

### 3.1 INTRODUCTION

Water quality monitoring conducted as part of the Section 305(b) report form the basis of the Division of Water Quality's assessment work. As part of this assessment, the State uses a five-year rotating monitoring program to collect data and to assess the beneficial use support of its waters. The State has been divided into ten watershed management units (Figure 3-1) and aggregated into five monitoring regions (Table 3-1). Each region is monitored on an intensive basis once every five years.

For this assessment cycle, data from intensive monitoring, program monitoring, cooperative monitoring the statewide assessment consists of the summary evaluations of intensive monitoring surveys for three watershed management units. These watersheds were the Colorado River Southeast and Bear River Watershed Management Units.

Use support of beneficial uses was arrived at using chemical, physical, biological data and other information collected by the DWQ, Cooperating Agencies, and other entities involved in collecting data related to water quality. Federal and other public agencies involved with cooperative monitoring agreements or providing information used during this cycle to assess beneficial use support are listed below:

1. United States Forest Service
2. United States Bureau of Land Management
3. Salt Lake City
4. United States National Park Service
5. Central Utah Water Conservancy District.
6. United States Geological Survey
7. Salt Lake County
8. Provo River Watershed Council

### 3.2 STATEWIDE FISH CONSUMPTION ADVISORIES

Fish consumption advisories were placed on the Assessment Units shown in Table 3-2. With the exception of Newcastle Reservoir and Utah Lake, these AUs are not listed on the 303(d) list as being impaired for mercury. Fish samples from these AUs exceeded the Utah Department of Health's level of 3 mg/kg, or 0.3 ug/g wet weight, but only the concentrations in New Castle Reservoir exceeded the United States Food and Drug Administration (FDA) value of 1.0 mg/kg. If any fish consumption advisory exceeds the FDA's standard, the AU is listed on the 303(d) list. The Utah Lake consumption advisory is based on PCBs.

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### 3.3 STATEWIDE ASSESSMENT RESULTS: STREAMS

Table 3-3 lists the size and number of streams assigned to the assessment categories.

Of the 10,534 stream miles assessed (all Categories except 3), 69% are fully supporting and 31% are impaired for at least one beneficial use (Figure 3-2). For the majority of streams, the Class 2 beneficial use (protected for contact recreation) was not assessed because bacteriological data were not available. Class 2 waters with this classification were only considered assessed if adequate bacteriological data and pH were collected. For 2010, bacteriological data were collected from the Provo River, Emigration Creek, Parley's Canyon Creek, and the North Fork of the Virgin River.

Table 3-4 shows the miles and support status for streams for each beneficial use class. Table 3-5 and Figure 3-3 shows summarizes for the causes of non support for streams. Table 3-6 summarizes the sources for the causes of non support for streams. The majority of the sources identified are unverified by either field or analytical data.

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### 3.4 STATEWIDE ASSESSMENT RESULTS: LAKES

#### **3.4.1 Introduction**

Throughout this report, the term "lakes" is used to generically describe lakes and reservoirs. Lake eutrophication is a naturally occurring aging process that is often accelerated by human activities. Through a growing public awareness of this problem, Congress passed legislation in 1972 (Section 314 of the Federal Water Pollution Control Act) mandating states to inventory and classify their lakes according to trophic condition. States were initially to develop a ranking system used to prioritize the lakes for potential protective or restorative projects. This system was more recently replaced with the 1987 Clean Water Act Amendments requiring biannual 305(b) assessments and a concomitant 303(d) list of impaired waters.

Over three thousand assessment units, i.e. lakes, reservoirs, and wetlands, were identified in the initial Utah's Clean Lakes inventory. (State of Utah Clean Lakes Inventory and Classification, Volumes I & I, April 1982). Table 3-7 shows the number and acreage of lakes by size class for Utah. Seventy-seven percent of the total surface acres of Utah's lakes are found in six lakes and reservoirs, Bear Lake, Utah Lake, Flaming Gorge Reservoir, Lake Powell, Strawberry Reservoir, and Sevier Bridge Reservoir.

Lakes selected for further study and evaluation ("significant lakes") were chosen according to the following criteria. The assessment unit is any publicly owned lake/reservoir/pond with a surface area equal to or greater than 50 acres with the following characteristics: (1) accessibility to the public is provided; (2) beneficial use status has been defined or is anticipated to protect water quality for public benefit; and (3) the lake provides important recreational benefit to the public. Marshes, springs, waterfowl management areas and intermittent lakes were not considered in the report. Exceptions in size were made in cases of high recreation use. Under these guidelines a list of 127 lakes and reservoirs was developed.

