# PART 2

# Draft 2010 Utah Integrated Report

# Water Quality Assessment 305(b) Report

## October, 2010


## Utah Division of Water Quality

## Utah Department of Environmental Quality

# Table of Contents

## List of Tables

## List of Figures

## Appendices

# CHAPTER 1: EXECUTIVE SUMMARY

## 1.1 INTRODUCTION

Utah's surface water resources include 14,250 perennial miles of rivers and streams and over 2000 lakes and reservoirs. Utah is the second driest state in the country and these waters play a major role in the private, commercial and industrial development of the state. They are sources of drinking water, provide enormous recreational opportunities, sustain a wide variety of wildlife, and provide water for agricultural production. An overview of the Utah's waters are listed Table 1-1.

**Table 1-1 Atlas of State's Characteristics**

| Atlas of State's Characteristics | |
|---|---|
| Total Miles of Rivers and Streams | 85,916 |
| -Miles of Perennial Rivers / Streams | 14,250 |
| -Miles of Intermittent Rivers and Streams | 66,649 |
| -Miles of Ditches and Canals | 4,017 |
| | |
| Number of Lakes / Reservoirs / Ponds | 2,085 |
| - Acres of Lakes / Reservoirs / Ponds | 461,717 |
| | |
| Wetlands | |
| - Acres of Freshwater Wetlands | 510,359 |
| -Linear Miles of Wetlands | 1,902 |

Utah assesses the quality of its surface water resources to protect the beneficial uses of drinking water, recreation, agriculture, and aquatic life. Data are compared against State water quality numeric and narrative standards (UAC R317-2) to determine beneficial use support. Assessments are also made using biological and habitat data. These assessments of water quality data are used to identify impaired Assessment Units. The water quality data are also used for Total Maximum Daily Load (TMDL) analyses to establish a plan to restore impaired waters that are not meeting the beneficial uses.

## 1.2 RESULTS

Utah uses a basin rotation type of monitoring for its rivers and streams. This allows the State to collect more detailed data that increases confidence in the assessments. The State is divided into five monitoring regions and ten watershed management units. All readily available data collected statewide, including data submitted by entities other than DWQ, are used to make assessments. For the 2010 reporting cycle, data collected from January 1, 2007 through December 31, 2008 were used in addition to data collected from up to ten years ago. If no new data is available for the 2010 reporting cycle, the assessments were made on the available existing data.

### 1.2.1 Fish Consumption Advisories

Seventeen AUs currently have fish consumption advisories, sixteen of which are for mercury and one that is for polychlorinated biphenyls (Table 1-2). Of these, only Newcastle Reservoir is classified as impaired.

**Table 1-2 Assessment Units That Have Fish Consumption Advisories**

| Assessment Units That Have Fish Consumption Advisories | | |
|---|---|---|
| **Watershed** | **Assessment** | **Assessment** |
| | **Unit** | **Unit** |
| | **ID** | **Name** |
| 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[1] |
| Sevier River | UT16030002-005 | East Fork Sevier-4 |
| Colorado River Southeast | UT14030005-005 | Mill Creek-1 |

| Assessment Units That Have Fish Consumption Advisories | | |
|---|---|---|
| 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 |
| [1] New reservoir in 2003 and no other data currently available | | |

### 1.2.2 Streams

Of the 10,434 stream miles assessed, 69 percent are fully supporting and 31 percent are not supporting at least one beneficial use (Figure 1-1).

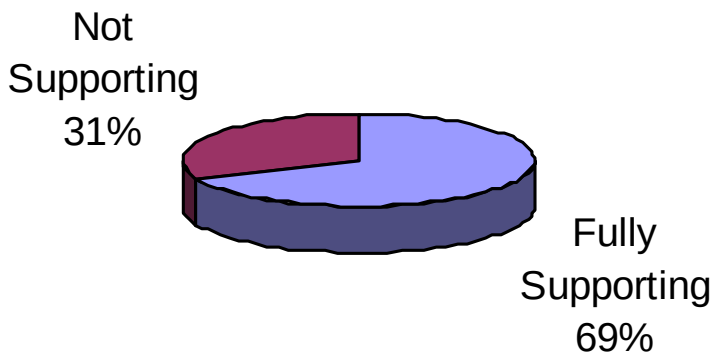


**Figure 1-1 Summary of Support Status for Stream Miles**

### 1.2.3 Lakes

The 132 lakes and reservoirs assessed during this reporting cycle account for 97of the total lake acreage in the state. When accounting by acreage, 67 percent support the designated uses and 33 percent do not support at least one designated beneficial use (Figure 1-2).

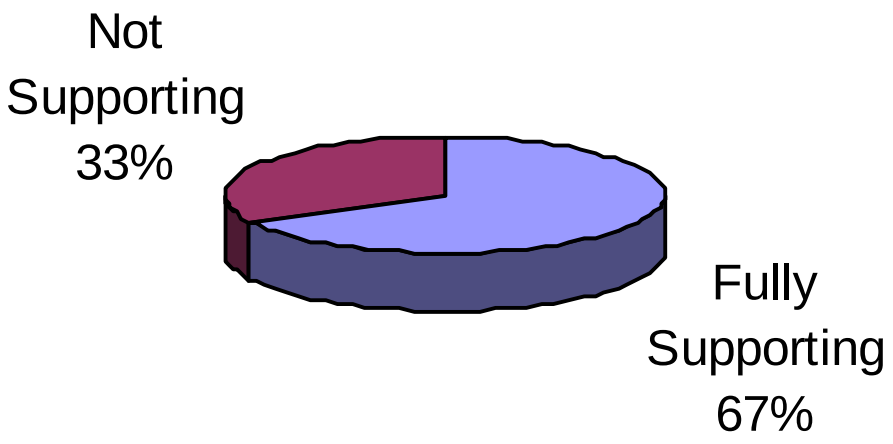


**Figure 1-2 Summary of Lake (acres) Support Status**

# CHAPTER 2: OVERVIEW OF DIVISION OF WATER QUALITY'S WATER QUALITY PROGRAMS

## 2.1 INTRODUCTION

The Utah Division of Utah (DWQ) is responsible for a variety of programs that monitor, assess, and protect the surface and ground waters of the state. DWQ has seven sections to address point sources, nonpoint sources, waste water plant construction, ground water protection, and monitoring. These sections and their attendant responsibilities form the State's water pollution control programs, which are summarized in this chapter.

## 2.2 WATER POLLUTION CONTROL PROGRAMS

### 2.2.1 Watershed Approach - 305(b) Program

Monitoring for the assessment of rivers and streams in the 2010 Integrate Report was based on a 5-year rotating basin approach assess the rivers and streams. The rotating basin approach is derived from 5 aggregates of 10 larger watershed management watersheds and allows efficient intensive monitoring can be conducted in statewide every five years. In addition, DWQ has cooperative monitoring programs with the United States Forest Service, United State Bureau of Land Management, National Park Service, and the local governmental agencies to help augment monitoring conducted by DWQ. These monitoring needs are subsequently compiled into a yearly water quality monitoring to efficiently allocate monitoring resources throughout the year. This monitoring plan identifies each of the sites that are to be monitored and what parameters are to be obtained in the field and analyzed for in the laboratory.

### 2.2.2 Clean Lakes Program - 314 Program

Assessments of lakes for the 2010 Integrated Report was based on a monitoring approach where DWQ conducted biennial monitoring of all priority lakes and reservoirs. Approximately, half of the lakes are monitored during the odd and even number years. However, if additional data are required to develop a Total Maximum Daily Load (TMDL) analysis for a lake or reservoir, the monitoring frequency and additional sites are incorporated into the monitoring scheme to obtain more data.

### 2.2.3. Nonpoint Source Program Overview -319 Program

The mission of the Utah Nonpoint Source Pollution Management Program is to support the environmental protection goals of the state as described in the Utah Administrative Code R317-2 in part to: 1) to conserve the waters of the state, 2) to protect, maintain, and improve the quality of the waters of the state for public water supplies, species protection and propagation and for other designated uses; and 3) to provide for the prevention, abatement and control of new or existing sources of polluted runoff. The Utah NPS Management Program works to achieve these goals by working in concert with numerous local, state and federal agencies and private parties to perform the objectives and tasks identified in the NPS Pollution Management Plan.

Nonpoint source pollution generally originates from sources rather than from a discrete point such as a pipe. Sources include land runoff, percolation, precipitation or atmospheric deposition. Rain and other forms of precipitation wash pollutants from the air and land and into our streams, lakes, reservoirs and groundwater. Such pollutants can include sediment, nutrients, pathogens (bacteria and viruses), toxic chemicals, pesticides, oil,

grease, salt and heavy metals. In Utah our most common problems are sediment, nutrients, metals, salts and pathogens. These pollutants alter the chemical, physical and biological quality of the water and can impair their designated uses.

Some common sources of NPS pollution include various agricultural activities, natural sources, runoff from parking lots and streets and residential areas, mining and forestry operations, recreational activities, underground wastewater treatment systems, construction and stream/riparian habitat degradation and other forms of hydrologic modification.

The Utah Department of Environmental Quality and Utah Department of Agriculture & Food are working together in a partnership with commodity groups and farm organizations in the development of an Air Quality Strategy similar to the AFO/CAFO strategy developed for water quality. DEQ has signed an MOU with EPA which establishes a collaborative working relationship to develop and implement the Utah Animal Feeding Operation Air Quality Strategy. The purposes of the strategy are to gather air emissions information from AFOs and implement programs to reduce emissions.

The NPS staff and Task Force partnership will continue to support TMDL development and implementation through the watershed approach in dealing with the NPS challenges in Utah. This program will continue to utilize the local delivery system of the Utah Conservation Districts and other entities such as counties, water conservancy districts to assist with planning and implementation of best management practices to meet Total Maximum Daily Loads contained in their respective TMDL Plans and watershed-based implementation plans. This is being carried out through the establishment of more local watershed coordinators in priority watersheds where TMDLs have been approved by EPA and are being implemented.

