime wetland habitat eligible for conservation. The wetlands within the 7-mile-line generally consist of edge habitats that support far more diversity of birds than does the open water of the Lake. Thus, these edge areas are hugely important to the health and survival of the birds and other wildlife that inhabit them.

From 1850 to the 1980s, Utah lost over 30% of its wetlands (Utah Geological Survey). Wetland loss since the 1980s has accelerated due to massive development around the Lake and some experts now estimate that over 90% of the state's original wetlands have been destroyed. The wetlands around Great Salt Lake currently represent 75% of all that remains in Utah (John Luft, GSLEP, September 2023 presentation). Should these ports be developed, we will further degrade and greatly diminish what is left of the habitat that is critical for the 12 million migrating birds that utilize the Lake as an essential stopover. Great Salt Lake is the crossroads of the West for the avian world. It is well understood that these migrating birds will not survive if they cannot access the resources that they have relied on and co-evolved with for millennia.

There are some species at the Lake that represent the majority of the population found in North America and in some instances, the Western Hemisphere. Species that are particularly vulnerable if we lose more habitat at the Lake include the Eared Grebe, the Wilson's Phalarope, the Red-necked Phalarope, the Marbled Godwit, the Snowy Plover, the Northern Pintail, the Tundra Swan, the Green-winged Teal, the Common Goldeneye and the California Gull.

The state's Great Salt Lake Ecosystem Program (GSLEP) has stated that its Great Salt Lake Conservation Objective is to "develop an informed, perceptive and enduring constituency working toward long term GSL ecosystem health and 'harmony between men and land'." UIPA's planned proliferation of industrial development on many of the remaining wetlands of Great Salt Lake countermands that objective.

In addition to wholesale destruction of wetlands, the many planned inland ports around the Lake will cause a dramatic increase in both light and noise pollution. Detrimental human and wildlife health impacts from light and noise pollution have been well documented.

Artificial light exposure at night can negatively affect human health, increasing risks for heart disease, obesity, depression, sleep disorders, diabetes, breast cancer, childbirth complications and more.[26] Plants and animals depend on Earth's daily cycle of light and dark to govern life-sustaining behaviors such as reproduction, nourishment, sleep, and protection from predators. [27]

Migrating birds in particular suffer greatly from light pollution. Artificial light disturbs the birds' ability to navigate by way of the stars and moon. Birds can become confused, lose their way and die. Additionally insects, which are a primary source of food for birds and other animals, are drawn to artificial light and are instantly killed upon contact with those light sources. This again can greatly disturb bird migration and can result in birds arriving too soon or too late to take advantage of the peak insect cycles that are critical for staging, breeding and rearing young. The National Science Foundation reported on a recent study that "found that light pollution causes birds to begin nesting up to a month earlier than normal in open environments such as grasslands and wetlands, and 18 days earlier in forested environments. The consequence could be a mismatch in timing -- hungry chicks may hatch before their food is available." [28] Other studies have documented that noise and light pollution can profoundly alter bird reproduction.[29]

Noise pollution will surely increase at these proposed industrial developments. Inland ports, especially those served by rail, are generally 24/7 operations. Birds are averse to noise and human commotion and will abandon feeding and grounds and nests as a result.[30]

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[26] https://darksky.org/resources/what-is-light-pollution/effects/human-health/.
[27] https://darksky.org/resources/what-is-light-pollution/effects/wildlife-ecosystems/
[28]https://new.nsf.gov/news/noise-light-pollution-affect-breeding-habits-birds#image-caption-credit-block
[29]https://seas.umich.edu/news/large-scale-nest-study-shows-noise-and-light-pollution-alter-bird-reproduction

[30] https://seas.umich.edu/news/large-scale-nest-study-shows-noise-and-light-pollution-alter-bird-reproduction

The totality of wetland habitat loss, artificial nighttime light, noise pollution and human commotion in these areas proposed for inland ports and industrial developments would land a devastating blow to the birds, other wildlife and Great Salt Lake. Given that the state is focused on saving Great Salt Lake and all its biological treasures, it is inconceivable that the state is now considering this massive amount of wetland habitat destruction.

