

Bear River Basin: Bear Lake Watershed**Watershed Description**

The Bear Lake Watershed in the Bear River Basin has an area of 3,280 km² and includes all lands draining to the Bear River between Stewart Dam, below the Idaho-Utah border, and Alexander Dam, near the town of Soda Springs, Idaho. The highest point in the watershed is Meade Peak (3,080 meters). The lowest elevation is below Alexander Reservoir (1730 meters). Bear Lake is the centerpiece of this watershed.



Bear Lake-Nancy Mesner, USU

During the hundreds of thousands of years of Bear Lake's existence, the Bear River has, on multiple occasions, connected to the lake during high water periods. However, in the last 11,000 years, the river has not been naturally connected to Bear Lake.

In 1911, a canal was constructed that now diverts almost all the water in the Bear River at Stewart Dam southward to Mud Lake. From there, when spring runoff water is being stored, the water flows through Mud Lake to enter Bear Lake. The rest of the year it flows through Mud Lake and out the Outlet Canal to rejoin the original Bear River channel. The upper 6.5 meters of Bear Lake function as a reservoir. The Lifton Pumping Station releases water from Bear Lake to the Bear River during the summer for irrigation.

Historically, the Bear River was a tributary of the Snake River. About 35,000 years ago, a volcanic debris slide cut off its original, northerly route and deflected the river to the south. The result of these events is the river's current, near-circular, route to the Great Salt Lake.

Tributaries and Reservoirs

Five large and sixteen small tributaries feed the Bear River in the Bear Lake Watershed, including:

- Montpelier Creek
- Liberty Creek
- Georgetown Creek
- Stauffer Creek
- Eight Mile Creek
- Soda Creek

These tributaries contribute to the Bear River directly. St. Charles Creek, Paris Creek, Fish Haven Creek, Swan Creek and Big Creek drain directly into Bear Lake or Mud Lake. There are 14 lakes and reservoirs in this watershed. (See Water Quantity section below.)

Climate

Annual precipitation ranges from 28 to 140 centimeters per year, depending on elevation. Most of the precipitation falls as snow at higher elevations. Average summer temperatures are between 21 and 32°C. Winter temperatures range from below -18 to -9°C.

Land Management and Uses

Almost half the watershed is privately owned. The U.S. Forest Service manages about one-third of the public land. Approximately half of the land is used as rangeland. Managed forests and agricultural lands account for most of the remaining land uses.

Water Quantity

The Bear Lake Watershed stores the most water of any watershed in the entire Bear River Basin. At its high water mark, Bear Lake holds about 1.75 billion cubic meters of water. Alexander Reservoir, lower in the watershed, provides 18.5 million cubic meters of storage.

Flow in the Bear River averages 540 cubic feet average 15 cubic meters per second as it enters this watershed. At Stewart Dam most of this flow is diverted south into a canal. The original channel of the Bear River is essentially dewatered below Stewart Dam, with an average flow of 0.5 cubic meters per second. The diverted water is directed to Bear Lake for storage. Water returns to the river below the Bear Lake outlet, where flows near Alexander, Idaho average 22 cubic meters per second due to inputs from Bear Lake and various tributaries. Flows are monitored at two sites in this watershed. An active USGS gauging station below the Bear Lake outlet near Pescadero and an active Pacificorp gage above Alexander Reservoir provide current streamflow information.



Alexander Reservoir-Untraveled Road (www.UntraveledRoad.com)

Water is used for irrigation, hydroelectric power, municipal, stock and industrial needs. Bear Lake County has 47 irrigation companies, which provide water to 75,680 acres. 300 km². Water released from Bear Lake is controlled by agreements outlined in the Kimball Decree, and the Dietrich Decree, and by the Bear Lake Settlement Agreement. The water levels in the lake fluctuate annually with these releases. Due to an extended drought, Bear Lake reached its lowest level in 70 years in 2004. It was nearly 5.5 meters below its normal elevation of 1800 meters.