### 2.2.4 Water Quality Standards Program

In 2007, the triennial review was initiated. The process included the creation of a Water Quality Standards Work Group composed of interested agencies and the public to provide input to the Division. The areas of major concern were total dissolved solids (TDS), *E. coli*, redefinition of the recreational use classifications, antidegradation, and the triennial review process in rule. The next triennial review is 2011.

### 2.2.5 Point Source Control Program

Point source discharges, both municipal and industrial, are regulated through the Utah Pollutant Discharge Elimination System Program (UPDES). Regulatory authority was delegated to the State in July of 1987, and includes permit, compliance, and enforcement authority. In addition to municipal and industrial discharge regulation, program authority was granted for general permits, federal facilities and industrial pretreatment programs. Program authority to issue biosolids (sludge) permits was delegated to Utah in 1996.

Permits are issued for up to five years and reflect both technology-based controls, and where appropriate, water quality based controls using wasteload analyses, current water quality standards and final TMDL results. Water quality parameters for which effluent limitations have been developed to protect the waters of the State include ammonia, total dissolved solids; DO, total residual chlorine, BOD, temperature, various nutrients and toxics.

Upon issuance of a discharge permit, the monitoring phase of the State's UPDES program is initiated to ensure that all conditions of a permit are being met. This includes compliance monitoring. Compliance monitoring requires self-monitoring by the permittee as well as State monitoring to determine if effluent violations are occurring. Self-monitoring results are reported to the State and to EPA in a Discharge Monitoring Report (DMR) that is sent to the State and EPA as required by the permit. Additionally, all UPDES facilities are inspected on a regular basis to determine if they are meeting the conditions of their permit and are being operated in the prescribed manner necessary to ensure that effluents do not cause violation of State water quality standards for receiving water.

The permittee may also be required to implement biomonitoring as part of their discharge permit. Specific rules and guidelines are published in the Division of Water Quality's Enforcement Guidance Document for Whole Effluent Toxicity Control Manual (Utah DWQ, 1991). In general the following standards in conjunction with the volume of the discharge are used in determining whether biomonitoring is required or not: (1) there is a reasonable potential to discharge toxics, and/or (2) the receiving water has a low flow dilution greater than 20; 1, and/or (3) the discharge is intermittent, and/or (4) the receiving water has a use-classification of 3A, 3B, 3C, 3E, or 4.

All permits, new or renewal of a permit must go through waste load allocation analysis and review before they are issued. Based upon the results of the waste load allocation analysis, stricter effluent limitations may be placed on the permittee to ensure that state water quality standards are not violated.

The Utah Pollutant Discharge Elimination System (UPDES) Storm Water Permitting Program requires individual permits or general permits for storm water discharges from: 1. Construction activities; 2. Industrial sites and; 3. Municipal separate storm sewer systems, which meet certain criteria. Each of these programs is implemented somewhat differently as follows:

Control of Storm Water Pollution Associated with Construction Activities

Storm water runoff from construction activities can have a significant impact on water quality. Construction activities can remove vegetation, disturb and compact soils, and largely replace absorbent soils with impermeable roofs, pavements, or shallow sods.

As storm water flows over a construction site, it can pickup sediment, debris, chemicals thermal and other pollutants. Polluted storm water runoff can harm or kill fish and other wildlife, and can increase costs to use the water for municipal, irrigation, or other beneficial uses. Sedimentation from construction activities can destroy aquatic habitat, degrade stream aesthetics, and high intensity runoff can significantly increase stream bank erosion.

The UPDES Storm water program requires operators of construction sites of one acre or larger (including smaller sites that are part of a larger common plan of development) to obtain a permit coverage under the UPDES General Storm Water Permit for Construction Activities. To obtain the required UPDES permit, the operator of construction sites, or of parcels within a larger common plan, must first develop a stormwater pollution prevention plan (SWPPP) and submit a "notice of intent (NOI)" to the Division of Water Quality to obtain the permit coverage. The NOI has been automated and is available for electronic submission on the Internet.

The development and implementation of storm water pollution prevention plans (SWPPP's) is the focus of UPDES storm water permits for regulated construction activities. DWQ, municipalities, and counties evaluate SWPPP's and their implementation through onsite inspections.

Control of Storm Water Pollution Associated with Industrial Activities

Activities that take place at industrial facilities, such as material handling and storage, are often exposed to the weather. As runoff from rain or snowmelt comes into contact with these materials, it picks up pollutants and transports them to nearby storm sewer systems, rivers, lakes, or coastal waters.

In order to minimize the impact of stormwater discharges from industrial facilities, the UPDES program includes an industrial stormwater permitting component. Operators of industrial facilities included in one of the 11 categories of stormwater discharges associated with industrial activity that discharge or have the potential to discharge stormwater to a municipal separate storm sewer system (MS4) or directly to waters of the State require authorization under a the UPDES Storm Water Multi-Sector General Permit, DWQ also includes storm water requirements at many of the facilities with an individual UPDES permit for wastewater discharge. (Construction activity is one of the 11 categories, but because of the nature of its operations, it's discussed separately from the other 10 categories, and is permitted separately.)

The focus is again on the implementation of an SWPPP for the facility. DWQ reviews SWPPP's at the industrial facility.

Municipal Separate Storm Sewer Systems

Under the UPDES storm water program, operators of Medium and regulated small municipal separate storm sewer systems (MS4s) (There are no Large MS4's in Utah) require authorization to discharge pollutants under a UPDES permit.

Medium MS4 operators include Salt Lake County, Salt Lake City and UDOT. They were required to submit comprehensive permit applications and were issued individual permits.

Regulated small MS4 operators have the option of choosing to be covered by an individual permit, a general permit, or a modification of an existing Phase I MS4's individual permit. In the case of the municipalities within Salt Lake County, they chose to be co-permitted with the county. Small MS4's outside of the county chose to obtain general permit coverages.

The MS4 permits require the development and implementation of a Storm Water Management Program (SWMP). These programs must be implemented to address the six minimum controls measures in the permit. The six control measures are as follows:

1. Public Education
2. Public Outreach
3. Illicit Discharge Detection and Elimination
4. Post Construction and Redevelopment Controls
5. Good Housekeeping for Municipal Operations

The MS4 SWMP's are reviewed by DWQ through audits.

### 2.2.6 Total Maximum Daily Load (TMDL) Program

The State of Utah's Total Maximum Daily Load (TMDL) and Watershed Planning Program is focused on restoring the beneficial uses of all of the State's impaired Assessment Units. It is responsible for developing TMDLs for assessment units that are listed on the state's 303(d) list of impaired waters. Through the TMDLs process, the sources of the pollutants of concern are identified and the allowable loads are allocated amongst the various point, non-point, and natural sources. DWQ then develops implementation plans to reduce pollutant loadings and improve water quality.

A key element in restoring the beneficial uses in a watershed is soliciting the involvement and leadership of local stewards through the formation and support of watershed stakeholder groups. TMDL Coordinators are assigned primary coordination responsibilities for one or more of the ten watershed management units within the State. At the initiation of a TMDL water quality study local stakeholders, representatives from the regulated community and relevant partner agencies are invited to participate throughout the entire process, from preliminary data review to implementation plan development. Once the TMDL/Watershed plan is complete the TMDL Coordinators are responsible for ensuring that appropriate limits are incorporated into discharge permits and to assist in obtaining funding to address non-point sources of pollutants. During the implementation phase the TMDL Coordinators are also responsible for tracking and reporting progress towards achieving water quality goals.

There are currently over 30 local watershed groups throughout the State of Utah in various phases of plan development or implementation. These groups are supported by the Utah Watershed Coordinating Council, initiated by the Division of Water Quality to disseminate information, training opportunities and guidance on successful watershed planning and implementation efforts. The Support Team for the Watershed Council is made up of agency representatives from the Utah Association of Conservation Districts, Utah State University Extension Service, Utah Department of Agriculture and Food, and the Natural Resources Conservation Service. In addition, through the support of EPA Section 319 funds nine local watershed coordinators have been hired by local watershed groups to help facilitate the planning and implementation of best management practices in their high priority watershed.

### 2.2.7 Ground Water Protection Program

Utah's Water Quality Board has been dedicated to providing a sound ground water anti-degradation policy for the State of Utah. As a result of this commitment, Administrative Rules for Ground Water Quality Protection (UAC R317-6) were promulgated in 1989 for the protection of Utah's ground water resources. These rules form the basis for a formal program to protect the present and probable future beneficial uses of ground water throughout the state. The intent of the rules is to require a permit for a facility or activity that, during normal operations or activities of the facility, may have a discharge that will affect ground water quality. The Ground Water Protection Section within the Utah Division of Water Quality administers the ground water permitting program. The majority of permits issued are for activities and operations primarily associated with agriculture and mineral extraction. Since 1989, the Ground Water Quality Protection Rules (UAC R317-6) have been revised three times, primarily to update Federal Drinking Water Standards established by EPA, which serve as the basis for Utah's ground water quality standards and permit-specific protection levels. In February 2007, the Water Quality Board approved a rulemaking action to adopt a set of agricultural liner criteria tables into the Ground Water Quality Protection Rules (UAC R317-6). These liner criteria tables are the product of an agricultural stakeholder best available technology

(BAT) work group formed in response to stakeholder feedback regarding more stringent liner requirements for animal wastewater lagoons. The BAT work group was comprised of agricultural stakeholders from Farm Bureau Federation, Utah State University Cooperative Extension Service, Natural Resources Conservation Service, Division of Water Quality, Department of Agriculture and Food, Utah Dairyman Association, and several agricultural producers. The liner criteria tables determine what type of liner is appropriate for any site based on the site-specific risk and vulnerability of contamination to waters of the state, including ground water.