Noise pollution is the second largest environmental cause of human health disorders after air pollution. [31] Unwanted noise is interpreted by the brain as stress, increasing stress hormones such cortisol and epinephrine, raising blood pressure and stimulating the production of inflammatory cells. Over time that accelerates arterial plaque accumulation increasing the risk of stroke and heart attacks.[32] As little as five years of increased traffic noise in particular significantly increases the risk of major cardiovascular events, such as strokes and heart attacks.[33]

Noise of a passing freight train can produce noise that reaches 117 decibels compared to a quiet room of 27 decibels. But the brain's perception of a train's noise is 500 times greater, because the decibel scale is logarithmic, not linear. Loud noise can even trigger immediate heart attacks. The risk of dying from a heart attack increases 4.3% for every 10 dB increase in chronic road traffic noise, starting at just 35 dB.[34]

Night time noise is particularly harmful because it disrupts and fragments sleep even if the person is not aware of it. Noise pollution impairs cognition. When experienced in early childhood it can impair neurologic development, increases the risk of attention deficit disorder, and can have a life-long negative effect on

[31] *https://www.who.int/europe/news-room/fact-sheets/item/noise*
[32] *Münzel T, et al. Cardiovascular effects of environmental noise exposure, European Heart Journal, Volume 35, Issue 13, 1 April 2014, Pages 829–836, https://doi.org/10.1093/eurheartj/ehu030*
[33] *Osborne M, et al. A neurobiological mechanism linking transportation noise to cardiovascular disease in humans, European Heart Journal, Volume 41, Issue 6, 7 February 2020, Pages 772–782, https://doi.org/10.1093/eurheartj/ehz820*
[34] *Vienneau D, et al. Transportation noise exposure and cardiovascular mortality: 15-years of follow-up in a nationwide prospective cohort in Switzerland. Environ Int. 2022 Jan;158:106974. doi: 10.1016/j.envint.2021.106974. Epub 2021 Nov 11. PMID: 34775186.*

education and academic achievement. The noise of trains in an otherwise calm rural or suburban setting can be particularly harmful because there is little ambient noise to dampen the jarring effect.[35]

Concern about noise pollution is particularly germane to UIPA's project areas because they are planned for areas that are currently bucolic and relatively quiet. UIPA claims that one of the reasons why they are focusing on wetlands for project areas is that is where train infrastructure exists. Moreover, distribution warehouses will become centers of truck traffic and its associated noise 24/7. All of this adds significantly to the human health threat to residents of these project areas.

