

Regional Economic Values of the Bear River

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Why did we conduct this study?

Utah political leaders pressured to move quickly to save Great Salt Lake

Gov. Cox issues proclamation suspending new water diversions in Great Salt Lake basin

Why saving the Great Salt Lake is vital for global food security

Sacrifices' will need to be made from Bear River water supply to help Great Salt Lake

Why it matters that the Great Salt Lake will likely drop to a new historic low this year

Is the agriculture industry doing enough to conserve water during Utah's drought?

: "cut agricultural use by 90% because that's what's actually devouring all the water...not lawns."

It doesn't make sense to me forcing the alfalfa to grow in the desert by bathing it with scarce water

Alfalfa should be banned. People do not eat alfalfa

Time for the Feds to step in and imminent domain these farms.

Time to get away from Cattle production, which wastes soooo much water

No. They are not doing enough. It is time to adapt crops for the current climate and stop selling alfalfa to China.

The solution is obvious but expensive. The state will need to buy water rights from farmers, decreasing the production of alfalfa first. Hopefully, lab produced meats will decrease the demand for beef on the hoof.

So no one likes beef products, milk products, cheese products leather items or ice cream, yogurt, shakes, hamburgers, salad dressing, cereal, etc. etc. etc.

The better question is "is society doing enough to protect the agriculture industry. Try living without food.

Why did we conduct this study?

- This study was intended to quantify the values of the Bear River to the rural economies highly dependent on the river's water, and the Great Salt Lake
- There is a need to efficiently use water from the Bear River, both maintaining Great Salt Lake and the upstream communities. This study was intended to provide data to more fully describe the value of the Bear River.
- As we look for solutions to maintain a resilient water supply in the Bear River basin, we need to understand the values that water provides to all uses.
- The Bear River contributes approximately 39% of water entering the Great Salt Lake but also forms the foundation of the economies of the 10 counties through which this river flows. (this % varies significantly year to year)

Funding and partners

- Cache Water District, Bear River Water Conservancy District, Utah Department of Water Resources, Cache County, Box Elder County, Great Salt Lake advisory council, Bear River Water Users Association, Blacksmith Fork Conservation District, North Cache Conservation District, Northern Utah Conservation District.
- We appreciate the numerous land managers and Bear River stakeholders, not listed, who helped us understand the Bear River and its local communities
- Conservation Economics and ECONorthwest conducted the study.

Study area

The Bear River Basin is situated at the intersection of Northeastern Utah, Southeastern Idaho, and Southwestern Wyoming. Spanning an area of approximately 7,500 square miles, the Bear River and its primary tributaries traverse 515 miles across three states and ten counties in Utah, Wyoming, and are the basis of the study area used for our economic valuations. Although the Bear River doesn't flow through Oneida County, Idaho, the County is included in our study area due to the presence of Bear River tributaries and the use of Bear River water for irrigation purposes within the County. The 2021 total population for all ten counties is 305,108.5 In general, the Bear River region is a rural and agricultural-dependent region, especially in Idaho, but is within relatively close proximity to more populated areas such as the Wasatch Front and Salt Lake City to the South and Pocatello to the North.

Study Area



The primary categories of economic value

- Agriculture, including ranching and crop production;
- Municipal and industrial water use;
- Hydropower production;
- Water Supply to Great Salt Lake;
- Outdoor recreation, including water sports, wildlife/bird viewing, fishing, and hunting;
- Cultural values, including aesthetics, historical importance, and heritage values;
- Environmental services, including biodiversity protection, biophysical processes (supporting and regulating ecosystem services), air quality, and water quality.

Agriculture.

- 850,000 acres, 630,000 acres are irrigated, half of these are in Idaho, %42 in Utah and %8 in Wyoming. Diverting around 1,260,00 acre feet and depleting an estimated 820,000 acre feet each year.