The Ground Water Protection Section conducts annual permit site inspections, reviews quarterly and semi-annual compliance monitoring reports, and if necessary, implements enforcement activities for permit non-compliances. Additionally, the Section was actively involved in the finalization of two multi-million dollar ground water contamination Consent Agreements and associated Natural Resource Damage Claims. DWQ conducts outreach to encourage local governments to institute ground water protection measures.

Ground water quality protection priorities include: the administration of a Statewide Ground Water Protection Program; the annual assessment of ground water quality statewide; the integration of ground water protection measures into local planning; development of new partnerships to protect ground water quality statewide; and the continued commitment in establishing consistent ground water protection measures.

The second primary program administered within the Ground Water Protection Section is the federally-mandated 1422 Underground Injection Control (UIC) Program. The Utah UIC Program regulates underground injection of Class I, III, IV, and V injection wells by prohibiting injection activity which would allow movement of fluid containing any contaminant into underground sources of drinking water (USDWs) if the presence of that contaminant may cause a violation of any primary drinking water regulation (40 CFR Part 141 and Utah Primary Drinking Water Standards R309-200-5), or which may adversely affect the health of persons. Underground Injection means the subsurface emplacement of fluids through a bored, drilled, or driven shaft or a dug hole whose depth is greater than the largest surface dimension, or an improved sinkhole or a subsurface fluid distribution system consisting of an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground (UAC R317-7-2 and 40CFR 144.3).

An Underground Source of Drinking Water or USDW means an aquifer or portion thereof which:

- Supplies any public water system; or
- Contains a sufficient quantity of ground water to supply a public water system; and
- Currently supplies drinking water for human consumption; or
- Contains fewer than 10,000 mg/l total dissolved solids (TDS); and
- Is not an exempted aquifer as designated according to the procedures in 40 CFR 144.7.

As land development continues to increase in Utah, the potential for ground water contamination also increases from storm water drainage wells and from UIC-regulated on-site domestic wastewater disposal systems in communities without sanitary sewer or storm water drainage systems, respectively. Utah is also experiencing an increased interest in and application for subsurface disposal of industrial wastewater brought on by the restrictions in surface discharge through implementation of TMDLs and the Colorado Salinity Forum as well as prohibitions to surface discharge by the US Forest Service. The Utah 1422 UIC Program coordinates with the Utah Source Water Protection Program administered by the Division of Drinking Water by prioritizing its inspection and permitting activity for UIC regulated facilities that lie within ground waster based source water protection zones.

### 2.2.8 Wetlands Assessment Program

The DWQ initiated its wetlands assessment program in 2004 with focus on whether the beneficial use, support for waterfowl and shorebirds and the aquatic life in their food chain, is being fully supported in Great Salt Lake wetlands. The Primary objective is to establish appropriate nutrient criteria for Farmington Bay wetlands. The wetlands program is also developing a rapid assessment method with the anticipation of providing a protocol to be used for 404 permits for use by the US Corps of Engineers and Utah Department of Transportation. This method is currently being developed in the Great Salt Lake basin but its utility will eventually be expanded to statewide use and for 305(b) assessments.

# CHAPTER 3: STATEWIDE WATER QUALITY ASSESSMENT

## 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.

## 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.

## 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**

| Water Quality Monitoring Regions | |
|---|---|
| Region | **Management Units** |
| 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**

| Assessment Units That Have Fish Consumption Advisories | | |
|---|---|---|
| **Watershed** | **Assessment Unit ID** | **Assessment Unit Name** |
| 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[1] |
| Sevier River | UT16030002-005 | East Fork Sevier-4 |
| Colorado River Southeast | UT14030005-005 | Mill Creek-1 |

| Assessment Units That Have Fish Consumption Advisories | | |
|---|---|---|
| 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 |
| [1] New reservoir in 2003 and no other data currently available | | |

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

| Summary of Streams by Category – State Wide | | |
|---|---|---|
| **Category** | **Stream Miles** | **Number of Assessment Units** |
| 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**

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

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

| Summary of Lakes and Reservoirs by Category | | |
|---|---|---|
| **Category** | **Acres** | **Number of Assessment Units** |
| 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 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **USE** | **Total Size** | **Size Assessed** | **Size Fully Supporting** | **Size Fully Supporting and Threatened** | **Size Not Supporting** | **Size Not Assessed** | **Size with Insufficient Info** |
| Wildlife Habitat | 115,642 | 10,990 | 10,990 | 0 | 0 | 104,652 | 0 |

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

| Causes of Non Supporting Lakes and Reservoirs | |
|---|---|
| **Cause** | **Total Size** |
| 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)**

| Source Summary for Non Supporting Lakes and Reservoirs (Majority Unverified) | |
|---|---|
| **Source** | **Acres** |
| AGRICULTURE-ANIMAL FEEDING/HANDLING OPERATIONS (NPS - NOT REGULATED) | 115,970 |
| 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 |
| AGRICULTURE-CROP PRODUCTION | 106,183 |
| Irrigated Crop Production | 105,629 |
| Non-irrigated Crop Production | 554 |
| AGRICULTURE-GRAZING-RELATED SOURCES | 118,133 |
| Grazing in Riparian or Shoreline Zones | 2,709 |
| Managed Pasture Grazing | 115,842 |
| Rangeland Grazing | 4,986 |
| Livestock (Grazing or Feeding Operations) | 1,680 |

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

| Source Summary for Non Supporting Lakes and Reservoirs (Majority Unverified) | |
|---|---|
| **Source** | **Acres** |
| MUNICIPAL PERMITTED DISCHARGES (DIRECT AND INDIRECT) | 100,018 |
| Combined Sewer Overflows | 1,394 |
| Municipal Point Source Discharges | 99,968 |
| Post-development Erosion and Sedimentation | 1,040 |
| STORMWATER PERMITTED DISCHARGES (DIRECT AND INDIRECT) | 103,544 |
| 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 |
| NATURAL | 1,394 |
| Natural Sources | 1,394 |
| RECREATION AND TOURISM (NON-BOATING) | 19,201 |
| Other Recreational Pollution Sources | 19,201 |

