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UTAH'S WATER QUALITY

Water Quality Inventory **Fall 2000**

Utah monitors and assesses its surface waters, rivers and streams, and lakes and reservoirs on a regular basis to determine whether they are supporting their beneficial uses. Among other things, these assessments identify impacts from pollution sources so efforts can be taken to protect and improve water quality. A report on the quality of Utah's waters is also required to be provided to Congress every two years. This fact sheet contains a summary of information in the 2000 Water Quality Assessment Report to Congress.

Year 2000 305(b) Assessment

Pollution standards are established to protect the beneficial uses of the streams, rivers, lakes and reservoirs within the state. Beneficial uses include source of drinking water (Class 1C), and recreation (Classes 2A and 2B). Fishing and other aquatic life classifications include cold water game fish (3A), warm water game fish (3B), non-game fish (3C) and other aquatic life such as waterfowl and shore birds (3D). Waters used for irrigation and stock watering are classified as Class 4. Streams and lakes of the state are classified as one of the above or a combination of them. The quality of water is assessed as "fully supporting" (good to excellent water quality), "partially supporting" (meets the standards most of the time), and "not supporting" (frequently the water quality standards are not met).

In assessing the quality of state waters, scientists look at general water chemistry and for the presence of nutrients and toxics. Data are compared against state standards and pollution indicators. Stream structure and stream bank habitat may be used to assess beneficial use support. Since a waterbody may have multiple uses, all criteria for each use must be met to be fully supporting. For the most part, the Class 2A and 2B categories were not assessed due to the difficulty in meeting quality control requirements for bacteriological samples.

Utah's recently completed assessments in the Bear River, West Colorado, Southeast Colorado, and Weber Watershed Management Units were combined with previous intensive assessments for the Uinta, Cedar/Beaver, Jordan, and Lower Colorado (Virgin) Units to determine what river and stream segments in the State were supporting their beneficial uses. Nonpoint source pollution still remains the major source of pollution in the state. Nonpoint source pollution originates from runoff from various land uses such as urban areas , agriculture, and erosion from land disturbances such as road construction, mining, and oil and gas exploration and production. Point source pollution impacted about 3% of the stream miles. Point source pollution is discharged from a pipe, usually from a municipality or industry.

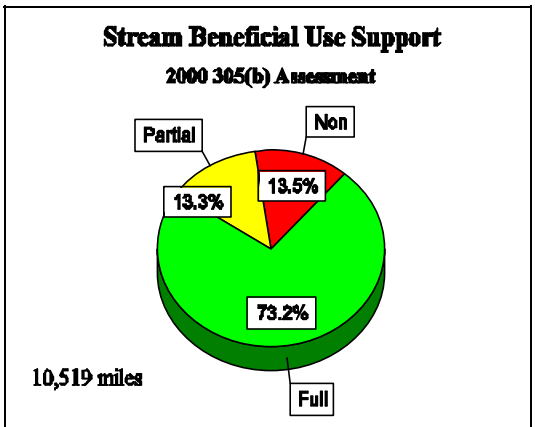

Figure 1. Overall Beneficial Use support.

RIVERS AND STREAMS

In the past, EPA has estimated that there were 16,457 perennial stream miles in the state. However, a more recent estimate completed by the state indicates that there are about 14,280 perennial stream miles within Utah. Based on the new estimate of stream miles, 73.7% (10,519 miles) were assessed to determine if they were supporting their beneficial uses. About 73% were assessed as fully supporting all of the beneficial uses, 13.3% were found partially supporting and

