Bear River Basin: Middle Bear Watershed

Watershed Description


Alexander Dam, Idaho-Jay Baker, USU

The Middle Bear Watershed includes all land that drains to the Bear River from below Alexander Dam in Idaho to Cutler Dam in Utah. It is the second largest watershed in the Bear River Basin, draining 3,230 km^2. After the river leaves Alexander Reservoir, it makes a hairpin turn around Sheep Rock and heads south. At Grace Dam water is diverted into an aqueduct and delivered to the Grace Power Plant at Cove Dam. The river continues through the wide, relatively flat Gem and Gentile Valleys in Idaho, passes through Oneida Reservoir, and continues south through Cache Valley in Idaho and Utah. The river flows through Cutler Reservoir and enters a narrow canyon. On its 180 kilometer journey through this watershed, the river loses about 410 meters in elevation. The highest point in the watershed is Mt. Naomi (3040 meters) in the Naomi Peak Wilderness Area. The lowest point is below Cutler Dam (1320 meters).

Tributaries and Reservoirs


Bear River in Gentile Valley, Idaho-Unknown

The Cub River is the largest tributary of the Bear River in this reach. It drains 575 km^2.Other tributaries include:

- Cottonwood Creek
- Weston Creek
- Newton Creek
- Summit Creek
- Birch Creek

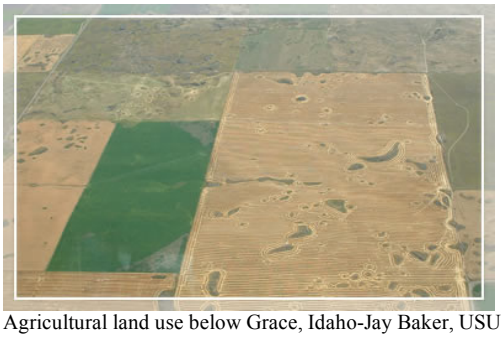
There are 15 lakes and watersheds scattered throughout the Middle Bear Watershed. Oneida Narrows Reservoir, located on the mainstem of the Bear River in Idaho, stores the most water. Other reservoirs include Twin Lakes, Foster, Glendale, Lamont, Strong Arm, Treasureton and Newton Reservoirs. These reservoirs are used to store water for irrigation and recreation. Hydropower is generated at dams near Oneida and Grace Idaho. Cove Dam was used to generate power, but with repairs needed, was decommissioned in 2006. During high flows, power is generated at Cutler Dam.

Climate

Precipitation ranges from 28 to 145 centimeters per year in this watershed, with an average of 56 centimeters per year. Most of the precipitation falls as snow in the higher elevations. Summer temperatures are between 27 to 32°C. Winter temperatures range from -18 to -9°C.

Land Management and Uses

Over two-thirds of the land in this watershed is privately owned. The US Forest Service manages most of the remaining public land. Over three-quarters of the land is used for grazing and agriculture.


Agricultural land use below Grace, Idaho-Jay Baker, USU

Water Quantity

Average daily flows in the Bear River increase from 22 cubic meters per second below Alexander Reservoir to 31 cubic meters per second at the Idaho-Utah border. As the Bear River enters Cutler Reservoir, flow rates average 31 cubic meters per second. Flows vary throughout the watershed due to the numerous diversions and annual and seasonal variations. For example, flow rates below Alexander Reservoir have ranged from 0.7 cubic meters per second in 2004 to a high of 124 cubic meters per second in 1983. Flow in the Bear River has been measured at various sites in the watershed since 1857. Currently, the only active gauging stations are near the Idaho-Utah state line and below Grace and Oneida Dams. These stations provide current streamflow data.


Oneida Reservoir, Idaho-Nancy Mesner, USU

Surface water from the mainstem and its tributaries is distributed through a series of diversions. The largest diversion is the Last Chance Canal, located below Alexander Reservoir. It diverts 74 million cubic meters of water per year. Near Grace, Idaho, water is completely diverted from the Bear River and routed to the Grace Power Plant. Due to this diversion, most of the water in Black Canyon, below Grace, comes from natural springs and local drainage.

Water Quality

As in the rest of the basin, water quality issues in the Middle Bear Watershed are primarily from excess sediment and high levels of phosphorus.

Bear River: According to the Idaho Department of Environmental Quality (DEQ), the reach of the Bear River between Alexander Reservoir and the Idaho-Utah border is impacted by low flows and excessive sediment and nutrients. Between Alexander and Oneida Reservoirs, phosphorus and sediment loads increase substantially. Although the Bear River carries excess phosphorus and sediment into Oneida Narrows Reservoir, the reservoir itself is not impaired.


