

Regional Economic Values of the Bear River



December 2023

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Acknowledgements: We would like to acknowledge and thank the following individuals for providing valuable input: Connelly Baldwin, Matt Coombs, Nathan Daus, Eve Davies, Michael Dunphy, Lara Gale, Erica Hansen, Erin Holmes, Paul Jakus, Jeremy Jirak, Jack Kolkman, Don Leonard, Matt Lucia, Bethany Neilson, Jeffrey Ostermiller, Max Pierce, Brett Roper, Matt Schenk, Jake Serago, Mark Stenberg, Karleen Vollherbst, and Marisa Weinberg. We appreciate the numerous land managers and Bear River stakeholders, not listed, who helped us understand the Bear River and its local communities. Thanks to Dr. John Loomis for project advice, Barrett Lewis and Leah Dunn for GIS work, and Lucy Holtsnider for report design. Any errors, and all research findings are attributable to the authors only.

This report was commissioned by Cache Water District, Bear River Water Conservancy District, Utah Division of Water Resources, Great Salt Lake Advisory Council, Box Elder County, Blacksmith Fork Conservation District, North Cache Conservation District, Northern Utah Conservation District, Bear River Water Users Association, and Cache County.

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EXECUTIVE SUMMARY

The Bear River is an important component of life in the Bear River Watershed; the River provides water for agriculture, municipal and industrial uses, hydropower, recreation opportunities, and valuable ecosystem services. The Bear River is hydrologically connected to Bear Lake and the Great Salt Lake and is thus tied to the health and function of these two critically important water bodies. Understanding how the Bear River contributes to the regional economy can aid the development of policies that ensure a sustainable economic future for Bear River communities. Conservation Economics and ECONorthwest were commissioned to conduct a full economic valuation of the Bear River system detailing current economic conditions and illustrating potential effects resulting from future climatic and land use scenarios.

To assess the total economic values of the Bear River, we conducted market and non-market valuations of six primary categories of economic value dependent on Bear River water: agriculture (crops and livestock), municipal water use, hydropower, recreation, heritage, and environmental services. For market values, we use IMPLAN economic modeling software to estimate regional economic impacts and contributions from sales of goods and services that would likely not exist in the region without the Bear River. In addition to regional market values, we estimate the non-market values associated with environmental services and outdoor recreation. The regional economic zone for the Bear River Basin is inclusive of 10 counties in the states of Utah, Idaho, and Wyoming that contain the Bear River and its primary tributaries. The majority of the goods and services derived from Bear River water are exported out of this 10-county regional economic zone to surrounding metro areas (e.g., Salt Lake City and Pocatello), throughout the Pacific Northwest, and even internationally. All dollar amounts in the summary and throughout the report are presented in 2022 dollars, using the Consumer Price Index to account for inflation when necessary. All calculated values are annual values.

Much of the Bear River Basin (850,000 acres) is used for agriculture (both livestock and crop production) with 75% of these lands being irrigated. Thus, the majority of withdrawals from the Bear River system are for agricultural purposes. For Bear River agriculture we found that:

- Bear River agriculture accounts for approximately 1.3 to 2.6 million acre-feet of diverted water annually. A significant portion of irrigation water (estimated at up to 38%) stays within the Bear River Basin via groundwater and surface recharge and irrigation return flows, especially in areas where surface or flood irrigation is used.
- Bear River irrigation is the impetus for almost all sales of crops and livestock in the region. Bear River Basin crops generate \$510 million in annual revenues. Bear River Basin livestock and livestock product sales generate approximately \$350 million in annual revenues.
- Approximately 70% of all crop and livestock annual revenue come from products exported outside of the 10-county Bear River regional economic zone. The majority of exports go to neighboring counties and Intermountain West states.

With the Bear River contributing approximately 39% of water entering the Great Salt Lake (Utah Division of Water Resources), we assume 39% of the estimated Great Salt Lake economic values are attributable to the Bear River. This attribution is done to recognize that when Bear River water quality and levels fall below specific thresholds, Great Salt Lake economic values also are diminished.