DWQ is in the process of developing a monitoring and assessment strategy for Great Salt Lake (GSL), including site specific thresholds and standards that are appropriate to each bay and associated transitional wetlands identified in R317-2-6.5. GSL was assessed as having insufficient data but an assessment plan is in place (Category 3c). GSL substantially varies in size depending on the hydrological cycle of the streams that enter the lake.

Utah DWQ assessed 132 lakes and reservoirs for this 2010 reporting cycle based on data collected between January 1, 2007 and December 31, 2008 (73 lakes) or previously collected data if no new data was available. The methodology is described in DWQ's *Part 1 Water Quality Assessment Guidance*. Water quality assessment includes determination of Carlson's trophic state index (TSI), dissolved oxygen concentrations throughout the water column, phytoplankton species dominance, reported fish kills, and water quality trends. General ambient water quality conditions of Utah's lakes and reservoirs vary greatly in relation to their respective watersheds and lake morphometry. Nutrient concentrations and trophic status range from the oligotrophic conditions of many high mountain lakes to highly eutrophic downstream lakes. Water chemistry varies from extremely soft water conditions of the high Uinta lakes to highly saline conditions in reservoirs on the lower Sevier drainage.

Many lakes experience problems relating to thermal stratification and subsequent depletion of dissolved oxygen (DO) in lower strata. This oxygen depletion is often linked to excessive algal production and can result in fish kills. Many lakes and reservoirs also have aesthetic and recreational use impairment because of severe annual drawdown. Such drawdown's leave expanses of exposed lake bed and potentially insufficient waters for overwintering fish populations.

Historically, one half, or about 65 lakes were sampled each year. Hence, 132 lakes were sampled over a two-year assessment period. Sampling was typically performed during two visits between June and September for the year it was scheduled. Additional samples collected during the winter are also available for some AUs. DWQ is currently transitioning to a probabilistic monitoring program that focuses on individual basins as compared to the existing census approach. Focusing on individual basins will provide data for more statistically rigorous assessments in the sampled basins. Select lakes and reservoirs from other basins will continue to be sampled where previous monitoring has identified water quality issues.

### **3.4.2 Lake Support Status**

Of the 469,070 acres of lakes assessed, 67% are fully supporting and 33% are impaired for at least one beneficial use (Figure 3-4). Table 3-8 summarizes the acres for each support Category. Table 3-9 shows the acres and support status for lakes for each beneficial use class. Table 3-10 and Figure 3-5 summarizes the causes for non support for lakes. Table 3-11 summarizes the sources for the causes of non support for lakes. Utah Lake is the only lake impaired for PCBs and total dissolved solids. The majority of the sources identified are unverified by either field or analytical data.

### **3.4.3 Lake Trophic Status**

Table 3-12 summarizes the trophic status of Utah's lakes. Trophic status was estimated using the TSI. The methodology for calculating the TSI changed for 2010. The reported TSI for 2010 is based on Chl-a whereas prior reporting cycles averaged the TSI based on secchi disk depth (TSI-SD), Chl-a (TSI-Chla), and total phosphorus (TSI-TP). One concern of switching methods is comparability to previous cycles. To address this concern, TSI's were calculated using the 2010 data using both the new and old method. The TSI's for most lakes were similar between methods but for some lakes, was notably different. These individual differences are discussed in the watershed-specific chapters (e.g., Chapter 4).

Figures 3-6 and 3-7 show the percentage of lakes classified as oligotrophic, mesotrophic, eutrophic, or hypereutrophic using the old and 2010 TSI methods, respectively. The primary difference observed between methods was a shift from mesotrophic to eutrophic. This shift was attributed to the influence of secchi disk measurements used in the old method of calculating TSI. Secchi disk measurements measure light attenuation that can be caused by algae or turbidity. The old method of calculating TSI erroneously attributed light attenuation

to algae growth for some lakes that likely have non-algal causes of light attenuation. This would result in an artificially high TSI and trophic status classification. No lakes were classified as hypereutrophic using the old method but two were classified as hypereutrophic using the 2010 method.

#### **3.4.4 Toxics Evaluation for Lakes and Reservoirs**

Seventy two lakes/reservoirs were assessed for toxic metals during this reporting cycle. Because of the association of metal solubility with decreasing reduction/oxidation potential at the sediment-water interface, samples were collected approximately 0.5 m above the bottom of the lake or reservoir. Although some tributary stream segments have been identified as impaired with various toxic metals, no lake samples contained metal concentrations above the chronic water quality standards. As discussed in Section 3.2.1, several lakes have fish consumption advisories for mercury.