Diversion above Grace Power Plant, Idaho-Nancy Mesner, USU

Suspended sediment drops out in Oneida Reservoir, resulting in improved water quality below the reservoir. The river picks up sediment and phosphorus again as it flows to the state line. Once in Utah, sediment and nutrient concentrations continue to increase. Low levels of dissolved oxygen and high levels of phosphorus are water quality concerns at Cutler Reservoir. To address these issues, the Utah Division of Water Quality has revised the existing watershed plan for the Bear River from the Idaho/Utah state line to Cutler Dam. This Total Maximum Daily Load (TMDL) plan was completed in 2006.


Exposed banks on the Cub River-Nancy Mesner, USU

Tributaries: Many of the tributaries in this watershed are impacted by sediment and phosphorus. Battle Creek and Deep Creek supply excess loads of phosphorus and sediments. Fivemile Creek and Weston Creek contribute excess phosphorus directly to the Bear River. These four tributaries contribute up to 75% of the phosphorus loads entering the Bear River between Oneida Reservoir and the Idaho-Utah state line. Most of the phosphorus loading occurs during runoff season.

The Cub River, the largest tributary in the watershed, has good water quality at its headwaters, but the lower portion of the river is impacted by sediment and excess nutrients. Most of the pollutants come from impacted tributaries.

Non-Point Sources of Pollutants

Most pollutant sources in this watershed are "non-point." This includes runoff from the land or erosion along the streams.

The primary sources of sediments are:

- In-stream channel erosion
- Natural erosion of streambanks
- Changes in in-stream flows

- Grazing on streambanks
- Overgrazed or damaged riparian areas that fail to capture sediment runoff before it enters the river

Additional sources of sediments and nutrients include:

- Fertilizers
- Animal waste
- Urban runoff
- Channelization
- Impacts to the streambanks associated with water releases for power production (i.e. ramping).

Point Sources of Pollutants

There are several point sources of pollution in this watershed:

- The Franklin Waste Water Treatment Plant
- Preston Waste Water Treatment Plant discharges into a tributary of the Cub River
- Richmond Lagoons discharge to the Cub River
- Grace Waste Water Treatment Plant enters the Bear River directly.

Improvement Projects

Various water quality improvement projects have been completed in this reach of the Bear River, including:

- Improving riparian habitat to reduce bank erosion
- Reducing runoff from animal feeding operations.
- Relicensing for power generation at Alexander, Grace, Oneida and Cutler dams. The new licenses require a change in the pattern of water releases from the dams and improved management of lands around Cutler Reservoir. To protect the company from litigation due to flood damage, Pacificorp purchased some of the bottom lands north of Cutler Reservoir to the Utah-Idaho state line. The company is pursuing alternative approaches for managing this land to enhance habitat and improve water quality.

Confluence of Cub River with the Bear River, Utah-Unknown

Vegetation and Wildlife

About one-third of the land cover within the Middle Bear Watershed is shrubland and one-fifth is pastureland. There are smaller areas of cropland, grassland, and evergreen forests.

The Middle Bear Watershed has diverse land types that provide different habitats for aquatic, riparian, and terrestrial wildlife. The Caribou National Forest in Idaho and the Wasatch-Cache National Forest in Utah are part of a critical wildlife migration corridor. The wetlands around reservoirs (e.g. Twin Lakes, Oneida Narrows and Cutler) are another important habitat in this watershed.


Black Canyon, Idaho-Clark Bryner, USU

A thirty-nine kilometer reach of the Bear River below Cove Dam supports a small population of native Bonneville Cutthroat Trout. Now that Cove Dam is decommissioned, the dam will no longer act as a barrier for the fish and their migratory corridor will increase by six miles to include Black Canyon. The stretch of river below Oneida Reservoir contains good habitat for Bonneville Cutthroat Trout and supports a healthy population of Brown Trout.

People


Grace, Idaho-Clark Bryner, USU

This watershed includes portions of Caribou, Franklin and Bannock Counties in Idaho and Cache County in Utah. The largest municipalities are Grace and Preston in Idaho, and Richmond, Smithfield and North Logan in Utah. Other municipalities in Cache County fall within the watershed to the south, which drains the Logan, Blacksmith and Little Bear rivers. In total, the population in this watershed is over 30,000. Agriculture and government are currently the largest employment sectors. Agriculture and manufacturing sectors are expected to grow in the future.