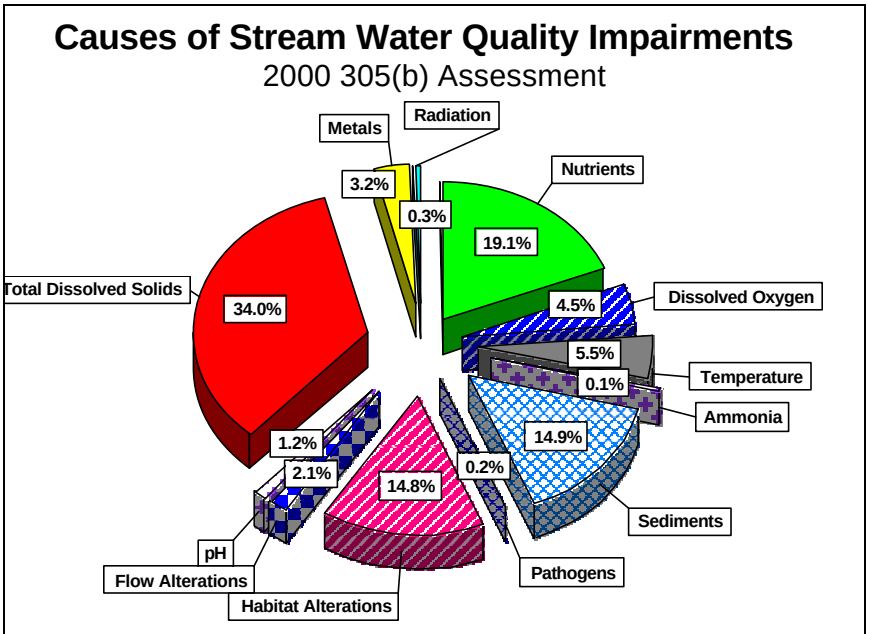

Figure 2. Relative percent impact by causes on stream water quality.

13.5% were found not supporting at least one beneficial use. The relative impact of various causes and sources for the 2,819 miles of streams that were assessed as either partially or not supporting at least one of their beneficial uses are shown in Figures 2 and 3. The four leading causes of impairment were total dissolved solids (salts), nutrients, sediments, and habitat alterations. Excessive nutrients can cause algal blooms that remove oxygen from the water. They can also cause taste and odor problems in drinking water. High levels of salts can make water unsuitable for drinking water or irrigation. Sediment fills in streams reducing fish spawning areas, plugs filters, and fills irrigation ditches. Habitat alterations can reduce fish habitat and increase runoff into streams.

Agricultural practices, such as grazing, improper manure management and irrigation, caused increased nutrient and sediment loading into streams. Other significant sources of pollution included natural sources and hydrological modifications such as stream channel alterations. Point sources added nutrients to streams in several areas of the state and the loss of riparian (stream bank) habitat impacted the fisheries on many streams.

Figure 6 identifies the overall beneficial use assessment of streams in the state. In addition, it identifies those impaired stream segments for which a Total Maximum Daily Load has been determined by the State and approved by the Environmental Protection Agency. Some areas of concern in the state include the following:

Bear River Basin: Bear River and some tributaries in Cache and Box Elder Counties- nutrients, sediments;

Weber River Basin: Silver Creek - metals, East Canyon Creek - nutrients, dissolved oxygen;

Colorado River Basin: Onion Creek - total dissolved solids and temperature, Fremont River - total dissolved solids;

Lower Colorado River Basin: Santa Clara River and portions of the Virgin River - total dissolved solids;

Utah Lake-Jordan River Basin: Little Cottonwood Creek - metals; Diamond Fork - habitat modification;