#### **3.4.5 Acidification of Lakes and Reservoirs**

In 1986, the Acid Deposition Technical Advisory Committee recommended that reconnaissance surveys be conducted in areas considered potentially sensitive to acid deposition. In response to this recommendation, a cooperative agreement involving private individuals, private industries, and several State and Federal agencies was developed and approved. This agreement organized efforts to sample selected streams and lakes in ten different mountain ranges in Utah during the summer of 1987. The water chemistry data were then used to determine the Acid Neutralizing Capacity (ANC) of the sampled lakes and streams and their sensitivity to acid deposition. Generally, it was concluded that several of the high lakes in the State, were susceptible to acid precipitation due to their low buffering capacities but currently, none were actually affected by acid deposition.

Three lakes or reservoirs were identified as having low pH (less than 6.5) for this reporting cycle: Cleveland Reservoir, Lost Creek Reservoir, and Trial Lake. This is the first time low pH was measured in these lakes. DWQ is currently investigating the reasons for the low pH in Cleveland Reservoir and Trial Lake. Lost Creek Reservoir exhibited a metalimnetic oxygen minimum with a negative heterograde curve that is suspected to be caused by heterotrophic bacterial metabolism (Figure 5-2).

## **TABLES**

**Table 3-1 Water Quality Monitoring Regions**

<b>Water Quality Monitoring Regions</b>	
<b>Region</b>	<b>Management Units</b>
1	Bear River, Weber River, Great Salt Lake Desert/Columbia (northern portion of the GSL Desert)
2	Jordan River, Great Salt Lake Desert (southern portion of Great Salt Lake)
3	Uinta
4	Sevier River, Cedar/Beaver, Lower Colorado
5	Colorado River West, Colorado River Southeast

**Table 3-2 Assessment Units That Have Fish Consumption Advisories**

<b>Assessment Units That Have Fish Consumption Advisories</b>		
<b>Watershed</b>	<b>Assessment</b>	<b>Assessment</b>
	<b>Unit</b>	<b>Unit</b>
	<b>ID</b>	<b>Name</b>
Bear River	UT-L-16010203-009	Porcupine Reservoir
Cedar / Beaver River	UT-L-16030006-008	Newcastle Reservoir
Cedar / Beaver River	UT-L-16030006-002	Upper Enterprise Reservoir
Colorado River West	UT-L-14060009-017	Joes Valley Reservoir
Colorado River West	UT14070005-007	Calf Creek
Colorado River West	UT14070005-004	Pine Creek
Jordan River / Utah Lake	UT-L-16020203-003	Jordanelle Reservoir
Jordan River / Utah Lake	UT-L-16020201-004	Utah Lake
Lower Colorado River	UT-L-15010008-001	Gunlock Reservoir
Lower Colorado River		Sand Hollow Reservoir <sup>1</sup>
Sevier River	UT16030002-005	East Fork Sevier-4
Colorado River Southeast	UT14030005-005	Mill Creek-1

<b>Assessment Units That Have Fish Consumption Advisories</b>		
Uinta Basin	UT-L-14060002-006	Red Fleet Reservoir
Uinta Basin	UT-L-14060002-004	Steinaker Reservoir
Uinta Basin	UT14060005-008	Rock Creek
Uinta Basin	UT14060005-009	Green River-3
Weber River	UT16020102-022	Weber River-6
<sup>1</sup> New reservoir in 2003 and no other data currently available		

**Table 3-3 Summary of Streams by Category – State Wide**

<b>Summary of Streams by Category – State Wide</b>		
<b>Category</b>	<b>Stream Miles</b>	<b>Number of Assessment Units</b>
1	92	6
2	7,143	256
3	2,658	269
4A	1,024	38
4B	0	0
4C	128	4
5	2,170	101

**Table 3-4 Support Status for Miles of Streams for Each Beneficial Use Class**

Support Status for Miles of Streams for Each Beneficial Use Class							
USE	Size Assessed	Size Assessed	Size Fully Supporting	Size Fully Supporting and Threatened	Size Not Supporting	Size Not Assessed	Size with Insufficient Info
Agricultural	12,780	10,062	9,101	0	960	2,682	36
Cold Water Aquatic Life	9,592	7,782	5,961	0	1,821	1,801	8
Domestic Water Supply	4,900	4,170	3,979	0	191	730	0
Non-Game Fish and Other Aquatic Life	1,508	1,028	814	0	214	361	119
Primary Recreation	31	0	0	0	0	31	0
Secondary Recreation	13,184	403	200	0	202	12,676	105
Warm Water Aquatic Life	2,203	1,658	1,011	0	647	538	7
Wildlife Habitat	572	463	402	0	62	100	7