Crop Type	Idaho	Utah	Wyoming	Total	Percent of Total
Alfalfa	114,161	96,854	9,101	220,116	35%
Grass Hay	63,799	64,422	34,428	162,649	26%
Pasture	24,166	51,073	22,734	97,973	16%
Winter Wheat	12,557	25,346	-	37,903	6%
Corn	7,652	24,785	-	32,437	5%
Barley	21,897	5,472	637	28,006	4%
Fallow/Idle	7,967	5,755	1,546	15,268	2%
Spring Wheat	11,407	782	22	12,211	2%
Potato	7,915	342	-	8,257	1%
Oats	2,033	931	826	3,790	1%
All Other Crops	4,103	7,021	-	11,124	2%
Total	277,657	282,783	69,294	629,734	100%

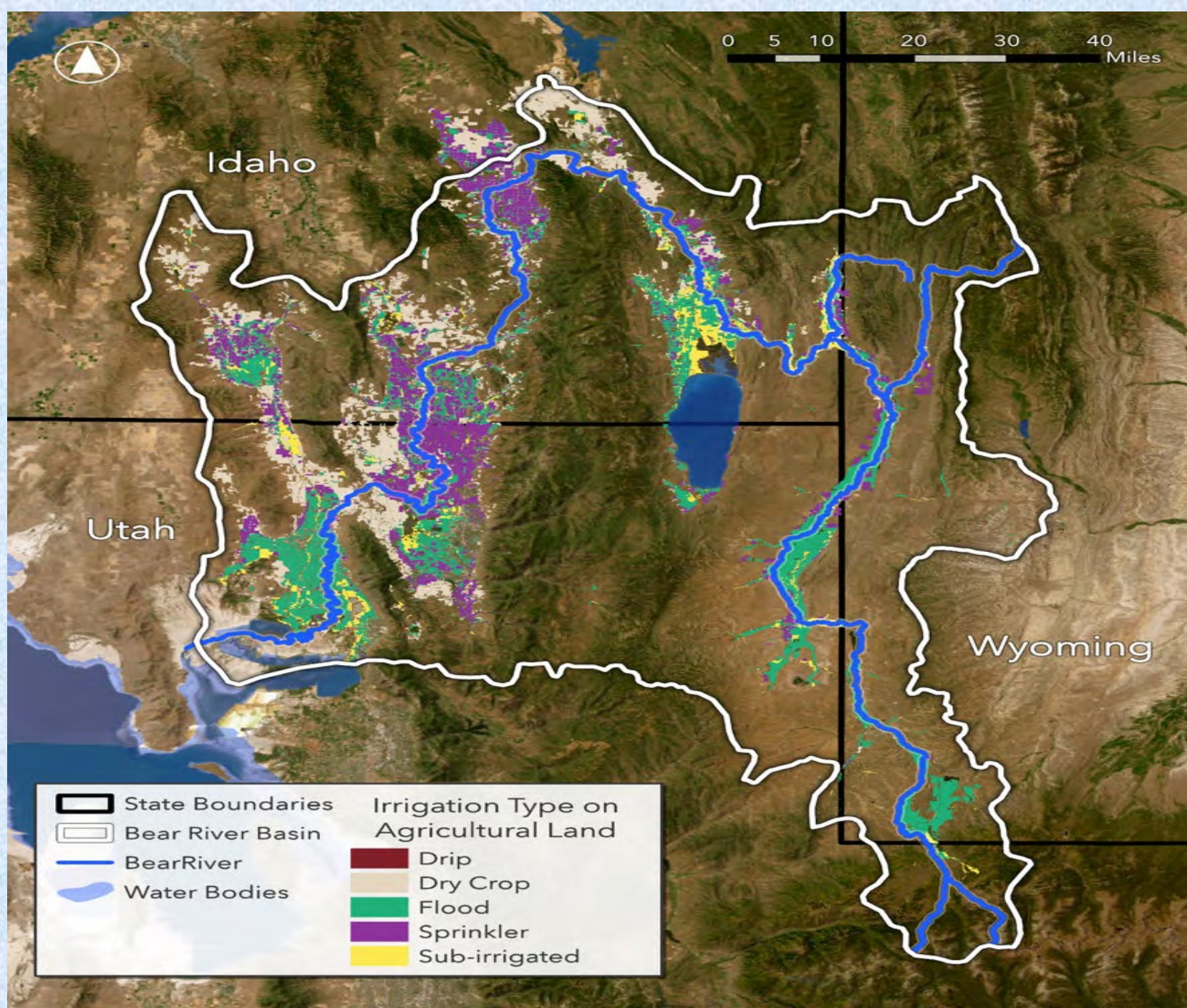


Table 7. Average Total Annual Irrigated Crop Revenues (in thousands of \$2022) in the Bear River Basin