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

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

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

# FIGURES

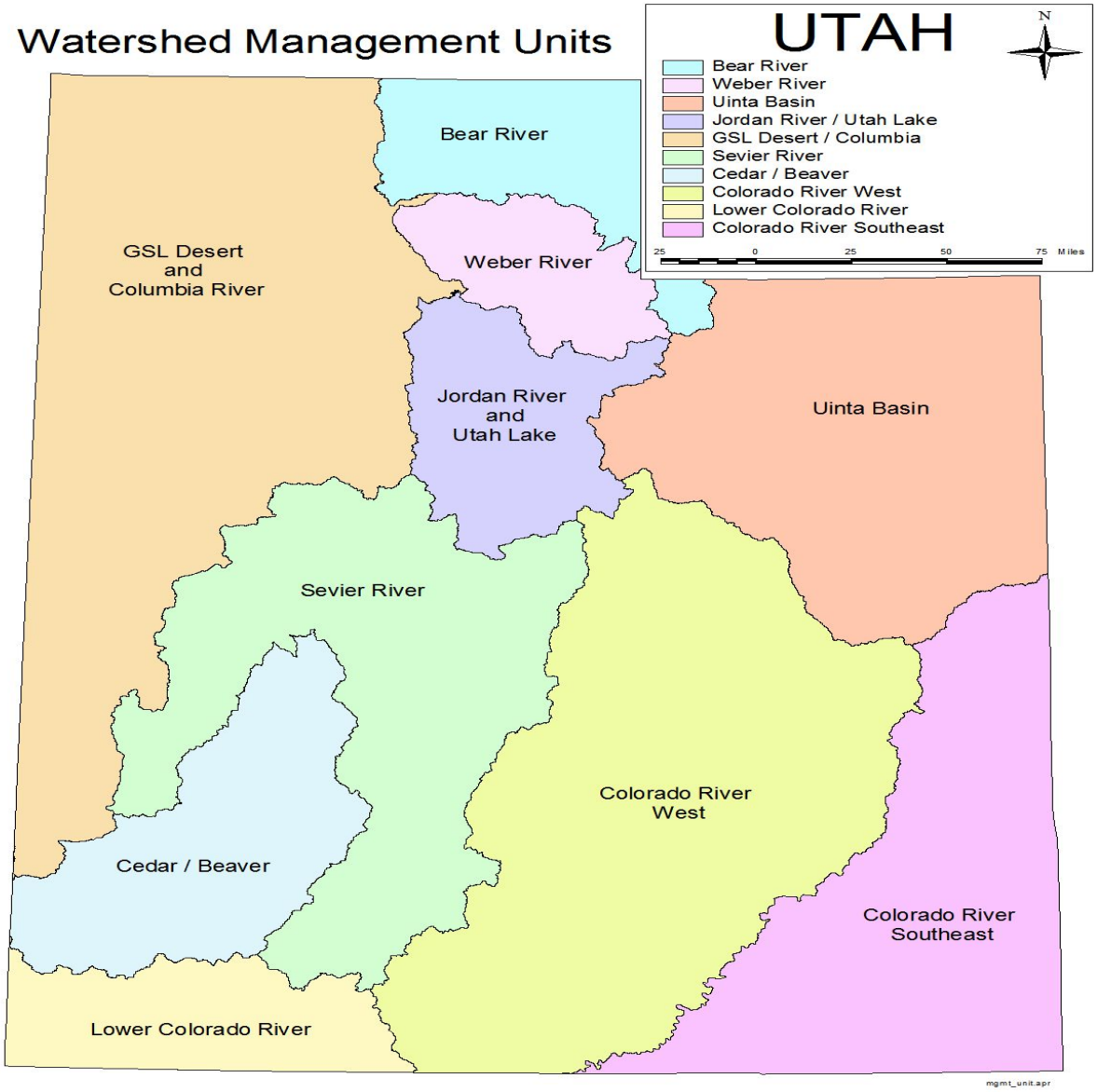


**Figure 3-1 Watershed Management Units**

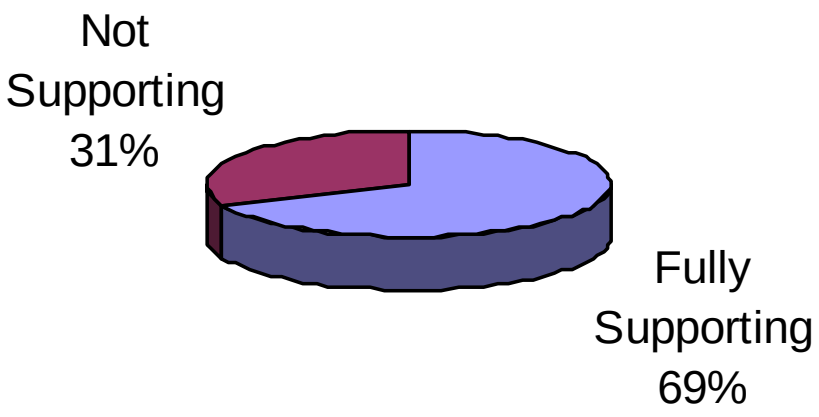


**Figure 3-2 Statewide Overall Beneficial Use Support Assessment for Assessed Streams**

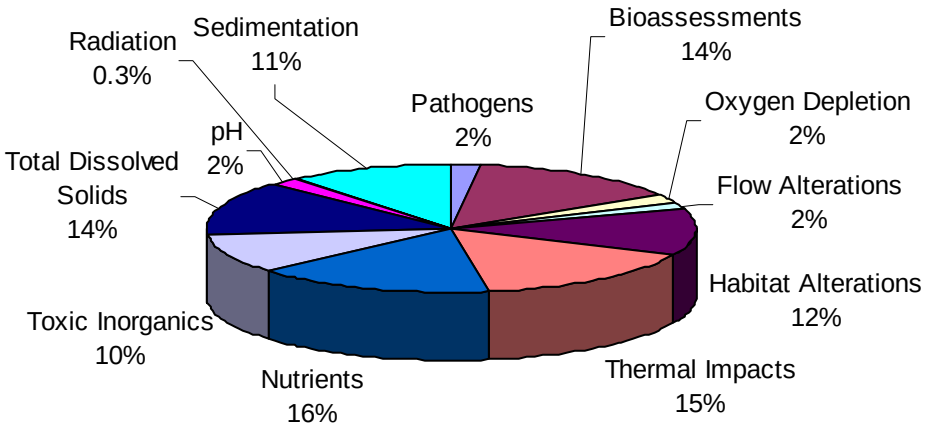


**Figure 3-3 Causes for Stream (miles) Impairments**

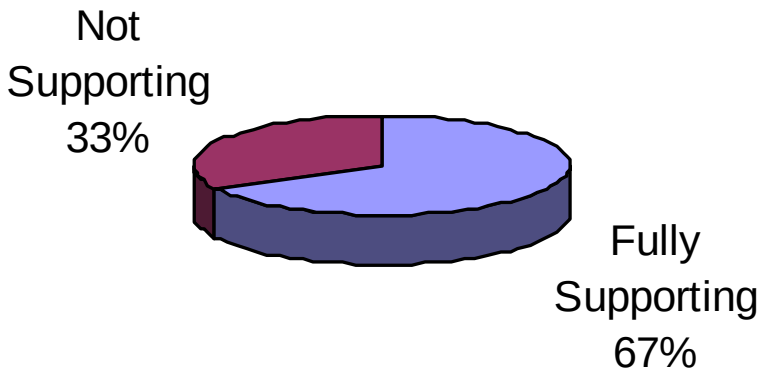


**Figure 3-4 Statewide Overall Beneficial Use Support Assessment for Assessed Lakes**

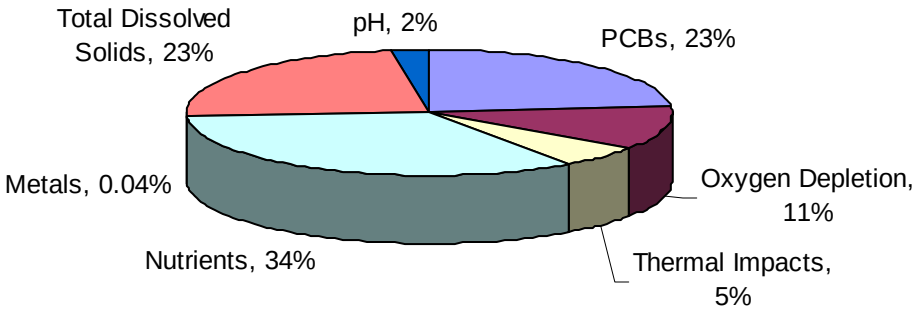


**Figure 3-5 Causes for Lake (acres) Impairments**

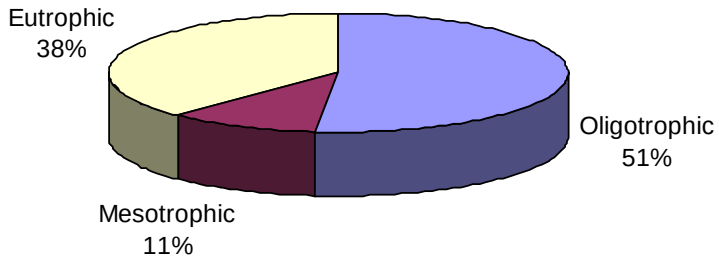


**Figure 3-6 Trophic Status of Lakes (Acres) Using Old Methodology for TSI**

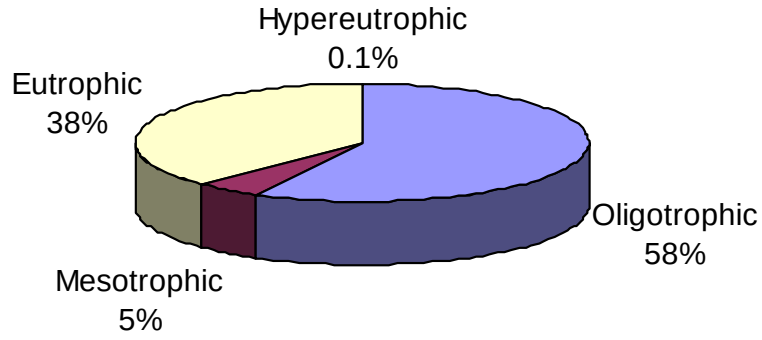


**Figure 3-7 Trophic Status of Lakes (Acres) Using 2010 Methodology for TSI**

# CHAPTER 4: BEAR RIVER WATERSHED MANAGEMENT UNIT

## 4.1 INTRODUCTION

The Bear River Basin is part of the Great Basin Hydrologic region, and is identified by the USGS Hydrological Units (HUCs) listed in Table 4-1. The Bear River is the principal stream within this drainage area. It flows north out of Utah into Wyoming, then back into Utah, returns to Wyoming, then crosses into Idaho, then flows southwest into Utah and empties into the Great Salt Lake. The Bear River is the longest river (approximately 500 miles long) in the United States whose waters do not eventually empty into an ocean. Originally the Bear River did not flow into Bear Lake, but since the early 1900's, it has been diverted into Bear Lake at Stewart Dam. Water flows from Bear Lake into the Bear River via a canal. Other streams of interest in this watershed include the Logan, Blacksmith Fork, Cub River and the Little Bear Rivers.

Biological, water chemistry and field data collected from January 1, 2004 through December 31, 2008 were used to make assessments. Water quality data were compared against standards established for each of the designated beneficial uses. Figure 4-1 shows the beneficial use classifications for the Bear River Watershed Management Unit.

## 4.2 IMPAIRED WATERS

The list of streams and lakes impaired and requiring a TMDL (Category 5; Section 303d) for the Bear River are presented in Table 4-2. New listings for 2010 include Sage Creek, Big Creek, North Eden, Summit Creek Lower and the South Fork Little Bear. None of the streams or lakes on the Section 303d list are now meeting the standards or have an approved TMDL for this cycle. Assessment results for all AUs for streams are presented in Table 4-3 and lakes in Table 4-4. Lake assessments are further discussed in the next section.

## 4.3 LAKE ASSESSMENTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends.

Table 4-5 shows TSIs based on each sample collected from May through September by sample date. Table 4-6 contains a summary of lake trophic status by study periods. Note that some of the changes in TSIs between assessment periods is due to the variability in the lakes and reservoirs and some is due to switching methodologies between 2008 and 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). Table 4-6 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. Small differences were observed for Cutler Reservoir, Little Creek Reservoir, Mantua Reservoir, and Woodruff Creek Reservoir. These small differences suggest little difference in trophic state between the new and older methods.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. Consistent trends that resulted in a net TSI change of five or changes greater than 10 between 2008 and 2010, which are not attributable to the change in TSI methodology alone, are identified. Newton Reservoir appears to have an increasing trend in TSI.

## 4.4 HEALTH ADVISORIES

Porcupine Reservoir has a fish consumption advisory for mercury.