**Table 3-5**

**Causes of Non Supporting Streams**

<b>Causes of Non Supporting Streams</b>	
<b>Cause</b>	<b>Miles</b>
<b>PATHOGENS</b>	<b>115</b>
Escherichia coli	107
Fecal Coliform	7
<b>BIOLOGIC INTEGRITY (BIOASSESSMENTS)</b>	<b>778</b>
Benthic-Macroinvertebrate Bioassessments	778
<b>OXYGEN DEPLETION</b>	<b>119</b>
Oxygen, Dissolved	119
<b>FLOW ALTERATIONS</b>	<b>100</b>
Low flow alterations	3
Other flow regime alterations	97
<b>HABITAT ALTERATIONS (INCLUDING WETLANDS)</b>	<b>655</b>
Physical substrate habitat alterations	655
<b>THERMAL IMPACTS</b>	<b>877</b>
Temperature, water	877
<b>NUTRIENTS (Macronutrients/Growth Factors)</b>	<b>865</b>
Ammonia (Un-ionized)	7
Phosphorus (Total)	865

Causes of Non Supporting Streams	
Cause	Miles
TOXIC INORGANICS	567
Ammonia (Un-ionized)	7
Arsenic	123
Boron	234
Cadmium	26
Selenium	298
Zinc	43
METALS	524
Boron	234
Cadmium	26
Radium	22
Selenium	298
Zinc	43
MINERALIZATION	769
Total Dissolved Solids	769
pH/ACIDITY/CAUSTIC CONDITIONS	88
pH	88

Causes of Non Supporting Streams	
Cause	Miles
RADIATION	22
Radium	22
SEDIMENTATION	596
Sedimentation/Siltation	596
Group 1x	7
Fecal Coliform	7

**Table 3-6**

**Source Summary for Non Supporting Streams (Majority Unverified)**

Source Summary for Non Supporting Streams (Majority Unverified)	
Source	Miles
AGRICULTURE-ANIMAL FEEDING/HANDLING OPERATIONS (NPS - NOT REGULATED)	1,594
Aquaculture (Permitted)	126
Agriculture	1,594
AGRICULTURE-CROP PRODUCTION	1,594
Irrigated Crop Production	180
Agriculture	1,594
AGRICULTURE-GRAZING-RELATED SOURCES	1,646
Grazing in Riparian or Shoreline Zones	84
Rangeland Grazing	35
Livestock (Grazing or Feeding Operations)	113
Agriculture	1,594
CONSTRUCTION	35
Site Clearance (Land Development or Redevelopment)	35
HABITAT ALTERATIONS (NOT DIRECTLY RELATED TO HYDROMODIFICATION)	711
Habitat Modification - other than Hydromodification	711

<b>Source Summary for Non Supporting Streams (Majority Unverified)</b>	
HYDROMODIFICATION	3
Flow Alterations from Water Diversions	3
INDUSTRIAL PERMITTED DISCHARGES	119
Industrial Point Source Discharge	119
LAND APPLICATION/WASTE SITES	4
On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	4
MUNICIPAL PERMITTED DISCHARGES (DIRECT AND INDIRECT)	147
Municipal Point Source Discharges	147
STORMWATER PERMITTED DISCHARGES (DIRECT AND INDIRECT)	35
Site Clearance (Land Development or Redevelopment)	35
NATURAL	1,269
Drought-related Impacts	58
Natural Sources	1,228
RECREATION AND TOURISM (NON-BOATING)	35
Other Recreational Pollution Sources	35

**Source Summary for Non Supporting Streams**

**(Majority Unverified)**

URBAN-RELATED RUNOFF/STORMWATER (OTHER THAN REGULATED DISCHARGES)	157
Site Clearance (Land Development or Redevelopment)	35
Wastes from Pets	11
Urban Runoff/Storm Sewers	145
OTHER	3,127
Source Unknown	1,671
Sources Outside State Jurisdiction or Borders	136
Natural Sources	1,157
Agriculture	1,594
Habitat Modification - other than Hydromodification	711

**Table 3-7 Utah Freshwater Lakes and Reservoirs by Size Class Showing Numbers, Surface Acres and Percent of Total Lake Surface**