Water Quality

The quality of surface water throughout the entire Bear River Basin varies with human activities and natural processes. Water quality issues in this watershed include:

- High levels of suspended sediments
- Phosphorus

In 2005, the Idaho Department of Environmental Quality completed a plan for managing both phosphorus and sediment in this reach of the river.



Bear River near Georgetown, Idaho-Dick Toth, USU

Bear River: There has been ongoing concern about the effect of Bear River water on Bear Lake, which is valued for its bright blue waters. Water diverted at Stewart dam travels through a complex of wetlands in Mud Lake. The wetlands filter out up to 70% of the sediment and phosphorus before the water enters Bear Lake. As water returns from Bear Lake to Bear River, however, Mud Lake serves as a source of both sediment and phosphorus. Below Bear Lake there are a number of nonpoint sources of phosphorus including livestock grazing, other agricultural activities, and urban activities. Several tributaries also contribute excess sediment and phosphorus. Despite these inputs, the actual concentrations of sediment and phosphorus decrease in the river as it approaches Alexander Reservoir. Nutrient levels increase in the reservoir due to discharges from Soda Springs Wastewater Treatment Plant and the Clear Springs Foods Fish Hatchery, but excess sediment is considered to be the primary pollutant of concern for Alexander Reservoir.

Tributaries: Tributaries below Bear Lake in this watershed contribute 5-25% of the total phosphorus and sediment increase in the river as it travels from Bear Lake to Alexander Reservoir. Sources of pollutants include:

- Runoff from agriculture and grazing lands
- In-stream erosion
- Streambank erosion

Improvement Projects: Recent projects to help improve water quality in this watershed include:

- Installing best management practices on animal feedlot operations south of Montpelier.
- Implementing stream restoration and water quality improvement projects on St. Charles Creek to improve spawning habitat for the Bonneville Cutthroat Trout.
- Plans to reduce pollutant loading in other impaired streams identified by the Idaho DEQ are being developed.

Bear Lake: Bear Lake's water takes on a milky blue color because of the tiny particles of calcium carbonate suspended in the lake. High nutrient concentrations often lead to an overabundance of microscopic algae in lakes. As the algae decompose, transparency and oxygen concentrations are reduced and lake fisheries are impacted. Excess phosphorus in Bear Lake, however, adheres to the calcium carbonate and therefore cannot be used by microscopic algae, leaving the lake with very low concentrations of algae. Lake managers monitor the lake closely to assure that increased

sources of nutrients do not lead to impaired waters in the lake. Communities on the south, southeast, and west shorelines, including St. Charles and Fish Haven, have installed sewer systems to protect the lake from septic tank inputs. A feasibility study will be conducted to determine if a sewer system would be cost-effective for the remaining communities on the east side of the lake. If it's deemed feasible, construction of the sewer could start as early as 2008.

Vegetation and Wildlife

Shrubland covers over one-third of the area in this watershed. Open water and evergreen forests combined, account for about one-fifth of the area. There are 137.3 km² of wetlands, giving this watershed more wetlands than any of the Bear River's other watersheds. Most of the wetlands are located around Mud Lake and Bear Lake. As with other watersheds in the Bear River Basin, the Bear Lake Watershed's diverse land types provide different habitats for aquatic, riparian, and terrestrial wildlife.

The Bear Lake National Wildlife Refuge, at the north end of Bear Lake, has 77 km² of marsh, open water, and grassland habitat, making it the largest wetland in the region. The refuge supports a White-Faced Ibis nesting colony of 5,000 birds, one of the largest in the west. It also provides important nesting, feeding, and resting areas for Canada geese, Greater Sandhill Cranes, and a variety of ducks and other shorebirds.

The Georgetown Summit and Montpelier Wildlife Management Areas provide a migratory pathway for many shorebirds, wading birds, and waterfowl heading south to Bear Lake and Great Salt Lake.