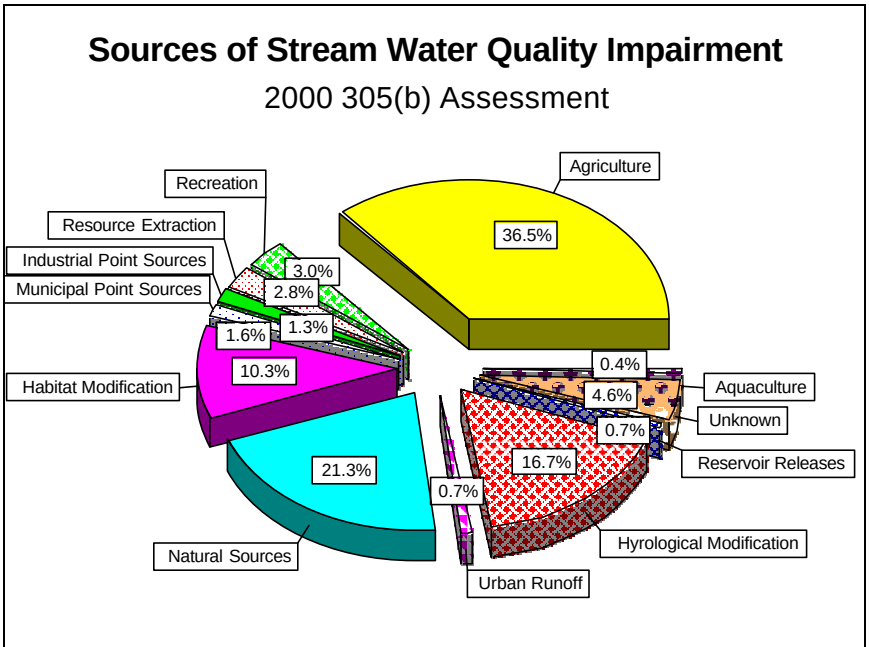

Figure 3. Relative percent impact by sources on stream water quality.

Green River Basin: Salinity in general

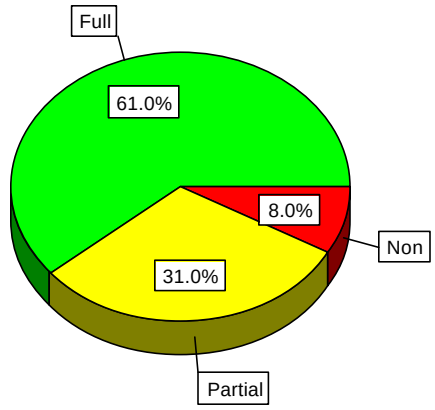

Figure 4. Lake/Reservoir beneficial use assessment.

throughout the basin; Ashley Creek - selenium.

LAKES AND RESERVOIRS

There are over 3,000 lakes and reservoirs in the state. Of these, 130 key lakes and reservoirs are monitored on regular basis to assess beneficial use support. One-hundred thirty-one (131) lakes were assessed during this cycle. Of these 80 (61%) were fully supporting, 41 (31%) were partially supporting, and 10 (8%) were not supporting their beneficial uses (Figure 4). Based upon lake acreage assessed (460,642), 70% was found fully supporting the designated uses assessed; while 29% was assessed as partially supporting and 1% not supporting at least one beneficial use. Lakes and reservoirs were found not supporting their beneficial uses because they act as traps for pollutants and concentrate them. This leads to problems in late summer especially in reservoirs when the water is drawn down reducing the amount of water that is available as suitable habitat for fish. Higher temperatures and less water also create better conditions for algal blooms (aquatic plants) that can reduce oxygen levels, cause taste and odor problems, and create that green "scum" one sees on the surface of some lakes and reservoirs.

The causes of impairment in lakes and reservoirs continue to be nutrients, siltation, low dissolved oxygen, suspended solids, organic enrichment, and noxious aquatic plants. The major sources causing impairments were agricultural practices, hydrological modification (drawdown), and municipal and industrial point source discharges.

Table 1 lists a few of the areas of concern within the state. A more detailed list of the causes of lake and reservoir impairment can be found in the 303(d) list of impaired waters on the Division's web site. Figure 7 shows the impaired lakes and reservoirs and Table 2 lists the identification number and lake name.

Table 1. Some Lakes and Reservoirs of Concern

Lake/Reservoir	Parameters of Concern
East Canyon Reservoir	nutrients and dissolved oxygen
Otter Creek Reservoir	nutrients and temperature
Minersville Reservoir	nutrients and dissolved oxygen
Scofield Reservoir	nutrients and dissolved oxygen

GROUND WATER

For this reporting cycle, Utah selected to report on the Cedar/Beaver Basin watershed for its 2000 305(b) ground water assessment report. One of the significant issues affecting this area has been increased corporate hog farming operations locating in the area. Since 1995, there have been eleven new facilities constructed. The potential impact to groundwater from these facilities has made this a priority watershed.