Utah Freshwater Lakes and Reservoirs by Size Class Showing Numbers, Surface Acres, and Percent of Total Lake Surface.		
Size Class (Surface Acres)	Number of Lakes / Reservoirs	Total Surface Acres
10,000 and greater	6 (0.2%)	370,905 (77.0%)
5,000 - 9,999	2 (0.07%)	15,584 (3.2%)
1,000 - 4,999	18 (0.6%)	34,119 (7.1%)
500 - 999	17 (0.57%)	12,475 (2.6%)
100 - 499	87 (2.9%)	19,890 (4.1%)
50 - 99	68 (2.3%)	4,594 (1.0%)
20 - 49	202 (6.7%)	5,871 (1.2%)
20 or less	2600 (86.7%)	18,200 (3.8%)
Total	3,000	481,638

**Table 3-8 Summary of Lakes and Reservoirs by Category**

<b>Summary of Lakes and Reservoirs by Category</b>		
<b>Category</b>	<b>Acres</b>	<b>Number of Assessment Units</b>
1	162,700	1
2	153,854	76
3	3,668	31
4A	10,587	16
4B	0	0
4C	0	0
5	141,929	41

**Table 3-9 Support Status for Acres of Lakes and Reservoirs for Each Beneficial Use Class**

Support Status for Acres of Lakes and Reservoirs for Each Beneficial Use Class							
USE	Total Size	Size Assessed	Size Fully Supporting	Size Fully Supporting and Threatened	Size Not Supporting	Size Not Assessed	Size with Insufficient Info
Agricultural	472,220	464,052	367,152	0	96,900	8,168	0
Cold Water Aquatic Life	176,843	172,183	125,697	0	46,486	2,322	2,338
Domestic Water Supply	254,208	254,208	254,208	0	0	0	0
Non-Game Fish and Other Aquatic Life	1,931	1,287	1,287	0	0	644	0
Primary Recreation	303,604	162,700	162,700	0	0	140,904	0
Secondary Recreation	467,849	163,050	162,700	0	350	304,799	0
Warm Water Aquatic Life	293,937	283,115	177,085	0	106,030	10,702	120

**Support Status for Acres of Lakes and Reservoirs for Each Beneficial Use Class**

<b>USE</b>	<b>Total Size</b>	<b>Size Assessed</b>	<b>Size Fully Supporting</b>	<b>Size Fully Supporting and Threatened</b>	<b>Size Not Supporting</b>	<b>Size Not Assessed</b>	<b>Size with Insufficient Info</b>
Wildlife Habitat	115,642	10,990	10,990	0	0	104,652	0

**Table 3-10 Causes of Non Supporting Lakes and Reservoirs**

<b>Causes of Non Supporting Lakes and Reservoirs</b>	
<b>Cause</b>	<b>Total Size</b>
OXYGEN DEPLETION	47,280
Oxygen, Dissolved	47,280
THERMAL IMPACTS	21,976
Temperature, water	21,976
NUTRIENTS (Macronutrients/Growth Factors)	140,425
Phosphorus (Total)	140,425
TOXIC ORGANICS	96,900
PCB in Fish Tissue	96,900
METALS	163
Mercury in Fish Tissue	163
MINERALIZATION	96,900
Total Dissolved Solids	96,900
pH/ACIDITY/CAUSTIC CONDITIONS	10,193
pH	10,193

**Table 3-11 Source Summary for Non Supporting Lakes and Reservoirs (Majority Unverified)**

<b>Source Summary for Non Supporting Lakes and Reservoirs (Majority Unverified)</b>	
<b>Source</b>	<b>Acres</b>
<b>AGRICULTURE-ANIMAL FEEDING/HANDLING OPERATIONS (NPS - NOT REGULATED)</b>	<b>115,970</b>
Animal Feeding Operations (NPS)	101,168
Aquaculture (Permitted)	4,490
Managed Pasture Grazing	115,842
Auction Barns and Off-farm Animal Holding/Management Area	128
Permitted Runoff from Confined Animal Feeding Operations (CAFOs)	1,300
<b>AGRICULTURE-CROP PRODUCTION</b>	<b>106,183</b>
Irrigated Crop Production	105,629
Non-irrigated Crop Production	554
<b>AGRICULTURE-GRAZING-RELATED SOURCES</b>	<b>118,133</b>
Grazing in Riparian or Shoreline Zones	2,709
Managed Pasture Grazing	115,842
Rangeland Grazing	4,986
Livestock (Grazing or Feeding Operations)	1,680