Crop Type	Idaho	Utah	Wyoming	Basin Total
Alfalfa Hay	\$140,889	\$124,829	\$10,623	\$276,341
Grass Hay	\$37,915	\$37,096	\$18,360	\$93,372
Pasture	\$1,377	\$2,835	\$1,671	\$5,883
Winter Wheat	\$9,815	\$21,331	\$0	\$31,146
Barley	\$12,232	\$2,123	\$340	\$14,695
Fallow/Idle	\$0	\$0	\$0	\$0
Spring Wheat	\$9,413	\$834	\$19	\$10,266
Corn	\$8,236	\$26,090	\$0	\$34,325
Potatoes	\$32,806	\$629	\$0	\$33,435
Oats	\$602	\$389	\$342	\$1,333
All Other Crops	\$3,926	\$5,283	\$0	\$9,209
Total Annual Value	\$257,211	\$221,439	\$31,356	\$510,005

The Bear River Basin has a large livestock industry. In 2017 the counties that compose the Bear River Basin had over 387,000 head of cattle and calves that generated \$243 million in cattle/calf sales and \$157 million in milk sales. The ten counties that compose the Bear River Basin are also major producers of sheep and lambs; in 2017 the counties had 131,241 sheep and lambs that yielded \$24 million in revenues.

Table 8. County Level Livestock Count and Revenues (thousands of \$2022)

Source: National Agricultural Statistics Service. (2017). 2017 Census of Agriculture, County Profile. www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/

	Cattle and Calves			Sheep and Lambs	
	Livestock Count	Animal Revenue	Milk Revenue	Livestock Count	Revenue
Utah					
Box Elder	78,614	\$44,573	\$36,395	46,914	\$7,931
Cache	57,695	\$33,837	\$74,817	2,685	\$548
Rich	39,726	\$21,290	\$0	7,501	\$0
Summit	18,707	\$13,613	\$0	12,603	\$3,026
Idaho					
Bear Lake	28,175	\$17,146	\$4,571	6,175	\$216
Caribou	25,146	\$32,080	\$4,602	2,186	\$313
Franklin	33,532	\$11,372	\$35,114	664	\$138
Oneida	23,388	\$14,670	\$0	305	\$73
Wyoming					
Lincoln	43,358	\$33,111	\$1,996	20,090	\$6,334
Unita	38,737	\$21,188	\$0	32,118	\$5,506
Total	387,078	\$242,880	\$157,495	131,241	\$24,085

The Bear River Basin agricultural sector is a sizeable water user; between 1.3 and 2.6 million acre-feet of Bear River water are annually diverted for agriculture. An estimated %38 of the diverted water stays in the basin via irrigation return flows and groundwater recharge.

Sales of agricultural products generate over \$860 million in annual revenues.

Much of the agricultural production is exported outside the counties containing the Bear River.

Alfalfa	1,320,696 tons
Grass Hay	455,417 tons
Pasture	293,919 AUMs
Wheat	6,013,680 bushel
Corn	6,649,586 bushel
Barley	2,436,522 bushel
Potato	2,683,525 lbs.
Oats	322,150 bushel
Milk	140,620,000 gallons

Table 11. Bear River Basin Communities, Population and Municipal Water Source

Community	Population	Municipal Water Source	Water Plan Source
Logan, UT	52,420	Wells, Springs	Logan City, 2020
Brigham City, UT	19,373	Wells, Springs, Surface	Brigham City Corporation, 2019, Utah Department of Natural Resources, 2020
Smithfield, UT	13,263	Wells, Springs	Smithfield City, 2013
Evanston, WY	11,802	Surface Water	The State of Wyoming Water Development Office, 2012
North Logan, UT	10,705	Wells, Springs, Surface	Cache-Landmark Engineering, 2019
Tremonton, UT	9,727	Wells, Springs	Hansen, Allen, & Luce, 2017
Hyrum, UT	9,330	Wells, Springs	Hyrum City, 2022
Providence, UT	8,199	Wells, Springs	Providence, 2022
Nibley, UT	7,160	Wells	Jones and DeMille Engineering, 2019
Preston, ID	5,545		NA
Perry, UT	5,444	Wells, Springs	Bear River Water Conservancy District, 2017
Hyde Park, UT	5,116	Wells, Springs	Sunrise Engineering, Inc., 2023
Wellsville, UT	4,036		NA
Soda Springs, ID	3,084	Wells, Springs	City of Soda Springs, 2020
Richmond, UT	2,881	Wells, Springs	Richmond City, 2020
Montpelier, ID	2,610	Wells	Montpelier Planning and Zoning Commission, 2002
Garland, UT	2,559	Springs	Bear River Water Conservancy District, 2017
River Heights, UT	2,156	Wells	River Heights City, 20203
Malad City, ID	2,112	Wells, Springs, Surface*	Utah Dept. of Natural Resources, 2020.
Lewiston, UT	2,043	Wells, Springs (Surface)	JUB Engineers, 2021
Millville, UT	1,844	Wells, Springs	Millville City, 2016
Willard, UT	1,813	Wells, Springs	Bear River Water Conservancy District, 2017
Honeyville, UT	1,665	Wells, Springs	Bear River Water Conservancy District, 2017
Elwood, UT	1,496	Wells, Springs, Surface	Elwood Town, 2022, Utah Department of Natural Resources, 2020
Grace, ID	1,356	NA	
Mendon, UT	1,317	Wells, Springs, Surface	Utah Department of Natural Resources, 2020
Mantua, UT	1,075	Wells, Springs	Bear River Water Conservancy District, 2017