The Cedar/Beaver Basin is made up of six groundwater reservoirs. These are the upper Beaver River, Milford area, lower Beaver River, Parowan Valley, Cedar Valley, and the Beryl-Enterprise area. The lower Beaver River groundwater basin, which includes the area below Black Rock and Sulphurdale, is not discussed in detail as there are no data available. These groundwater reservoirs are discussed in greater detail in the 305(b) report. They are used to supply water for municipal and industrial, agricultural and irrigation, stock and other minor miscellaneous uses. Groundwater reservoirs function in a way similar to surface water storage reservoirs where the volume of water in storage is determined by the recharge and discharge. When groundwater levels decline, well water levels drop and seep and spring discharges on the valley floors may be reduced. The opposite is also true when groundwater levels raise. If the groundwater discharge exceeds the recharge over several decades, then mining occurs. This has occurred in some areas of the basin.

Man-caused pollution along with natural causes has effected the water quality in the Cedar/Beaver Basin. This has resulted in increased concentrations of nitrates and total dissolved solids in localized areas. The State ground water quality program uses the total dissolved solids (TDS) concentrations to distinguish the difference in water quality and

beneficial use. The lower the TDS concentrations, the greater the beneficial use is considered to be for that water. In addition, recent and future growth and development will create changes in water use and will further impact the water quality. Due to the increased development of corporate animals farms and a large number of wells, the area known as Milford Flats is currently under investigation.

WHERE WE ARE HEADED

The Division of Water Quality recently created a section to work on TMDLs. This section will be responsible for completing the current TMDLs that are on the State's 303(d) list of waters and to act as watershed coordinators within each of the watershed management units (Figure 5). In addition, several new individuals have been hired to work in the Water Quality Section to work in the 319 Nonpoint Source Management Program and water quality assessment. For assistance on the various programs in these sections, you can contact the individuals listed.

For a more detailed assessment of waters of the State, the Division has created fact sheets and reports for the Bear River, Weber River, West Colorado, and Southeast Colorado Watershed Management Units. Copies of these are available and can be obtained by calling Tom Toole at 801-538-6859 or sending an e-mail to ttoole@deq.state.ut.us. They can also be found at the Division's website at www.deq.state.ut.us/eqwq/dwq_home.ssi.

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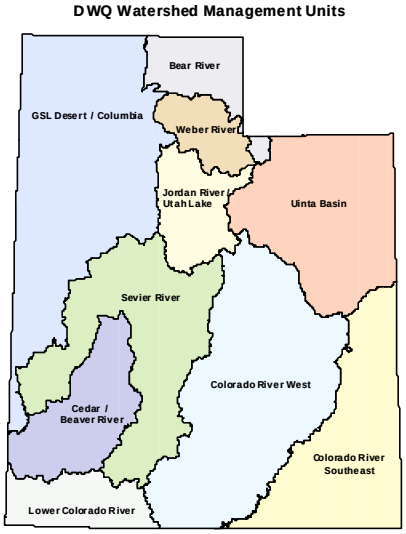

Figure 5. Watershed management units.