<b>Source Summary for Non Supporting Lakes and Reservoirs (Majority Unverified)</b>	
<b>Source</b>	<b>Acres</b>
<b>CONSTRUCTION</b>	<b>102,376</b>
Highways, Roads, Bridges, Infrastructure (New Construction)	96,900
Site Clearance (Land Development or Redevelopment)	5,476
<b>HABITAT ALTERATIONS (NOT DIRECTLY RELATED TO HYDROMODIFICATION)</b>	<b>266</b>
Channelization	266
<b>HYDROMODIFICATION</b>	<b>266</b>
Channelization	266
<b>INDUSTRIAL PERMITTED DISCHARGES</b>	<b>99,715</b>
Industrial Point Source Discharge	99,715
<b>LAND APPLICATION/WASTE SITES</b>	<b>8,331</b>
On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	2,874
Septage Disposal	5,457
<b>LEGACY/HISTORICAL POLLUTANTS</b>	<b>1,394</b>
Mine Tailings	1,394

<b>Source Summary for Non Supporting Lakes and Reservoirs (Majority Unverified)</b>	
<b>Source</b>	<b>Acres</b>
<b>MUNICIPAL PERMITTED DISCHARGES (DIRECT AND INDIRECT)</b>	<b>100,018</b>
Combined Sewer Overflows	1,394
Municipal Point Source Discharges	99,968
Post-development Erosion and Sedimentation	1,040
<b>STORMWATER PERMITTED DISCHARGES (DIRECT AND INDIRECT)</b>	<b>103,544</b>
Highways, Roads, Bridges, Infrastructure (New Construction)	96,900
Post-development Erosion and Sedimentation	1,040
Auction Barns and Off-farm Animal Holding/Management Area	128
Site Clearance (Land Development or Redevelopment)	5,476
Unspecified Urban Stormwater	98,294
<b>NATURAL</b>	<b>1,394</b>
Natural Sources	1,394
<b>RECREATION AND TOURISM (NON-BOATING)</b>	<b>19,201</b>
Other Recreational Pollution Sources	19,201

<b>Source Summary for Non Supporting Lakes and Reservoirs (Majority Unverified)</b>	
<b>Source</b>	<b>Acres</b>
<b>RESOURCE EXTRACTION</b>	<b>4,209</b>
Mine Tailings	1,394
Subsurface (Hardrock) Mining	2,815
<b>SILVICULTURE-LARGE-SCALE (INDUSTRIAL) FORESTRY</b>	<b>1,655</b>
Silviculture Plantation Management	1,655
<b>SPILLS AND UNPERMITTED DISCHARGES</b>	<b>5,457</b>
Septage Disposal	5,457
<b>URBAN-RELATED RUNOFF/STORMWATER (OTHER THAN REGULATED DISCHARGES)</b>	<b>103,416</b>
Highways, Roads, Bridges, Infrastructure (New Construction)	96,900
Post-development Erosion and Sedimentation	1,040
Site Clearance (Land Development or Redevelopment)	5,476
<b>OTHER</b>	<b>105,321</b>
Source Unknown	103,981
Natural Sources	1,394

**Table 3-12 Summary of Trophic Classifications for Lakes**

<b>Table 3-12 Summary of Trophic Classifications for Lakes</b>		
<b>Trophic Status</b>	<b>Number</b>	<b>Total Size</b>
Hypereutrophic	2	221
Eutrophic	8	105,655
Mesotrophic	27	13,103
Oligotrophic	35	162,373
Unknown	0	0