# TABLES

**Table 4-1 USGS Hydrological Units in the Bear River Watershed Management Unit**

| USGS Hydrological Units in the Bear River Watershed Management Unit. | |
|---|---|
| **Hydrological Unit Code** | **Hydrological Unit Name** |
| 16010101 | Upper Bear |
| 16010102 | Central Bear |
| 16010201 | Bear Lake |
| 16010202 | Middle Bear |
| 16010203 | Little Bear - Logan |
| 16010204 | Lower Bear - Malad |

**Table 4-2 Impaired Lakes and Streams Requiring a TMDL in the Bear River Watershed**

| Impaired Lakes and Streams Requiring a TMDL in the Bear River Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16010101-004_00 | Sage Creek | RIVER | 9.094 MILES | Sage Creek and tributaries from confluence with Bear River to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | • Natural Sources<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16010101-007_00 | Big Creek | RIVER | 26.839 MILES | Big Creek and tributaries from Bear River to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water<br><br>pH | 2010<br><br>2006 | Medium Priority<br><br>Medium Priority | Cold Water Aquatic Life<br><br>Agricultural<br><br>Cold Water Aquatic Life<br><br>Secondary Recreation | • Natural Sources<br>• Source Unknown |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16010101-028_00 | Yellow Creek | RIVER | 16.4 MILES | Yellow Creek and tributaries from Utah-Wyoming border to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16010201-002_00 | Laketown | RIVER | 11.458 MILES | Laketown and Big Creek and other tributaries from Bear Lake to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16010201-004_00 | North Eden | RIVER | 15.062 MILES | North Eden Creek and tributaries from Bear Lake to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | • Natural Sources<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16010202-002_00 | Newton Creek | RIVER | 5.159 MILES | Newton Creek from confluence with Cutler Reservoir to Newton Reservoir |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16010202-005_00 | Summit Creek Lower | RIVER | 6.8 MILES | Summit Creek and tributaries from confluence with Bear River to USFS boundary |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | • Hydromodification |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16010203-008_00 | Spring Creek | RIVER | 7.361 MILES | Spring Creek and tributaries from confluence with Little Bear River to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Total Dissolved Solids | 2006 | Low Priority | Agricultural | • Industrial Point Source Discharge |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16010203-009_00 | Little Bear River-1 | RIVER | 16.516 MILES | Little Bear River from Cutler Reservoir to Hyrum Reservoir |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16010203-013_00 | South Fork Little Bear | RIVER | 15.998 MILES | South Fork Little Bear and tributaries from confluence with Little Bear River to headwaters, except Davenport Creek |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | • Source Unknown |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16010204-003_00 | Bear River-1 | RIVER | 17.506 MILES | Bear River from Great Salt Lake to Malad River confluence |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Total Dissolved Solids | 2008 | Low Priority | Agricultural | • Municipal & Industrial Point Source Discharge<br>• Natural Sources |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16010204-006_00 | Malad River-1 | RIVER | 51.961 MILES | Malad River from confluence with Bear River to Utah-Idaho state line |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Non-Game Fish and Other Aquatic Life | • Source Unknown |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT-L-16010202-002_00 | Cutler Reservoir | FRESHWATER LAKE | 7184 ACRES | LL= 414916/1115735 12,13N 1W USGS MAP AND DATE: CUTLER DAM 1964, NEWTON,UTAH 1964 WATERSHED: BEAR RIVER, WMU Bear River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | High Priority | Warm Water Aquatic Life | |
| Phosphorus (Total) | 2006 | High Priority | Warm Water Aquatic Life | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT-L-16010202-013_00 | NEWTON RESERVOIR | FRESHWATER LAKE | 350 ACRES | LL= 415414/1105853 13,14N 1,2W 9,31,32,36 USGS MAP AND DATE: TRENTON, UTAH-1964 WATERSHED: CLARKSTON CREEK, WMU Bear River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2006 | Low Priority | Cold Water Aquatic Life | • Natural Sources |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT-L-16010203-005_00 | Hyrum Reservoir | FRESHWATER LAKE | 438 ACRES | LL= 413714/1115128 10N 1E 7,8 USGS MAP AND DATE: PARADISE-1955 WATERSHED: LITTLE BEAR RIVER, WMU Bear River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 1994 | Low Priority | Cold Water Aquatic Life | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT-L-16010203-012_00 | Tony Grove Lake | FRESHWATER LAKE | 25 ACRES | LL= 415335/1113825 13N 3E 5 USGS MAP AND DATE: NAOMI PEAK, UTAH-1969 WATERSHED: TONY GROVE CREEK, WMU Bear River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | Low Priority | Cold Water Aquatic Life | |
| Temperature, water | 2006 | Low Priority | Cold Water Aquatic Life | |
| pH | 2006 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16010204-033_00 | Mantua Reservoir | FRESHWATER LAKE | 554 ACRES | LL= 413012/1115557 9N 1W 22,23 USGS MAP AND DATE: MOUNT PISGAH 1969 WATERSHED: MAPLE CREEK, WMU Bear River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | |