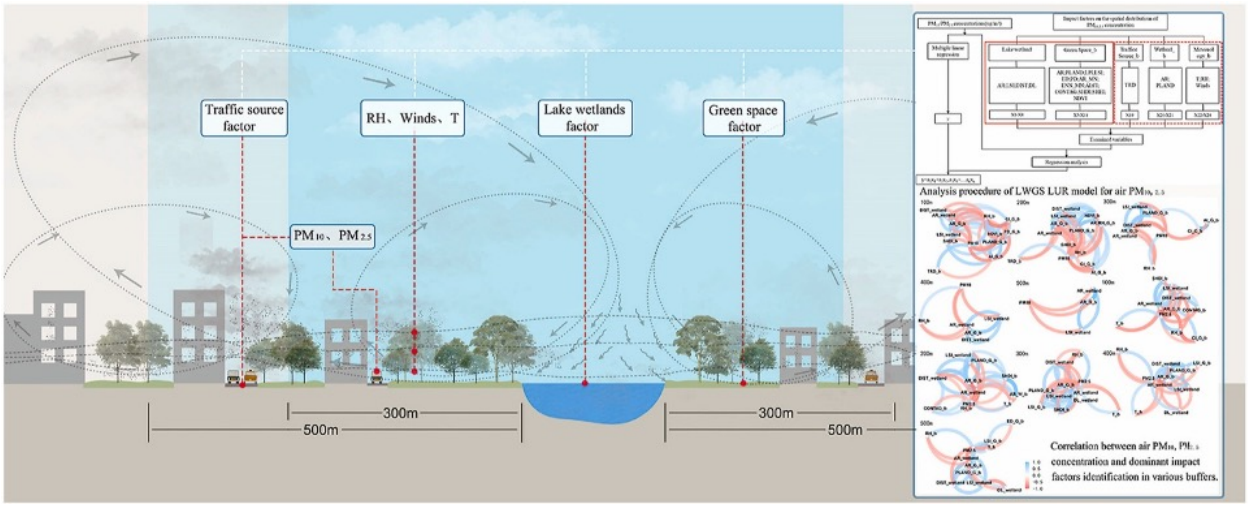
Air Pollution

It is beyond the scope of this report to detail the extent of the human health hazards of current levels of Wasatch Front air pollution. But sacrificing tens of thousands of acres of wetlands throughout the state, especially surrounding the Great Salt Lake, will exacerbate the air pollution exposure of the majority of the state's population.

Wetlands reduce particulate pollution from the airshed (Zhao et al).[36] In fact, the presence or absence of wetlands can be used to predict levels of particulate matter pollution in an area.

[35] *https://www.nytimes.com/interactive/2023/06/09/health/noise-exposure-health-impacts.html*

[36] Zhao L, Li T, Przybysz A, Guan Y, Ji P, Ren B, Zhu C, Effect of urban lake wetlands and neighboring urban greenery on air PM10 and PM2.5 mitigation, Building and Environment, Volume 206, 2021, 108291, ISSN 0360-1323, https://doi.org/10.1016/j.buildenv.2021.108291. (https://www.sciencedirect.com/science/article/pii/S0360132321006909)



(Image credit: see Zhao et al., 2021)

Moreover, wetland restoration is a viable strategy for metropolitan areas to lower PM2.5 levels in very localized areas. For example, smaller wetlands were shown to have a noticeable impact on PM2.5 levels for up to 1,000 meters of the surrounding area. Larger wetlands can have a similar impact on much greater distances.[37]

By increasing relative humidity, wetlands can promote particulate matter settling.[38] Beyond the loss of wetlands, turning tens of thousands of acres of open space and wetlands into seas of asphalt and concrete contributes to air pollution irrespective of the vehicles that travel on them.

Not surprisingly, laying hot asphalt releases toxic VOCs. But even long after, i.e. years, when exposed to sunlight and summer temperatures, asphalt continues to emit toxic VOCs and "secondary organic aerosols" (SOC) which are major components of PM2.5. In fact, this phenomenon was calculated as equal to, or even

[37] Acharya P, Krishna Gayen B, Dutta D. (2022, May). Can wetlands be an effective option to reduce the particulate matter pollution in the air in urban spaces?. NASA/ADS. https://ui.adsabs.harvard.edu/abs/2022EGUGA..24.8380A/abstract

[38] Qiu D, Liu J, Zhu L, Mo L, Zhang Z, Particulate matter assessment of a wetland in Beijing, Journal of Environmental Sciences, Volume 36, 2015, Pages 93-101, ISSN 1001-0742, https://www.sciencedirect.com/science/article/abs/pii/S1001074215002697?via%3Dihub

exceeding the contribution of tailpipe emissions to summertime PM2.5 in Los Angeles.[39]

Obviously, this is a source of pollution that will not be reduced or eliminated by future fleet electrification. Furthermore, recent studies have shown that PM2.5 just from tire, brake, and road surface wear, and other vehicle mechanical friction probably also exceed the PM2.5 from tail pipes. Electric vehicles generally produce more of this category of pollution because they are heavier.

Through another path, water consumption secondary to these project areas will increase ozone formation. Increased water consumption, inherent in all this increased industrial and business activity, will further deplete the size of the Great Salt Lake. The many consequences of that trend include not only the well recognized increased dust storms from the expanded dry lake bed, but also an increased solar reflectivity which is a catalyst for the formation of ozone.

UIPA claims its new project areas will be good for Wasatch Front air quality by shifting goods shipments from trucks to trains. That claim defies all logic and empirical evidence. The whole premise behind them is that a lot more products will be imported and exported. Whether via trains, trucks, or airplanes, that means a lot more pollution.