*USGS. (2019, June 8). Springs and the Water Cycle. www.usgs.gov/special-topics/water-science-school/science/springs-and-water-cycle

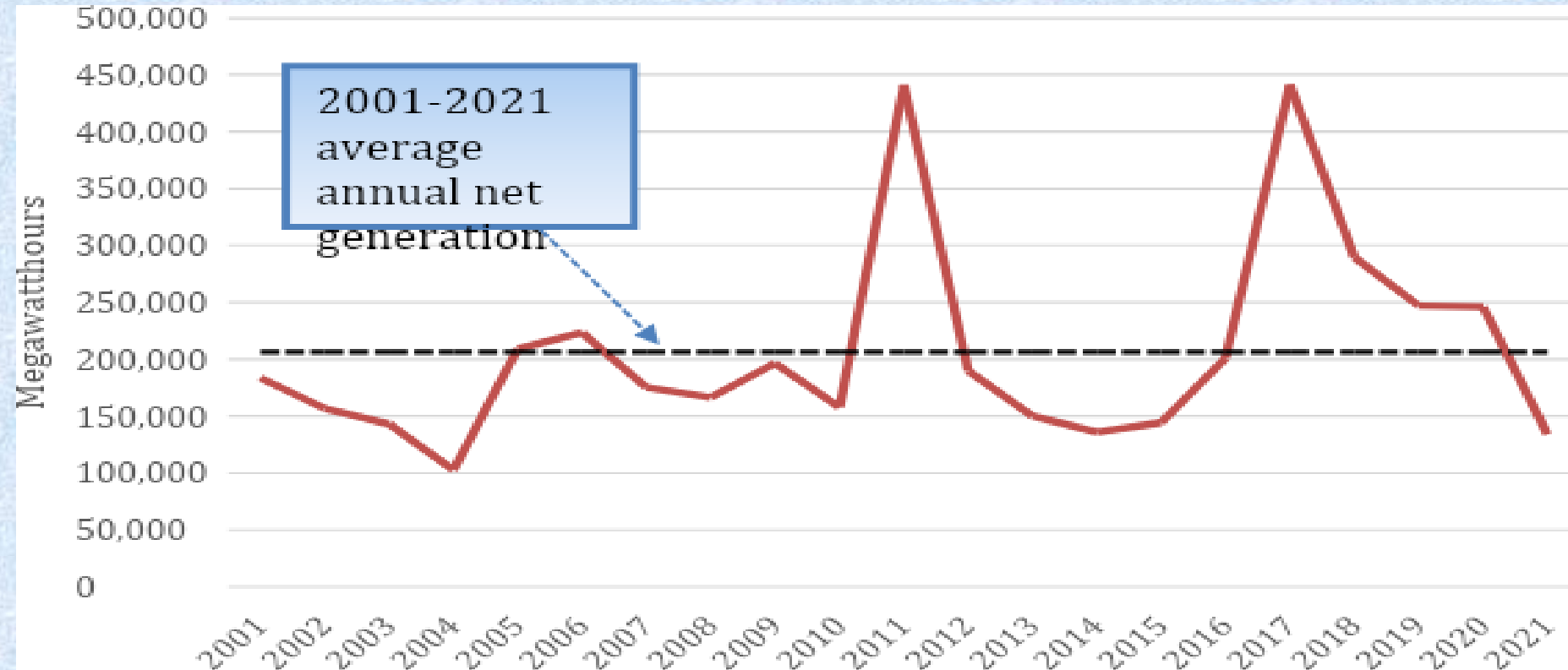
Table 12: Estimated Municipal and Industrial Water use in the Bear River Basin