## FIGURES

# Watershed Management Units

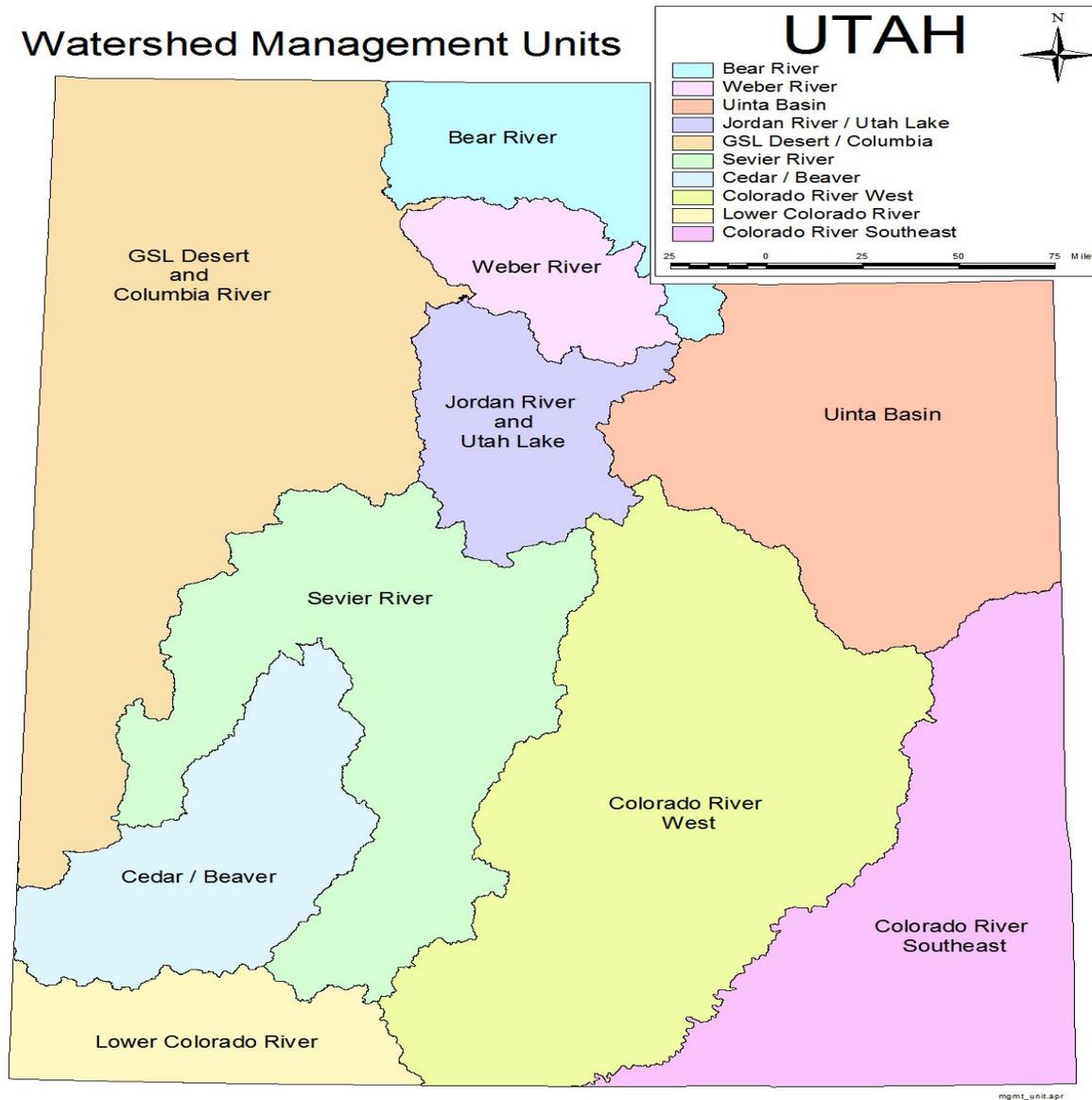


Figure 3-1 Watershed Management Units

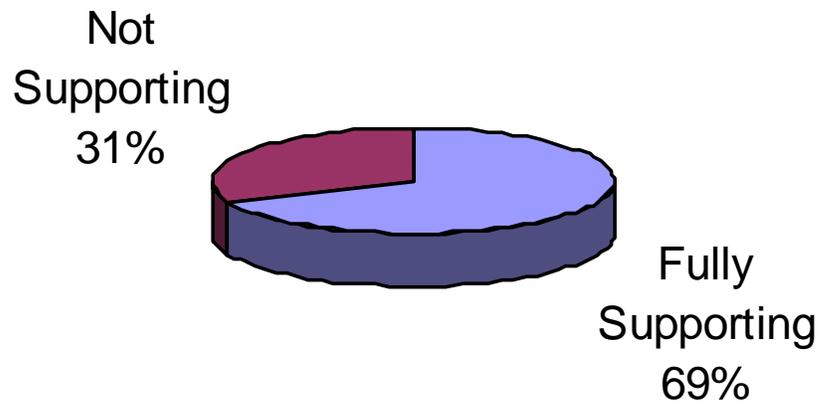


Figure 3-2 Statewide Overall Beneficial Use Support Assessment for Assessed Streams