Recreation

There are numerous recreational opportunities in the Middle Bear Watershed. Water-based recreation on the reservoirs includes boating, jet-skiing, fishing, and swimming. Camping is available near some of the reservoirs. The Oneida Narrows, a reach just below Oneida Reservoir, is a popular fishing, canoeing, and kayaking site.


Oneida Narrows, Idaho-Jake Gibson, USU

Black Canyon is a deep, narrow gorge that cuts through a basalt formation below the town of Grace, Idaho. It is a unique place to visit and fish for trout. Since the early 1900s, the water entering Black Canyon has been completely diverted to Grace Power Plant, making the river navigable only by canoe or kayak during extreme high flow years. Beginning in 2008, PacifiCorp will provide scheduled releases of whitewater flows into Black Canyon during the spring and early summer of each year.

The Caribou National Forest provides excellent opportunities for hiking, camping, fishing, horseback riding, biking, off-road vehicle use, and snowmobiling. Mt. Naomi Wilderness Area encompasses 180 km^2 in the high mountains on the east side of Cache Valley. Mount Naomi rises to 3,040 meters and offers breathtaking views of the surrounding peaks and Cache Valley. The alpine scenery of this wilderness is some of the most spectacular in the Rockies, with unique floral species and an abundance of wildlife, including moose, elk, deer, and beaver. In addition to hiking, popular activities along this trail include fishing, non-motorized boating, backpacking, horseback riding, camping, picnicking, and various non-motorized winter sports.

Other Points of Interest

Bear River Massacre Site: One of the worst massacres of Native Americans in the West occurred at this site. On January 29, 1863, soldiers from Fort Douglas, Utah attacked the winter camp of Chief Bear Hunter on Battle Creek and killed at least 250 men, women, and children. Several historical markers on Highway 91 outside of Preston note the event.

Sheep Rock: Sheep Rock is a stone bluff that rises a few hundred meters above the Bear River and marks the northern end of the Wasatch Mountain Range. Eight kilometers west of Soda Springs, the Bear River makes a sweeping left turn around the base of Sheep Rock and heads south towards the Great Salt Lake. As noted in numerous diaries from the period, Sheep Rock was a prominent landmark for emigrants on the Oregon Trail.

Grace Fish Hatchery: This fish hatchery was built in 1946 and supplies fish stock to southeast Idaho lakes, rivers, and streams. The hatchery has a shaded picnic area and access to fishing on Whiskey Creek, which is stocked throughout the fishing season with rainbow trout.

Last Chance Canal: The Last Chance Canal was completed in the early 1900s to divert water from the Bear River to the west side of the Bear River valley below Grace Dam. It was considered an engineering feat in its time. This canal is part of an extensive network of irrigation canals created by settlers of this region. Find pictures of the Last Chance Canal at: http://www.byways.org/browse/byways/2049/places/13372/photos.html.


Hot spring on the Bear River, near Riverdale-Jake Gibson, USU

Hot Springs: Hot spring water discharges into the Bear River at multiple locations in this watershed. Some of the most popular undeveloped sites are Battle Creek (also known as Wayland), Squaw Hot Springs, Cleveland, Maple Grove, Treasurton, and Mound Valley Hot Springs. Six miles north of Preston, Riverdale Resort has five different pools of natural spring water for soaking and swimming as well as other resort activities and accommodations.

Additional Information on this watershed:

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

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

Bridgerland Audubon Wetland Maze in Cutler Marsh
(www.bridgerlandaudonon.org/wetlandsmaze/index.html)

Cache Valley Tourism (www.tourcachevalley.com)

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

Cutler Marsh (http://www.utahbirds.org)

Grace Chamber of Commerce Welcome to Grace and Gem Valley (http://www.graceidaho.com)

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

Idaho State University Digital Atlas of Idaho (http://imnh.isu.edu/digitalatlas)

Maple Grove Hot Springs (http://www.maplegrovehotsprings.com)

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?plicstate=ID)

Public Lands Information Center Utah Public Land Sites
(http://www.publiclands.org/explore/index.php?plicstate=UT)

United States Census 2000 Demographic Profiles (http://censtats.census.gov/usa/usa.shtml)

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http://jobs.utah.gov/wi/Regions/northern/cache/cachefs.pdf.

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Utah Division of Water Quality. 2000. Newton Reservoir. Retrieved from:
http://www.waterquality.utah.gov/watersheds/lakes/NEWTON.pdf

Utah Power and Light in the Gem Valley and Grace
(http://www.graceidaho.com/html/utahpower.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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