Utah's Stream Beneficial Use Assessment

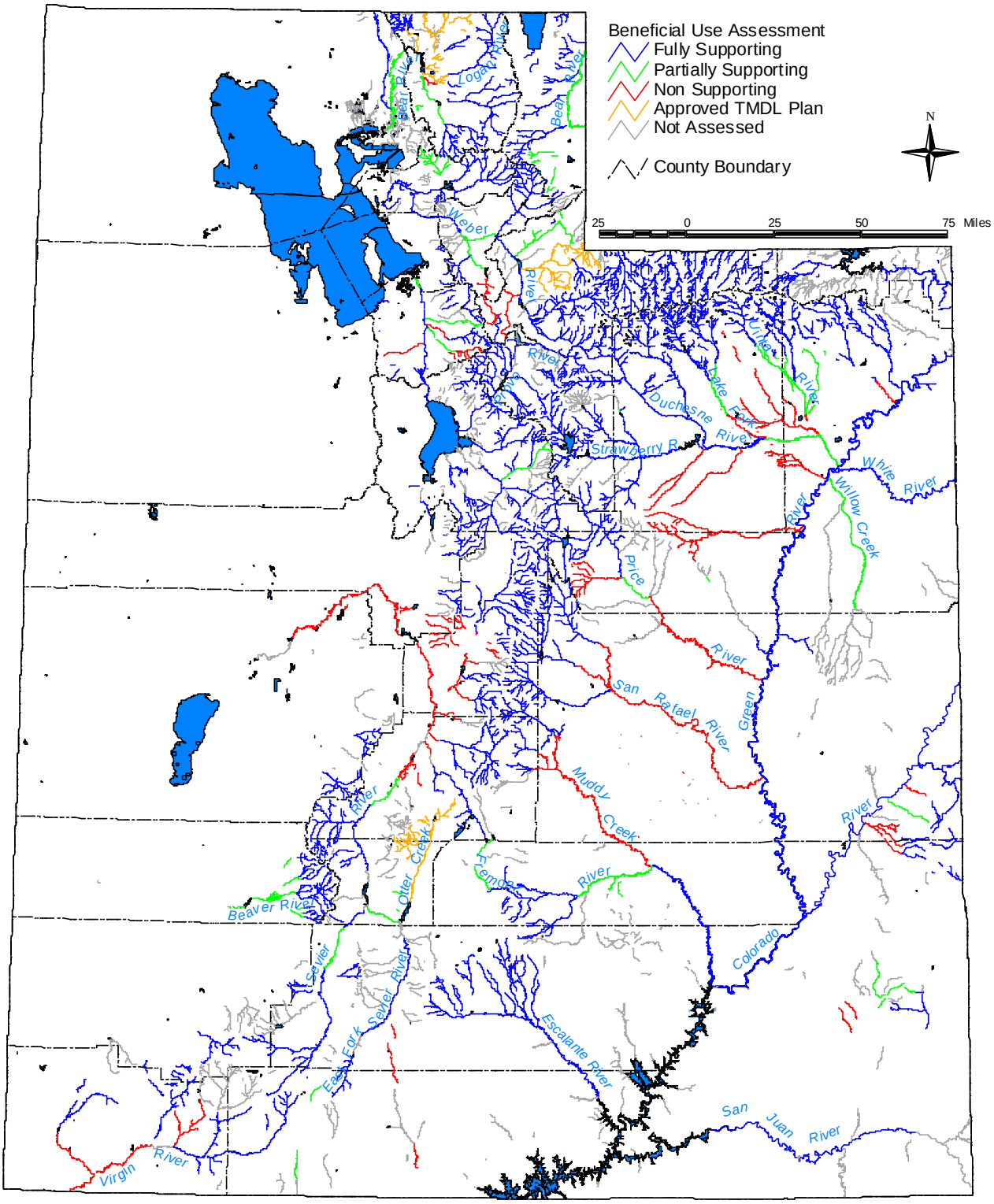

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Figure 7. Overall stream beneficial use support.