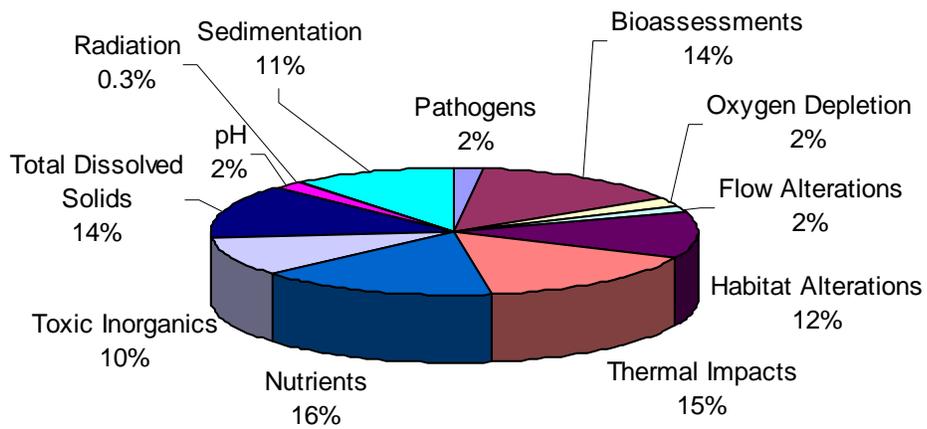


Figure 3-3 Causes for Stream (miles) Impairments

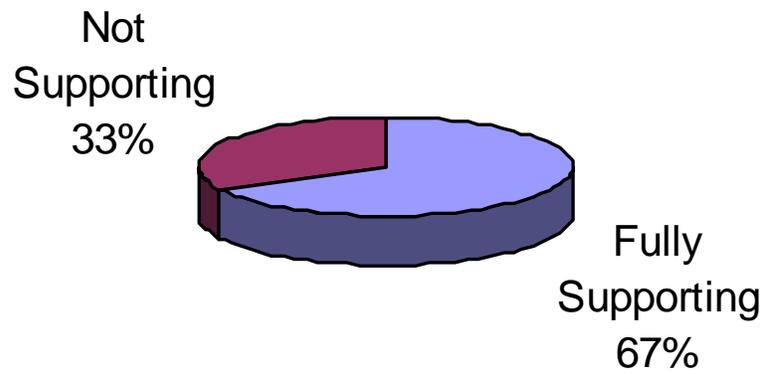


Figure 3-4 Statewide Overall Beneficial Use Support Assessment for Assessed Lakes

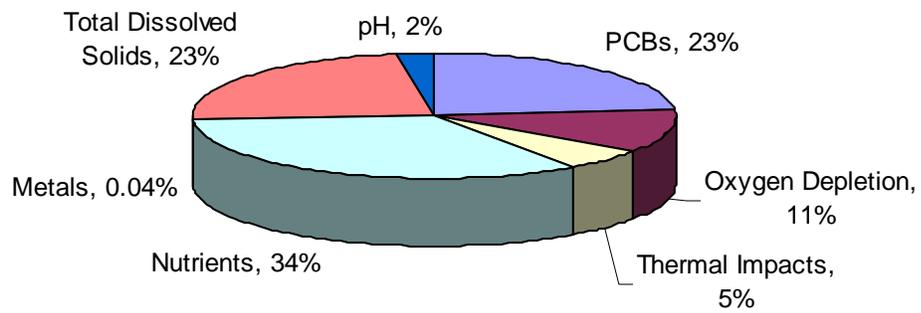
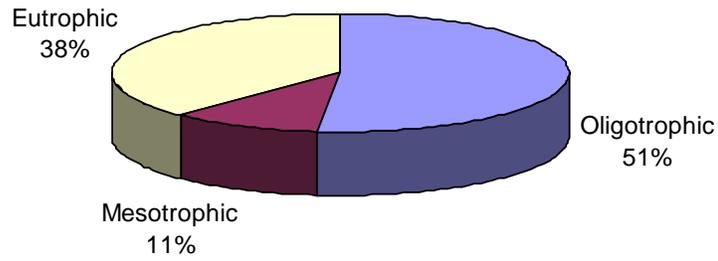
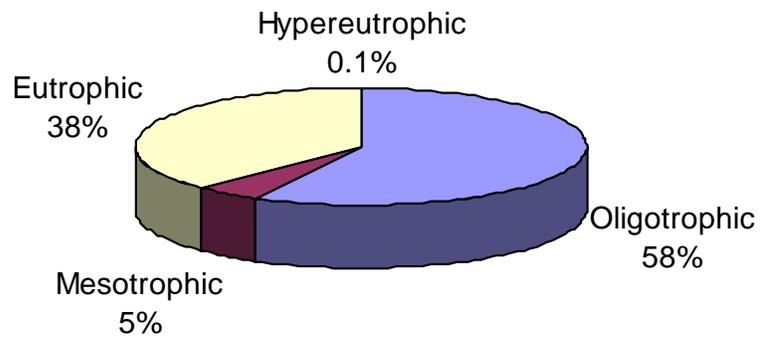


Figure 3-5 Causes for Lake (acres) Impairments



**Figure 3-6 Trophic Status of Lakes (Acres) Using Old Methodology for TSI**



**Figure 3-7 Trophic Status of Lakes (Acres) Using 2010 Methodology for TSI**