One example illustrates the point with the proposed project areas in Tooele. The Lakeview Business Park (LBP) commissioned a traffic study intended to estimate vehicular traffic from a fully developed LBP. **That study concluded that just one of the two project areas in Tooele, would generate 50,726 daily vehicle trips at full build out.** Based on the amount of truck traffic per square foot of warehouse space in the Inland Empire, in Southern California, between these two Tooele

[39] *Peeyush Khare et al., Asphalt-related emissions are a major missing nontraditional source of secondary organic aerosol precursors. Sci. Adv.6, eabb9785(2020). DOI:10.1126/sciadv.abb9785*

project areas an additional 30,000 daily truck trips could be generated. Either figure represents a staggering new source of air pollution.

Regarding UIPA's claim that trains in their project areas will improve air quality, consider again the situation in Tooele. The rail line proposed by Savage Rail would, according to their own estimates, run only 22 rail cars per day. The carrying capacity of one rail car is the equivalent of no more than 4 trucks. So a fully operational rail line would only reduce the on road truck inventory by a paltry 88 trucks at the most, not even a proverbial drop in the bucket of the over 30,000 daily truck trips or well over 50,000 vehicle trips modeled in the TIS from just the one industrial zone. So how could anyone claim that the rail line would be responsible for any measurable decrease in air pollution, traffic congestion, or energy consumption compared to no rail line?

But the claim is even more preposterous given the amount of pollution generated by the two diesel locomotive engines. Heavy equipment diesel engines produce enormous amounts of pollution. According to Emissions Based Maintenance (EBM) in Lehi, Utah, diesel mechanics and emissions experts, two tier 0+ diesel locomotive engines will produce the equivalent in direct PM2.5 of what would be expected from 500,000 average cars, equal to half of all the cars registered in the state.

Making the diesel pollution from this proposal even worse are two facts. Unlike automobiles and personal pick-up trucks, engines larger than 750 hp are never inspected once they are on the road or tracks, and there is no state or federal law requiring it. Steve Forbush, owner of EBM, states that in their experience these diesel engines in the real world perform even worse. Furthermore, diesel engines produce a disproportionate amount of ultrafine particulate matter (UFP), by far the most toxic subset of the inventory of atmospheric particulate matter. Importantly, UFP contributes only a negligible amount to PM mass measured at PM2.5 monitors

within Utah's and the nationwide EPA network, but dominates the particle number, which is the most relevant metric of PM human health toxicity.[40]

UIPA is aggressively selling a narrative to rural communities that its project areas will "fast track growth in your communities." Obviously that growth will also fast track traffic congestion, air, noise, water, and light pollution, and more water demand, directly contradicting their own claim about improving Wasatch Front air quality and ignoring all the other environmental consequences.

In short, almost regardless what kind of businesses populate these new "project areas," the increase in industrial activity via sacrificing tens of thousands of acres of wetlands, will stimulate increased population growth, increased vehicular traffic throughout Wasatch Front road ways, increased train and airplane traffic, and increased water consumption. All this will increase the overall air pollution burden on the Wasatch Front.

Conclusion

The public harm caused by publicly subsidized state sponsored UIPA industrial development will be substantial. A conservative estimate is that approximately 52,729 acres of wetlands will be lost through UIPA's activities in the Great Salt Lake Basin. Specifically, on the shores of Great Salt Lake, 49,231 acres are in harm's way from UIPA incentivized development.

As we've described in this report the wetlands impact on their own are enormous and so too are impacts to depletion of precious water resources, pollution of water and air, as well as increased pesticide use, noise and light pollution.

There is a real possibly that this UIPA financed industrial development in wetlands will inflict environmental health harms that violate federal environmental laws such

[40] *Seny Damayanti, Roy M. Harrison, Francis Pope, David C.S. Beddows, Limited impact of diesel particle filters on road traffic emissions of ultrafine particles, Environment International, Volume 174, 2023* https://www.sciencedirect.com/science/article/pii/S0160412023001617

as the Endangered Species Act, the Clean Water Act, the Clean Air Act and and other federal environmental protection laws.

As the public harm from these publicly subsidized industrial projects is significant, the project areas being proposed should be shelved and the project areas already established should be rolled back.