Based on prior research investigating the economic value of the Great Salt Lake, we show that:

- Bear River water accounts for approximately \$372 million (39%) of annual Great Salt Lake industrial mineral revenues (e.g., magnesium, titanium, salt, potash).
- Bear River water supports \$18.5 million (39%) of annual revenues associated with Great Salt Lake aquaculture industries (e.g., brine shrimp).

The use of Bear River water for municipal and other industrial activities (aside from agriculture) was examined. For municipal and industrial water use, we found that:

- There is very little non-agricultural industrial use of Bear River water. For municipal water use, most Bear River Basin municipalities rely primarily on groundwater sources, suggesting little of municipal and industrial water is withdrawn directly from the Bear River.
- Bear River Basin municipalities and industries use roughly 50,000 to 132,000 acre-feet of water each year (average of 91,000 ac-ft/year) mostly from groundwater and surface springs – equal to 4% to 5% of Bear River water diverted for agriculture. The relationship between groundwater sources and Bear River surface water is not well documented (e.g., the use of deep groundwater sources may contribute to Bear River flows while other groundwater uses may diminish Bear River flows).
- Average annual sales of municipal water in the Bear River Basin, primarily from groundwater and surface springs, are estimated at \$63.6 million (91,000 ac-ft/year at \$700/ac-ft).

The generation of hydroelectric power is a historical use of the Bear River and provides substantial renewable energy to Bear River communities. PacifiCorp owns and operates five hydropower facilities on the Bear River: Soda, Grace, Oneida, Cutler, and Last Chance. Regarding Bear River hydroelectric plants, we found that:

- Total annual net generation from the facilities averages more than 200 thousand megawatt hours.
- Annual sales of Bear River hydroelectricity are approximately \$18.2 million.
- Approximately 90% of Bear River hydropower is used within the region, while the remaining 10% is exported outside the region.

The Bear River also affords a multitude of recreation opportunities. Each year, an estimated two million visits are made to primary Bear River recre-

ation sites. When non-locals visit the area to recreate and engage in nature tourism, the money they spend on gear, lodging, restaurants, etc. impacts the region's economy in a similar manner as the export of agricultural products. An examination of Bear River related outdoor recreation reveals:

- Primary recreational activities of the Bear River system include boating, hiking, beach-lounging (Bear Lake), wildlife viewing (especially birding), fishing, waterfowl hunting, and camping.
- Non-locals visiting for the primary purpose of outdoor recreation spend nearly \$74 million annually in communities near the Bear River.
- The Bear River portion of Great Salt Lake annual recreation expenditures is estimated at \$41 million.
- Bear Lake is a significant vacation destination for visitors from Salt Lake City, Pocatello, and other Western cities. Recreation and visitation to Bear Lake represents approximately half of all Bear River-related visits and annual expenditures.
- Recreationists who participate in waterfowl hunting, fishing, boating, and birding along the Bear River derive \$16.6 million in annual non-market benefits.

The history and settlement of the Bear River Basin has resulted in significant cultural and heritage values. These values are primarily non-market and qualitative in nature, though we do document market values previously estimated related to Bear River heritage tourism.

- Remembrance of the Bear River Massacre in 1863 and pre-settlement culture has immeasurable value to the Shoshone and other Native American Tribes.
- Historical homesteading, farming, and ranching in the Bear River Basin has tremendous heritage values, particularly for ancestors of Mormon settlers.
- The Bear River Heritage Area draws visitors interested in exploring the Basin's rich culture, heritage, and history. An estimated 326,250 visits are made to Bear River Heritage Area sites each year (excluding Bear Lake), resulting in \$27 million in annual regional visitor expenditures.

The Bear River provides myriad environmental services, such as fish and wildlife habitat, ecological functions, scenic attributes, and spiritual inspiration. Primary environmental services of the Bear River, like the provision of clean and consistent water, are key ingredients for the production of marketed goods, but also spur numerous non-market values – values stemming from goods and services for which there is no market. In the environmental services section, we examined non-market values of the Bear River and found:

- As demonstrated by numerous non-market economic valuations of other rivers, wetlands, and lakes in the American West, regional households are likely willing to pay to restore and protect the Bear River, typically for passive use values related to existence, option, and bequest values.
- For the restoration and protection of two degraded and important sections of the Bear River, we estimate an annual willingness to pay of \$28.6 million.
- We estimate an annual willingness to pay for Bear River wetlands protection of \$3.7 million.
- Attributing 39% of the Great Salt Lake’s value to the Bear River yields an estimated annual willingness to pay of \$52.6 million to protect the Bear River’s portion of the Great Salt Lake.
- Conservation easements are being enacted to protect Bear River environmental services, with more than 11,000 acres in the Bear River Basin protected under easements over the last four years, generating \$2.76 million annually (these are included in our market analysis).
- The Bear River Basin conservation easements also are estimated to provide \$51.6 million of regional annual ecosystem service benefits, or additional non-market values at the current pace of easement purchases.