	Gallons per Capita per Day (GPCD)	
	Low	High
Basin Population	210,604	210,604
Residential Water Use (GPCD)	150	220
Total Estimated Residential Water Use (Gallons per Day)	31,590,600	46,332,880
Non-Residential Water Use (GPCD)	60	340
Total Estimated Non-Residential Water Use (Gallons per Day)	12,636,240	71,605,360
Total Estimated Municipal Water Use (Gallons per Day)	44,227,000	117,938,000
Total Estimated Annual Water Use (Acre-Feet per Year)	49,534	132,091

Estimated total annual municipal and industrial water consumption is 50 to 132 thousand acre-feet per year, depending upon water conservation practices, generating approximately \$63.6 million in annual revenue.

Hydropower generation

Figure 7. Annual Bear River Hydropower Net Generation, 2001-2020



Source: U.S. Energy Information Administration Electricity Data Browser

Bear River hydropower generates an estimated \$18.2 million in annual revenues.

Recreation

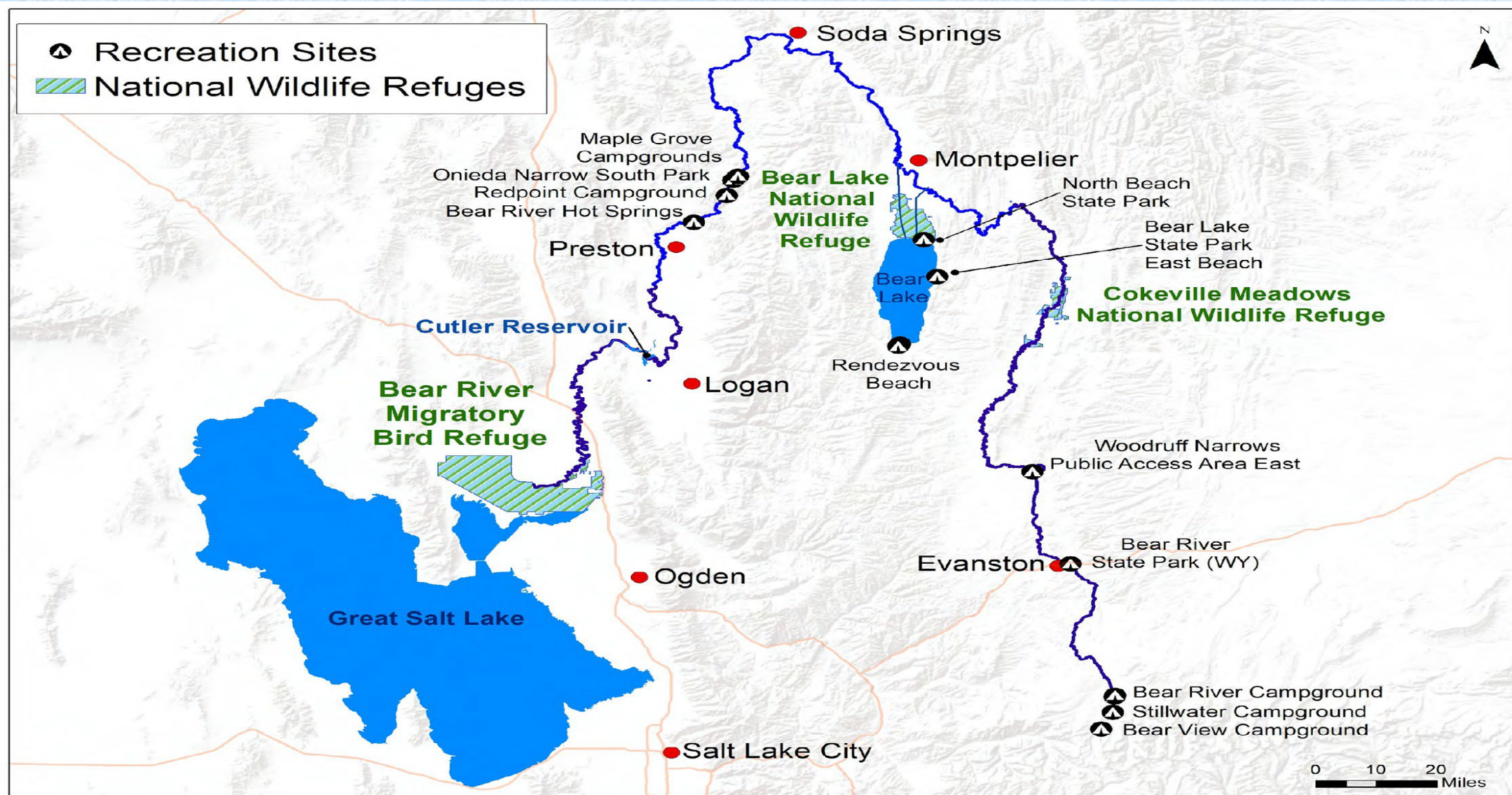


Table 13. Primary Bear River Recreation Sites

Site	State	Estimated Annual Visits	Primary Activities	Estimated Annual Regional Expenditures (\$2022)
Bear River Headwaters (Uinta- Cache-Wasatch NF)	Utah	230,000	hiking, camping, fishing, snowmobiling	\$7,181,071
Bear River State Park	Wyoming	130,590	biking, hiking, picnicking	Non-primary, local use
Woodruff Narrows Reservoir	Wyoming	5,640	fishing, boating, hunting	Local use
Cokeville Meadows National Wildlife Refuge (USFWS)	Wyoming	3,170	birding, fishing, hunting	\$81,610
Bear Lake National Wildlife Refuge (USFWS)	Idaho	12,000	birding, auto touring	\$308,934
Bear Lake	Idaho	1,115,000	beach lounging, boating, jet skiing	\$54,521,654
Site	State	Estimated Annual Visits	Primary Activities	Estimated Annual Regional Expenditures (\$2022)
Soda Dam/Alexander Reservoir (PacifiCorp)	Idaho	48,790*	boating, fishing, picnicking	Local use
Grace Dam/Black Canyon Gorge (PacifiCorp)	Idaho	21,495*	fishing, kayaking, picnicking	Local use
Oneida Narrows Reservoir and Canyon (PacifiCorp/BLM)	Idaho	79,130*	tubing, camping, fishing	\$2,037,173
Cutler Reservoir (PacifiCorp)	Utah	255,345*	bird hunting, boating, fishing	\$6,573,683