**Table 4-3 Assessment Results for Bear River Watershed Streams**

| Assessment Results for Bear River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16010101-001_00 | Bear River West | | RIVER | 6.285 MILES | Bear River west side tributaries from Sixmile Creek north | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-002_00 | Six Mile Creek | | RIVER | 15.266 MILES | Sixmile Creek from reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-003_00 | Little Creek | | RIVER | 6.598 MILES | Little Creek and tributaries from confluence with Bear River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-004_00 | Sage Creek | | RIVER | 9.094 MILES | Sage Creek and tributaries from confluence with Bear River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown<br>• Natural Sources |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2010 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-005_00 | Otter Creek | | RIVER | 20.694 MILES | Otter Creek and tributaries from Bear River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-006_00 | Bear River-4 | | RIVER | 55.666 MILES | Bear River from Woodruff Creek north to Sage Creek Junction | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-007_00 | Big Creek | | RIVER | 26.839 MILES | Big Creek and tributaries from Bear River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | pH | 2006 | Medium Priority | • Source Unknown<br>• Natural Sources |
| Cold Water Aquatic Life | Not Supporting | N | pH<br>Temperature, water | 2006<br>2010 | Medium Priority<br>Medium Priority | |
| Secondary Recreation | Not Supporting | N | pH | 2006 | Medium Priority | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-008_00 | North Woodruff | | RIVER | 0.606 MILES | Bear River west side tributaries between Woodruff and Big Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-009_00 | Bear River-5 | | RIVER | 12.241 MILES | Bear River from Woodruff Creek upstream to Utah-Wyoming border | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-010_00 | Birch Creek | | RIVER | 15.82 MILES | Birch Creek and tributaries from confluence with Woodruff Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-011_00 | Woodruff Creek - 1 | | RIVER | 7.64 MILES | Woodruff Creek from mouth to Birch Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-012_00 | Unnamed Creek | | RIVER | 0 MILES | Unnamed tributary to Saleratus Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-013_00 | Woodruff Creek - 4 | | RIVER | 33.818 MILES | Woodruff Creek and tributaries from Woodruff Creek Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-014_00 | Woodruff Creek - 3 | | RIVER | 1.163 MILES | Woodruff Creek Reservoir tributaries excluding Woodruff Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-015_00 | Woodruff Creek - 2 | | RIVER | 4.607 MILES | Woodruff Creek and tributaries from Birch Creek confluence to Woodruff Creek Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-016_00 | Saleratus Creek | | RIVER | 29.047 MILES | Saleratus Creek and tributaries from confluence with Woodruff Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Oxygen, Dissolved | 2006 | Completed | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-017_00 | Dry Creek | | RIVER | 2.77 MILES | Dry Creek and tributaries from confluence with Saleratus Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-018_00 | Sutton Creek | | RIVER | 26.613 MILES | Sutton Creek and tributaries from Utah-Wyoming border to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-019_00 | Yellow Creek Tributaries | | RIVER | 20.812 MILES | Yellow Creek tributaries (e.g. Thief, Chicken, Spring Creeks) above Barker Reservoir and Yellow Creek below Barker Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-021_00 | Bear River-6 | | RIVER | 16.971 MILES | Bear River and tributaries from Utah-Wyoming border to Hayden Fork - Stillwater Fork confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-022_00 | Mill Creek | | RIVER | 55.101 MILES | Mill Creek and tributaries from Utah-Wyoming border to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-023_00 | West Fork Bear River | | RIVER | 66.241 MILES | West Fork Bear River and tributaries from confluence with Bear River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-024_00 | Hayden Fork | | RIVER | 18.076 MILES | Hayden Fork and tributaries from confluence with Stillwater Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-025_00 | Stillwater Fork | | RIVER | 30.354 MILES | Stillwater Fork and tributaries from confluence with Hayden Fork to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-026_00 | East Fork Bear River | | RIVER | 33.722 MILES | East Fork Bear River and tributaries from confluence with Hayden Fork to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-027_00 | Bear River East | | RIVER | 1.406 MILES | Bear River east side tributaries from Woodruff to near Sage Creek Junction | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010101-028_00 | Yellow Creek | | RIVER | 16.4 MILES | Yellow Creek and tributaries from Utah-Wyoming border to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010102-001_00 | Bear River North | | RIVER | 0 MILES | Bear River tributaries in HUC 16010102 | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010201-001_00 | Bear Lake West | | RIVER | 0.01 MILES | Bear Lake west side tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010201-002_00 | Laketown | | RIVER | 11.458 MILES | Laketown and Big Creek and other tributaries from Bear Lake to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010201-003_00 | South Eden | | RIVER | 4.231 MILES | South Eden Creek from Bear Lake to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010201-004_00 | North Eden | | RIVER | 15.062 MILES | North Eden Creek and tributaries from Bear Lake to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown<br>• Natural Sources |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2010 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-001_00 | Worm Creek | | RIVER | 2.5 MILES | Worm Creek from confluence with Cub River to Utah-Idaho state line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-002_00 | Newton Creek | | RIVER | 5.159 MILES | Newton Creek from confluence with Cutler Reservoir to Newton Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Temperature, water | 2006<br>2008 | Completed<br>Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-003_00 | Hopkins Slough | | RIVER | 7.646 MILES | Hopkins Slough from confluence with Bear River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Insufficient Information | N | | | | |
| Wildlife Habitat | Insufficient Information | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-004_00 | Bear River-3 | | RIVER | 27.843 MILES | Bear River from Cutler Reservoir to Idaho state line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture |
| Secondary Recreation | Fully Supporting | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Sedimentation/Siltation | 2006<br>2006 | Completed<br>Completed | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-005_00 | Summit Creek Lower | | RIVER | 6.8 MILES | Summit Creek and tributaries from confluence with Bear River to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2010 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-006_00 | City Creek | | RIVER | 7.304 MILES | City Creek and tributaries and other Bear River east side tributaries south toward Summit Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-007_00 | Cherry Creek | | RIVER | 3.24 MILES | Cherry Creek and tributaries from confluence with Cub River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-008_00 | High Creek Lower | | RIVER | 3.1 MILES | High Creek and tributaries from confluence with Cub River to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Flow Alterations from Water Diversions<br>• Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Low flow alterations<br>Phosphorus (Total) | 2006 | Pollution Completed | • Agriculture |
| Secondary Recreation | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-009_00 | Spring Creek Lewiston | | RIVER | 2.961 MILES | Spring Creek (Lewiston) and tributaries from confluence with Cub River to Utah-Idaho border | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Phosphorus (Total) | 2006 | Completed | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-010_00 | Cub River | | RIVER | 14.306 MILES | Cub River from confluence with Bear River to Utah-Idaho state line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Habitat Modification - other than Hydromodification |
| Secondary Recreation | Fully Supporting | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Sedimentation/Siltation | 2006<br>2006 | Completed<br>Completed | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-011_00 | Summit Creek Upper | | STREAM | 8.354 MILES | Summit Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-012_00 | High Creek Upper | | RIVER | 9.434 MILES | High Creek and tributaries from U.S. Forest Service boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010202-013_00 | Clarkston Creek | | RIVER | 57.796 MILES | Clarkston Creek and tributaries from Newton Reservoir to Utah-Idaho State Line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-001_00 | Cutler West | | RIVER | 1.158 MILES | Cutler Reservoir west side tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-002_00 | Swift Slough | | RIVER | 10.382 MILES | Swift Slough and tributaries from Cutler Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-005_00 | Logan River-1 | | RIVER | 32.194 MILES | Logan River and tributaries, except Blacksmith Fork drainage, from Cutler Reservoir to Third Dam | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Urban Runoff/Storm Sewers |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total) | 2006 | Completed | |
| Secondary Recreation | Insufficient Information | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-006_00 | Logan River-2 | | RIVER | 68.174 MILES | Logan River and tributaries from Third Dam to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-007_00 | Little Bear-3 | | RIVER | 7.041 MILES | Little Bear River west side tributaries from Cutler Reservoir To Hyrum Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-008_00 | Spring Creek | | RIVER | 7.361 MILES | Spring Creek and tributaries from confluence with Little Bear River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2006 | Low Priority | • Industrial Point Source Discharge<br>• Agriculture |
| Cold Water Aquatic Life | Not Supporting | N | Ammonia (Un-ionized)<br>Oxygen, Dissolved<br>Phosphorus (Total)<br>Temperature, water | 2008<br>2006<br>2006<br>2006 | Completed<br>Completed<br>Completed<br>Completed | • Source Unknown |
| Secondary Recreation | Not Supporting | N | Fecal Coliform | 1998 | Completed | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-009_00 | Little Bear River-1 | | RIVER | 16.516 MILES | Little Bear River from Cutler Reservoir to Hyrum Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Temperature, water | 2008<br>2008 | Completed<br>Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-011_00 | Little Bear River-2 | | RIVER | 6.739 MILES | Little Bear River from Hyrum Reservoir to East Fork Little Bear confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-012_00 | East Fork Little Bear | | RIVER | 4.3 MILES | Little Bear River from confluence Little Bear River to Porcupine Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-013_00 | South Fork Little Bear | | RIVER | 15.998 MILES | South Fork Little Bear and tributaries from confluence with Little Bear River to headwaters, except Davenport Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2010 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-014_00 | East Fork Little Bear-1 | | RIVER | 7.033 MILES | East Fork Little Bear River and tributaries from confluence with Little Bear to Porcupine Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-015_00 | Davenport Creek | | RIVER | 28.863 MILES | Davenport Creek and tributaries from confluence with South Fork Little Bear to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-016_00 | Porcupine Creek | | RIVER | 1.488 MILES | Porcupine Creek and tributaries from Porcupine Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-017_00 | East Fork Little Bear-2 | | RIVER | 27.869 MILES | East Fork Little Bear River and tributaries from Porcupine Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-018_00 | Black Smiths Fork-2 | | RIVER | 53.191 MILES | Blacksmith Fork and tributaries from confluence with Left Hand Fork Blacksmith Fork to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-019_00 | Left Hand Fork Blacksmiths Fork | | RIVER | 26.595 MILES | Left Hand Fork Blacksmiths Fork and tributaries from confluence with Blacksmiths Fork to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010203-020_00 | Black Smiths Fork-1 | | RIVER | 10.423 MILES | Blacksmiths Fork and tributaries from confluence with Logan River to Left Hand Fork Blacksmiths Fork | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010204-001_00 | Box Elder Creek-1 | | RIVER | 2.994 MILES | Box Elder Creek from the confluence with Black Slough to Brigham City Reservoir (the Mayor's Pond) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Non-Game Fish and Other Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010204-002_00 | Lower Bear East | | RIVER | 37.142 MILES | Bear River east side tributaries from Malad confluence south | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010204-003_00 | Bear River-1 | | RIVER | 17.506 MILES | Bear River from Great Salt Lake to Malad River confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2008 | Low Priority | • Industrial Point Source Discharge<br>• Municipal Point Source Discharges<br>• Natural Sources<br>• Agriculture |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Phosphorus (Total) | 2006 | Completed | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010204-004_00 | Lower Bear West | | RIVER | 10.876 MILES | Bear River west side tributaries from Malad River confluence south | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010204-005_00 | Box Elder Creek-2 | | RIVER | 6.937 MILES | Box Elder Creek from Brigham City Reservoir (the Mayor's Pond) to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010204-006_00 | Malad River-1 | | RIVER | 51.961 MILES | Malad River from confluence with Bear River to Utah-Idaho state line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Non-Game Fish and Other Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | • Source Unknown |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010204-007_00 | Middle Bear East | | RIVER | 13.899 MILES | Bear River east side tributaries from Malad River confluence north to HUC boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010204-008_00 | Bear River-2 | | RIVER | 41.5 MILES | Bear River from Malad River confluence to Cutler Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Industrial Point Source Discharge<br>• Municipal Point Source Discharges<br>• Agriculture |
| Secondary Recreation | Fully Supporting | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Phosphorus (Total) | 2006 | Completed | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010204-009_00 | Middle Bear West | | RIVER | 3.16 MILES | Tributaries on West Side of Bear River from Malad confluence north to HUC boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16010204-010_00 | Malad River-2 | | RIVER | 17.819 MILES | Malad River tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

**Table 4-4 Assessment Results for Bear River Watershed Lake Assessment Units**

| Assessment Results for Bear River Watershed Lake Assessment Units | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16010201-003 | Bear Lake | 2 | 2 | | FS | FS | FS | | No | | N | FS | FS | FS | FS | FS |
| UT-L-16010101-002 | Birch Creek Reservoir #2 | 2 | 2 | | FS | FS | FS | | P | | N | FS | NS | NS | FS | NS |
| UT-L-16010202-002 | Cutler Reservoir | 5 | 5 | | FS | FS | FS | | TP, TSI | | ND | NS | FS | FS | NS | FS |
| UT-L-16010203-005 | Hyrum Reservoir | 4A | 5 | DO | NS | FS | NS | | No | | N | NS | NS | NS | FS | NS |

**Assessment Results for Bear River Watershed Lake Assessment Units**

| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010 | | | | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DO | pH | T | Other | | | | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16010101-007 | Little Creek Reservoir | 3B | 2 | pH | FS | FS | FS | | TP | | Y | FS | FS | FS | NS | FS |
| UT-L-16010204-033 | Mantua Reservoir | 4 | 5 | pH, T | FS | NS | NS | | No | | Y | NS | NS | NS | NS | NS |
| UT-L-16010202-013 | Newton Reservoir | 4 | 4 | DO | FS | FS | FS | | TP, TSI | | Y | NS | NS | NS | NS | FS |
| UT-L-16010203-009 | Porcupine Reservoir | 2 | 5 | | FS | NS | FS | | No | | N | NS | NS | FS | FS | NS |

**Assessment Results for Bear River Watershed Lake Assessment Units**

| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010 | | | | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DO | pH | T | Other | | | | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16010203-012 | Tony Grove Lake | 5 | 5 | DO, pH | FS | FS | NS | | No | FK | Y | NS | NS | NS | NS | NS |
| UT-L-16010101-030 | Whitney Reservoir | 2 | 2 | FS | FS | FS | FS | | No | | Y | FS | FS | FS | FS | FS |
| UT-L-16010101-001 | Woodruff Creek Reservoir | 2 | 2 | FS | FS | FS | FS | | | | Y | FS | FS | FS | FS | FS |

## Assessment Results for Bear River Watershed Lake Assessment Units

| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010 | | | | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DO | pH | T | Other | | | | 2002 | 2004 | 2006 | 2008 | 2010 |