Bear Lake itself is home to four species of fish that are found nowhere else in the world:

- Bonneville Cisco
- Bonneville Whitefish
- Bear Lake Whitefish
- Bear Lake Sculpin

Bear Lake also supports a strain of the Bonneville Cutthroat Trout that evolved in Bear Lake. Streams draining into the lake are closed to fishing during May and June to allow the Cutthroat to spawn naturally or to be trapped by Utah Division of Wildlife Resources for propagation of their eggs in a fish hatchery. All Cutthroat Trout eggs taken from fish traps on Bear Lake tributaries are returned to the lake as fingerlings the following spring.

People

This watershed encompasses parts of Bear Lake and Caribou counties in Idaho, and Rich County



Elk in the Georgetown Summit Wildlife Management Area-Idaho Fish and Game



Development near Fish Haven on Bear Lake-Kevin Kilpatrick, USU

Metric Units

Revision 7/11/07

in Utah. It includes the towns of Montpelier and Soda Springs in Idaho and Garden City in Utah. The population in this watershed is about 10,500. The largest employment sectors include agriculture, government, retail, and tourism. Future economic growth in this watershed is expected to occur in agriculture, energy, tourism, and manufacturing.

Population in the entire Bear River Basin, in and around existing municipalities, is expected to increase significantly by 2050. Development within and near Garden City, Utah is moving outward from the lakeshore and up the sides of the foothills. Second homes and summer cabins account for most of the growth.

Recreation

Bear Lake State Park, Mud Lake, and other locations around Bear Lake provide wonderful recreational opportunities. Fishing for Lake Trout, which have been stocked in Bear Lake since the 1930's as a sport fish, is a popular activity—as well as fishing for the Bonneville Cisco and Bonneville Cutthroat Trout. Other popular activities at Bear Lake include camping, boating, water skiing, and swimming during the summer and ice fishing and snowmobiling during the winter.

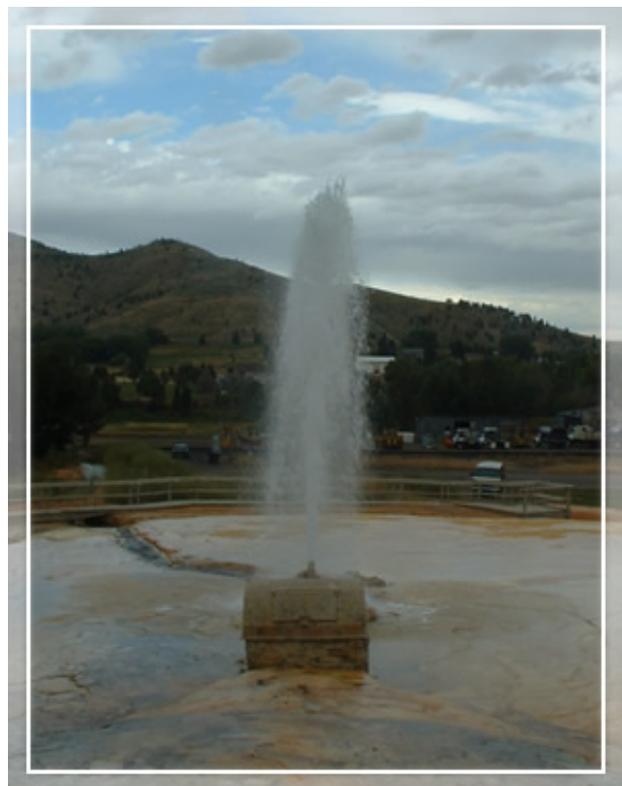
The Georgetown Summit and Montpelier Wildlife Management Areas, managed by the Idaho Department of Fish and Game, provide good opportunities for hiking, backpacking, horseback riding, hunting and wildlife viewing. The Bear Lake National Wildlife Refuge offers additional wildlife viewing and canoeing opportunities.