Bear River Migratory Bird Refuge (USFWS)	Utah	120,000	birding, photography, hunting, fishing	\$3,089,340
Total		2,021,160		\$73,793,465

*Aldrich, G and E, Hjerpe. 2022. The Conservation Funding Crisis. Conservation Economics Institute. 27p. https://www.conservationecon.org/_files/ugd/5fc209_964863909ec745818_cdb5a8643623366.pdf.

Each year over 2 million visits are made to established recreation sites along the Bear River.

Expenditures on food, lodging, gear, etc. by non-local recreationists total an estimated \$73.8 million a year.

Cultural and Heritage

Table 14: Annual Regional Bear River Heritage Area (BRHA) Visitor Expenditures (\$2022)

Note: Does not include Bear Lake visitor expenditures.

Spending Category	Percent Allocation	Visitor Expenditures
Lodging	21%	\$5,713,943
Gas/oil	37%	\$10,067,423
Restaurants	18%	\$4,897,665
Groceries	11%	\$2,993,018
Souvenirs/ miscellaneous	13%	\$3,537,203
Totals	100%	\$27,209,250

Environmental and non-market values

Non-market Value	Conservative
Recreation Consumer Surplus	
Waterfowl Hunting	1.0
Birding	2.0
Fishing	11.6
Boating	2.0
River Restoration	
WY/ID border to Dingle Marsh	23.8
Benson, UT to Cutler Dam	4.8
Wetlands	3.7
Total	48.9

Great Salt Lake values attributed to the Bear River

In addition to the economic impacts and contributions discussed above that stem from the use of Bear River water, the full economic value of the Bear River must also account for the industries and people that rely on the Great Salt Lake, to which the Bear River contributes 39% of inflows. (This value changes every year with the varied inflows of the Bear River. The %39 was based off of the 2022 Great Salt Lake Strike team report.)

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).

Employment

In total, the Bear River is responsible for over 11,400 regional full and part-time jobs, 8420 of these are tied to activities along the river, agriculture, recreation, power generation, etc. and the remaining 2980 are tied to Great Salt Lake mineral industry and brine shrimp harvesting. These jobs result in \$403 million in regional labor income

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

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