**Notes:**

FS Fully Supporting

NS Not Supporting

Y Yes

N No

DO Dissolved Oxygen

FK Fish Kill

T Temperature

Total P Total Phosphorus

NA Not Analyzed

TDS Total Dissolved Solids

**Table 4-5 Individual Lake and Reservoir 2010 Trophic State Index (TSI)**

| Individual Lake and Reservoir 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Bear River | UT-L-16010201-003 | Bear Lake | 9/9/2008 | 33 | -15 | 37 |
| Bear River | UT-L-16010101-002 | Birch Creek Reservoir #2 | 8/23/2007 | 42 | 15 | 37 |
| Bear River | UT-L-16010101-002 | Birch Creek Reservoir #2 | 9/3/2008 | 65 | 78 | 62 |
| Bear River | UT-L-16010202-002 | Cutler Reservoir | 7/18/2007 | 70 | 62 | 72 |
| Bear River | UT-L-16010203-005 | Hyrum Reservoir | 7/18/2007 | 52 | 43 | 37 |
| Bear River | UT-L-16010203-005 | Hyrum Reservoir | 9/8/2008 | 53 | 46 | 37 |
| Bear River | UT-L-16010101-007 | Little Creek Reservoir | 9/2/2008 | 52 | 44 | 66 |
| Bear River | UT-L-16010204-033 | Mantua Reservoir | 7/23/2007 | 38 | 41 | 37 |
| Bear River | UT-L-16010204-033 | Mantua Reservoir | 9/15/2008 | 37 | 45 | 37 |
| Bear River | UT-L-16010202-013 | Newton Reservoir | 9/8/2008 | 61 | 63 | 62 |

| Individual Lake and Reservoir 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Bear River | UT-L-16010203-009 | Porcupine Reservoir | 7/17/2007 | 31 | | 37 |
| Bear River | UT-L-16010203-009 | Porcupine Reservoir | 9/10/2008 | 41 | 40 | 37 |
| Bear River | UT-L-16010203-012 | Tony Grove Reservoir | 6/5/2007 | 44 | 30 | 37 |
| Bear River | UT-L-16010203-012 | Tony Grove Reservoir | 7/19/2007 | | 32 | 37 |
| Bear River | UT-L-16010203-012 | Tony Grove Reservoir | 8/14/2007 | 40 | 32 | 37 |
| Bear River | UT-L-16010203-012 | Tony Grove Reservoir | 8/21/2007 | | 35 | 37 |
| Bear River | UT-L-16010203-012 | Tony Grove Reservoir | 9/25/2007 | 32 | 39 | 37 |
| Bear River | UT-L-16010203-012 | Tony Grove Reservoir | 10/23/2007 | 37 | 37 | 37 |
| Bear River | UT-L-16010203-012 | Tony Grove Reservoir | 9/9/2008 | 32 | 35 | 37 |
| Bear River | UT-L-16010101-030 | Whitney Reservoir | 9/16/2008 | 43 | 46 | 37 |
| Bear River | UT-L-16010101-001 | Woodruff Creek Reservoir | 9/3/2008 | 43 | 50 | 37 |

**Table 4-6 Summary of Individual Lake and Reservoir Trophic State Index (TSI)**

| Summary of Individual Lake and Reservoir Support for Bear River Watershed Management Unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16010201-003 | Bear Lake | 2 | 2 | | FS | FS | FS | | No | | N | FS | FS | FS | FS | FS |
| UT-L-16010101-002 | Birch Creek Reservoir #2 | 2 | 2 | | FS | FS | FS | | P | | N | FS | NS | NS | FS | NS |
| UT-L-16010202-002 | Cutler Reservoir | 5 | 5 | | FS | FS | FS | | TP, TSI | | ND | NS | FS | FS | NS | FS |

| Summary of Individual Lake and Reservoir Support for Bear River Watershed Management Unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16010203-005 | Hyrum Reservoir | 4A | 5 | DO | NS | FS | NS | | No | | N | NS | NS | NS | FS | NS |
| UT-L-16010101-007 | Little Creek Reservoir | 3B | 2 | pH | FS | FS | FS | | TP | | Y | FS | FS | FS | NS | FS |
| UT-L-16010204-033 | Mantua Reservoir | 4 | 5 | pH, T | FS | NS | NS | | No | | Y | NS | NS | NS | NS | NS |
| UT-L-16010202-013 | Newton Reservoir | 4 | 4 | DO | FS | FS | FS | | TP, TSI | | Y | NS | NS | NS | NS | FS |

| Summary of Individual Lake and Reservoir Support for Bear River Watershed Management Unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16010203-009 | Porcupine Reservoir | 2 | 5 | | FS | NS | FS | | No | | N | NS | NS | FS | FS | NS |
| UT-L-16010203-012 | Tony Grove Lake | 5 | 5 | DO, pH | FS | FS | NS | | No | FK | Y | NS | NS | NS | NS | NS |
| UT-L-16010101-030 | Whitney Reservoir | 2 | 2 | FS | FS | FS | FS | | No | | Y | FS | FS | FS | FS | FS |
| UT-L-16010101-001 | Woodruff Creek Reservoir | 2 | 2 | FS | FS | FS | FS | | | | Y | FS | FS | FS | FS | FS |

| Summary of Individual Lake and Reservoir Support for Bear River Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |

**Notes:**

FS Fully Supporting

NS Not Supporting

Y Yes

N No

DO Dissolved Oxygen

FK Fish Kill

T Temperature

Total P Total Phosphorus

NA Not Analyzed

TDS Total Dissolved Solids

# FIGURES

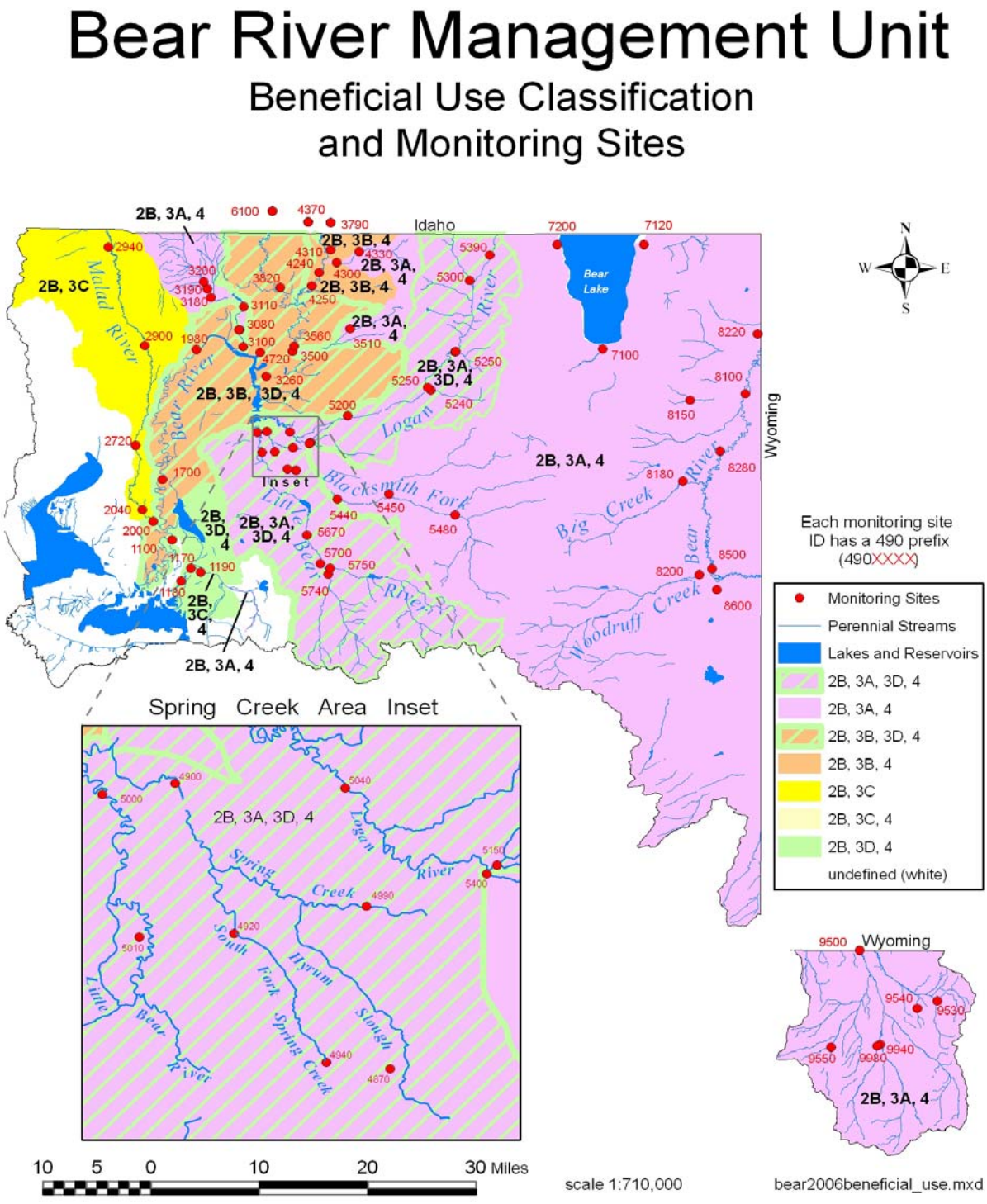


**Figure 4-1 Beneficial Use Classes for Bear River Watershed Management Unit**

# CHAPTER 5: WEBER RIVER WATERSHED MANAGEMENT UNIT ASSESSMENT

## 5.1 INTRODUCTION

The Weber River rises in Summit County near Reids Peak (11,708 ft), then flows west to Oakley, Utah; then turns and flows in a north westerly direction to the Great Salt Lake (4,200 ft). The Weber River is approximately 125 miles long: ~70 miles in Summit County, ~25 miles flow in Morgan County and ~30 miles in Weber County. The Ogden River, the largest tributary to the Weber River, lies within Weber County and enters the Weber River about 12 miles upstream from its mouth. The other major tributaries to the Weber River are East Canyon Creek, Lost Creek, Chalk Creek, and Beaver Creek. Two smaller tributaries that can affect the water quality of the Weber River are Echo Creek and Silver Creek. The Weber River Basin USGS Hydrological Units (HUCs) are listed in Table 5-1.