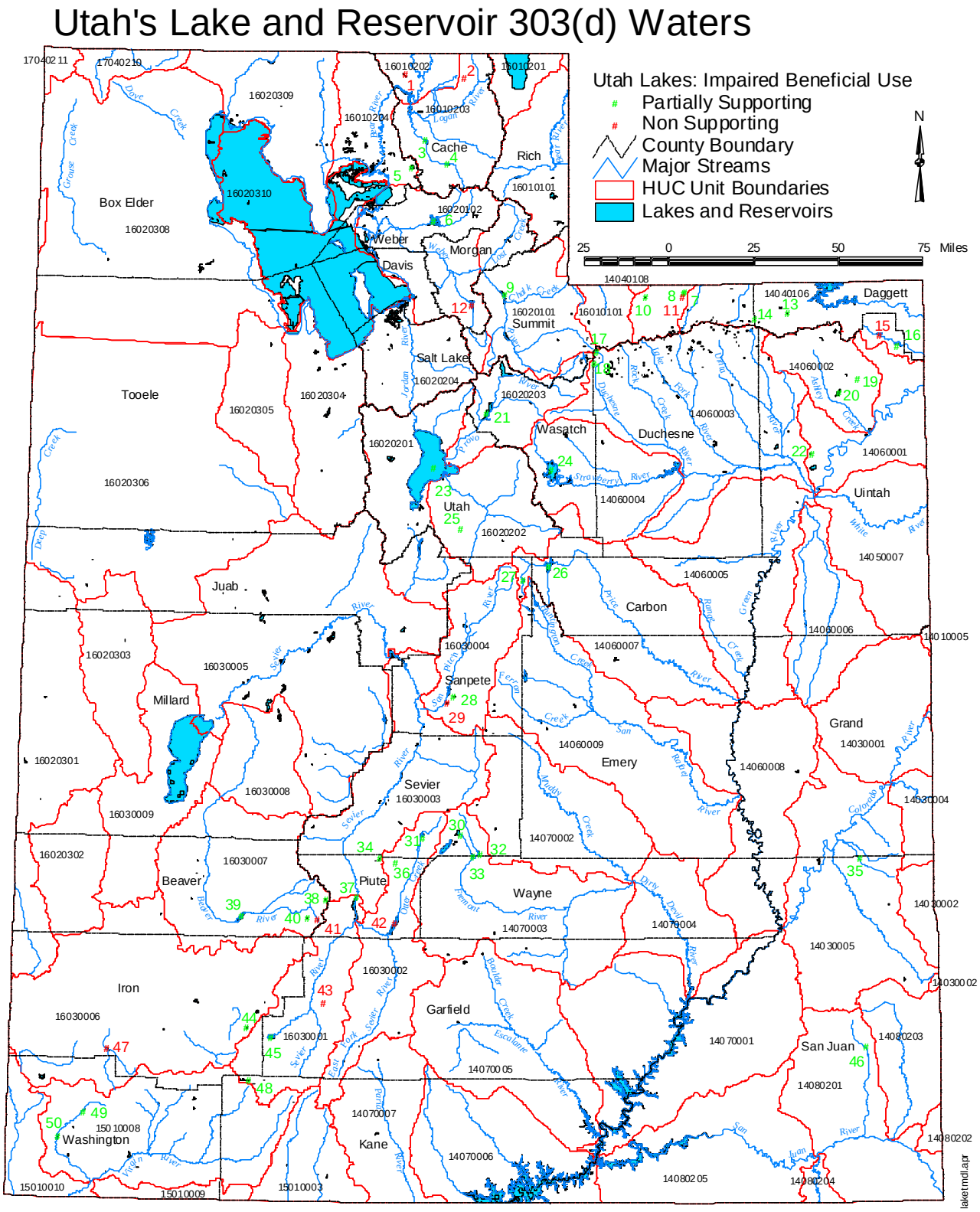

Figure 8. Impaired lakes and reservoirs.

Table 2. Lake/ Reservoir Number and Name for Map of Lake/Reservoir 303(d) Waters			
Lake Number	**Lake Name**	**Lake Number**	**Lake Name**
1	Newton Reservoir	26	Scofield Reservoir
2	Tony Grove Lake	27	Lower Gooseberry Reservoir
3	Hyrum Reservoir	28	Palisade Lake
4	Porcupine Reservoir	29	Nine Mile Reservoir
5	Mantua Reservoir	30	Johnson Valley Reservoir
6	Pineview Reservoir	31	Koosharem Reservoir
7	Bridger Lake	32	Forsyth Reservoir
8	Marsh Lake	33	Mill Meadow Reservoir
9	Echo Reservoir	34	Manning Meadow
10	Lyman Lake	35	Kens Lake
11	China Lake	36	Lower Box Creek Reservoir
12	East Canyon Reservoir	37	Piute Reservoir
13	Browne Reservoir	38	Puffer Lake
14	Spirit Lake	39	Minersville Reservoir
15	Matt Warner	40	Kents Lake
16	Calder Reservoir	41	Labaron Reservoir
17	Mirror Lake	42	Otter Creek Reservoir
18	Mill Hollow Reservoir	43	Red Creek Reservoir (Iron County)
19	Red Fleet Reservoir	44	Yankee Meadow Reservoir
20	Steinaker Reservoir	45	Panguitch Lake
21	Deer Creek Reservoir	46	Recapture Reservoir
22	Brough Reservoir	47	Newcastle Reservoir
23	Utah Lake	48	Navajo Lake
24	Strawberry Reservoir	49	Baker Dam Reservoir
25	Big East Lake	50	Gunlock Reservoir