Many opportunities for camping, hiking and exploring off-road vehicle trails can be found in the Caribou National Forest in Idaho.

Other Points of Interest

Bear Lake: Bear Lake is a deep natural lake. The lake appears turquoise due to the suspended marl (calcium carbonate particles) in the water. The lake is best known for its intense turquoise color on sunny days. The lake is about 32 kilometers long and 11 kilometers wide. The lake has a maximum depth of 60 meters. Depths increase from west to east due to faulting along the eastern edge of the lake. Water levels vary with releases of storage water in the top portion of the lake.

Historical sites: Several buildings in this watershed record the region's history and are listed on the National Register of Historic Places. These include the Bear Lake County Courthouse and the Paris Tabernacle in Paris, "Old Town" in Montpelier and the Soda Springs City Hall in Soda Springs in Idaho.



Geyser in Soda Springs, Idaho-Clark Bryner

Hooper Spring: Hooper Spring provides clear sparkling soda water in a beautiful city park located two miles north from the center of Soda Springs. Soda water from these springs was nationally renowned after rail service reached this resort area in 1882.

Formation Springs and Cave: This Nature Conservancy Preserve, located a few miles outside of Soda Springs, was established to protect the crystal-clear pools and a unique wetland complex at the base of the scenic Aspen Mountains. The cold springs that feed the terraced pools and creek system deposit high concentrations of travertine (calcium carbonate), which gives the site its unique geology.

Oregon Trail Park & Marina: The Oregon Trail, marked by white carsonite markers, heads up from Alexander Reservoir and crosses the road that leads down into the park. This is a good picnic spot.

Minnetonka Cave: This cave is the largest commercially developed limestone cave in the state of Idaho and has rooms of gleaming stalactite and stalagmite formations which open one after the other over a little less than a kilometer. The cave is located 16 kilometers up scenic St. Charles Canyon west of Bear Lake.

Bear Lake Raspberry Festival: The Bear Lake Raspberry Days Festival occurs in early August. It includes a craft fair, Berry Princess Contest, Saturday Parade, concerts, talent show, and rodeo at the Laketown Arena and the Raspberry Days scramble at Bear Lake West Golf Course. It is a great time to taste the wonderful raspberry shakes that have made Bear Lake famous.

Additional Information on this watershed:

Bear Lake Watch (<http://www.bearlakewatch.com/>)

Bear Lake Conservation and Visitor's Bureau. (<http://www.bearlake.org/histcontents.html>)

Bear River Heritage Area (<http://www.bearriverheritage.com/>)

Bear River Watershed Council Conservation Corridor (<http://www.brwcouncil.org>)

Community Profiles (<http://www.hometownlocator.com>)

Idaho Fish and Game Wildlife Management Areas
(<http://fishandgame.idaho.gov/cms/wildlife/wma>)

PacifiCorp Hydro Power Generation and links
(<http://www.pacificorp.com/Navigation/Navigation1842>)

Public Lands Information Center Idaho Public Land Sites
(<http://www.publiclands.org/explore/index.php?picstate=ID>)

United States Census 2005 Demographic Profiles (<http://censtats.census.gov/usa/usa.shtml>)

United States Fish and Wildlife Service Bear Lake National Wildlife Refuge

(http://pacific.fws.gov/refuges/field/ID_Bearlk.htm)

United States Geological Survey Western Lake Catchment System

(<http://climchange.cr.usgs.gov/info/lacs/index.html>)

Utah Division of Wildlife Resources Fishing Bear Lake

(<http://www.wildlife.utah.gov/fishing/bearlake.html>)

Utah Division of Water Rights History of the Bear River Compact

(<http://waterrights.utah.gov/techinfo/bearrivc/history.html>)

USU Water Quality Extension. 2006. Journey through the Bear River Watershed: Project WET International Foundation. Retrieved from:

<http://extension.usu.edu/waterquality/files/uploads/Part%201%20%20and%20Part%202%20Final.pdf>

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