Aggregating each Bear River value category reveals almost \$1.5 billion in total annual market revenues and \$153 million in annual non-market values (see Table ES1).

Table ES1: Annual Market Revenue and Non-Market Values by Bear River Value Category

Bear River Value Category	Market Revenue	Non-Market Value
Crops	\$510,005,000	
Livestock	\$351,070,000	
Great Salt Lake Minerals	\$372,000,000	
Great Salt Lake Aquaculture	\$18,500,000	
Municipal and Industrial	\$63,570,000	
Hydropower	\$18,240,000	
Recreation	\$115,000,000	\$16,650,000
Cultural/Heritage Tourism	\$27,210,000	
River Restoration/Protection		\$28,610,000
Wetlands		\$3,710,000
Great Salt Lake Protection		\$52,650,000
Conservation Easements	\$2,760,000	\$51,600,000
Total	\$1,471,145,000	\$153,220,000

Additional regional market impacts are spurred by exported goods and services when this new wealth requires supporting services (known as indirect effects) and induces new household spending (induced effects). When adding indirect and induced effects from exported goods to our direct effects from exported and non-exported goods, we get total annual regional economic impacts and contributions of the Bear River (e.g., \$1.80 billion in total output). Finally, we add our annual non-market values (approximately \$153 million) to the total output to illustrate market and non-market values of the Bear River. **A conservative estimate for the total annual value afforded by the Bear River is \$1.95 billion.**

Table ES2: Total Annual Regional Economic Values of the Bear River

Annual Values	Total Employment	Total Labor Income	Total Output/Value
Market Impacts and Contributions	11,428	\$403,270,000	\$1,795,890,000
Non-Market Values	--	--	\$153,220,000
Totals	11,428	\$403,270,000	\$1,949,110,000

The numerous benefits and values afforded by the Bear River are dependent upon sufficient streamflow and sufficient water quality, both of which are currently at risk due to increased demands on water supplies, numerous and widespread water quality impacts, and recent drought conditions in the Intermountain West. We found that:

- Bear River streamflow has decreased considerably over the last 50 years; at the Corrine gage streamflow has declined more than 40% from 1971 to 2021.
- Much of the Bear River is impaired (303(d)-listed), with nearly all samples taken at Corrine showing pollutant levels that exceed phosphorus water quality indicators leaving most of the Bear River unable to meet its aquatic life designated uses. Water quality concerns are amplified by decreases in streamflow.
- Climate change is expected to decrease the region's available water supply and increase temperatures, thereby exacerbating trade-offs between water users and associated economic activities.

Population growth, development, and climate change pose significant threats to the Bear River, Bear Lake, the Great Salt Lake, and the human communities and natural ecosystems that rely on them. Trade-offs between water users have impli-

cations for economic values associated with the Bear River. If additional water is allocated to support population growth and residential development, less water will be available for other uses such as agriculture, hydropower, and recreation. Water supply constraints in the Bear River Basin are already creating upward pressure on the value of water; water rights values in the region have risen sharply during recent years and are currently estimated to be between \$150 and \$2,000 per acre-foot annually. Rising water rights values are increasing interest in water conservation methods and water development projects.

In summary, the Bear River has many beneficiaries, ranging from business owners and the people that are employed due to the presence of the Bear River, to the local communities that receive secondary water and low-cost renewable hydropower, to the consumers of Bear River goods and services far and wide, to the people that recreate in the Bear River watershed, and to the public that appreciate the Bear River and would like to bequeath a healthy Bear River to future generations. However, the sustainability of the Bear River, and its associated economic values, are at risk of being diminished if Bear River flows are reduced and if Bear River water becomes too degraded.