Biological, water chemistry and field data collected from January 1, 2004 through December 31, 2008 were used to make assessments. Water quality data were compared against standards established for each of the designated beneficial uses. The beneficial use classifications for the Weber River basin are shown in Figure 5-1.

## 5.2 IMPAIRED WATERS

The list of streams and lakes impaired and requiring a TMDL (Category 5; Section 303d) for the Weber River Unit are presented in Table 5-2. New listings for 2010 include Silver Creek, Echo Reservoir, and Rockport Reservoir. None of the streams or lakes on the Section 303d list are now meeting the standards or have an approved TMDL for this cycle. Assessment results for stream AUs within the Weber Management Unit are presented in Table 5-3, whereas Table 5-4 depicts assessment results for lakes. Additional detail about lake assessments is provided in Section 5.3.

## 5.3 LAKE ASSESSMENTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends. Assessment results for all of the reservoirs evaluated within the Weber Management Unit can be found in Table 5-4.

Table 5-5 shows TSIs based on each sample collected from May through September by sample date. Table 5-6 contains a summary of lake trophic status by study periods. Note that some of the changes in TSIs between assessment periods is due to the variability in the lakes and reservoirs and some is due to switching methodologies between 2008 and 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). Table 5-6 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. Small differences were observed for Rockport Reservoir. Moderate differences were observed for East Canyon Reservoir. Large differences were observed for Lost Creek Reservoir and Willard Bay Reservoir.

Lost Creek Reservoir is oligotrophic whether using the old or 2010 TSI method. The results for this cycle appear to be anomalous. 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). If the negative heterograde curve was caused by bacteria, the carbon source is likely allochthonous because of the oligotrophic trophic status.

Willard Bay changed from eutrophic in the 2008 IR to oligotrophic in 2010 with TSIs of 57 and 21, respectively. Using the old method for calculating the TSI, the reservoir would have been reported as mesotrophic for 2010 with a TSI of 48. This suggests that Willard Bay had an actual reduction in trophic status that was exaggerated by the change in TSI reporting methods. Total phosphorus was 0.03 µg/L, which is a concentration that exceeds the water quality indicator. As shown in Table 5-5, the difference in TSI-SD, TSI-TP, and TSI-Chla suggest that the phosphorus may be attached to particulates and not readily bioavailable. These particulates may be responsible for the elevated TSI-SD.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. Consistent trends that resulted in a net TSI change of five or changes greater than 10 between 2008 and 2010, which are not attributable to the change in TSI methodology alone, are identified. East Canyon Reservoir appears to have a decreasing trend in TSI scores. No visible trends—positive or negative—were apparent for other reservoirs in this watershed.

## 5.4 HEALTH ADVISORIES

Weber River-6 has a fish consumption advisory for mercury.

# TABLES

**Table 5-1 USGS Hydrological Units in the Weber River Watershed Management Unit**

| USGS Hydrological Units in the Weber River Watershed Management Unit. | |
|---|---|
| **Hydrological Unit Code** | **Hydrological Unit Name** |
| 16020101 | Upper Weber |
| 16020102 | Lower Weber |

**Table 5-2 Impaired Streams and Lakes Requiring a TMDL for the Weber River Watershed**

| Impaired Streams and Lakes Requiring a TMDL for the Weber River Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020101-004_00 | Weber River-7 | RIVER | 10.572 MILES | Weber River segment between confluence of Lost Creek and Echo Reservoir |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Phosphorus (Total) | 2008 | Low Priority | Cold Water Aquatic Life | • Agriculture<br>• Hydromodification |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020101-015_00 | East Fork Chalk Creek | RIVER | 28.424 MILES | East Fork Chalk Creek and tributaries from confluence with Chalk Creek to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |

| Impaired Streams and Lakes Requiring a TMDL for the Weber River Watershed | | | | |
|---|---|---|---|---|
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020101-020_00 | Silver Creek | RIVER | 21.367 MILES | Silver Creek and tributaries from confluence with Weber River to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Arsenic<br><br>Total Dissolved Solids | 2006<br><br>2010 | Medium Priority<br><br>Medium Priority | Domestic Water Supply<br><br>Agricultural<br><br>Cold Water Aquatic Life | • Resource Extraction<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL for the Weber River Watershed | | | | |
|---|---|---|---|---|
| UT16020102-001_00 | Weber River-1 | RIVER | 60.151 MILES | Weber River and tributaries from Great Salt Lake to Slaterville Diversion |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Non-Game Fish and Other Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020102-002_00 | Weber River-3 | RIVER | 17.86 MILES | Weber River from Ogden River confluence to Cottonwood Creek confluence |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL for the Weber River Watershed | | | | |
|---|---|---|---|---|
| UT16020102-005_00 | Ogden River-1 | RIVER | 9.656 MILES | Ogden River from confluence with Weber River to Pineview Reservoir |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020102-022_00 | Weber River-6 | RIVER | 12.37 MILES | Weber River between East Canyon Creek confluence and Lost Creek confluence |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL for the Weber River Watershed | | | | |
|---|---|---|---|---|
| UT16020102-027_00 | Kimball Creek | RIVER | 12.971 MILES | Kimball Creek and tributaries from East Canyon Creek confluence to headwaters, including McLeod Creek |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16020101-001_00 | Echo Reservoir | FRESHWATER LAKE | 1394 ACRES | LL= 405700/1112419 2N,3N 5E 29,30,31,32,5,8,17 USGS MAP AND DATE: COALVILLE, UTAH 1967 WATERSHED: WEBER RIVER |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | High Priority | Cold Water Aquatic Life | • Animal Feeding |

| Impaired Streams and Lakes Requiring a TMDL for the Weber River Watershed | | | | |
|---|---|---|---|---|
| | | | | Operations (NPS)<br><br>• Combined Sewer Overflows<br><br>• Irrigated Crop Production<br><br>• Managed Pasture Grazing<br><br>• Mine Tailings<br><br>• Municipal Point Source Discharges<br><br>• Other Recreational Pollution Sources<br><br>• Rangeland Grazing<br><br>• Septage Disposal<br><br>• Site Clearance (Land Development or Redevelopment)<br><br>• Unspecified Urban Stormwater |
| Temperature, water | 2010 | High Priority | Cold Water Aquatic Life | |
| Phosphorus (Total) | 1994 | High Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL for the Weber River Watershed | | | | |
|---|---|---|---|---|
| UT-L-16020101-002_00 | Rockport Reservoir | FRESHWATER LAKE | 1189 ACRES | LL= 404364/1112343 1N,1S 5E 28,29,33,32,4,5,9,10 USGS MAP AND DATE: WANSHIP, UTAH-1967 WATERSHED: WEBER RIVER |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved<br><br>Temperature, water | 2006<br><br>2010 | Low Priority<br><br>Low Priority | Cold Water Aquatic Life<br><br>Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16020102-014_00 | Pineview Reservoir | FRESHWATER RESERVOIR | 2874 ACRES | LL= 411600/1114828 6N 1,2E 1-3,7,10-16,18,19 USGS MAP AND DATE: HUNTSVILLE,1975 WATERSHED: OGDEN RIVER, WMU Weber River |

| Impaired Streams and Lakes Requiring a TMDL for the Weber River Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 1994 | Low Priority | Cold Water Aquatic Life | |

**Table 5-3 Assessment Results for Weber River Watershed Streams**

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-001_00 | Lost Creek | | RIVER | 29.892 MILES | Lost Creek and tributaries from confluence with Weber River to Lost Creek Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-002_00 | Francis Creek | | RIVER | 5.879 MILES | Francis Creek and tributaries from Lost Creek Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-003_00 | Lost Creek-2 | | RIVER | 47.634 MILES | Lost Creek and tributaries from Lost Creek Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-004_00 | Weber River-7 | | RIVER | 10.572 MILES | Weber River segment between confluence of Lost Creek and Echo Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total) | 2008 | Low Priority | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-005_00 | Main Canyon | | RIVER | 9.505 MILES | Main Canyon Creek and other tributaries to Weber River | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-006_00 | Upper Weber Tribs-1 | | RIVER | 0.01 MILES | Weber River east side tributaries from Lost Creek confluence to Echo Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-007 | Echo Creek | | RIVER | 41.55 MILES | Echo Creek and tributaries, except Echo Creek and tributaries, except Sawmill Creek, from confluence with Weber River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Sedimentation/Siltation | 2006 | Completed | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-008_00 | Carruth Creek | | RIVER | 7.7 MILES | Carruth and Lewis Canyon Creeks and tributaries from confluence with Echo Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-009_00 | Grass Creek | | RIVER | 8.221 MILES | Grass Creek and tributaries from confluence with Echo Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-010_00 | Chalk Creek-1 | | RIVER | 7.671 MILES | Chalk Creek and tributaries from confluence with Weber River to South Fork confluence | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Habitat Modification - other than Hydromodification<br>• Resource Extraction<br>• Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br><br>2006 | Completed<br>Pollution<br>Completed | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
|---|---|---|---|---|
| UT16020101-011_00 | South Fork Chalk Creek | RIVER | 47.402 MILES | South Fork Chalk Creek and tributaries from confluence with Chalk Creek to headwaters |

| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
|---|---|---|---|---|---|---|

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | • Natural Sources<br>• Agriculture |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br><br>2006 | Completed<br>Pollution<br>Completed | • Habitat Modification - other than Hydromodification<br>• Hydromodification |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-012_00 | Chalk Creek-2 | | RIVER | 4.489 MILES | Chalk Creek and tributaries from South Fork confluence to Huff Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total) | 2006 | Completed | • Habitat Modification - other than Hydromodification |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply<br>Secondary Recreation | Fully Supporting<br>Not Assessed | N<br>N | Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006 | Pollution<br>Completed | • Resource Extraction<br>• Hydromodification<br>• Natural Sources |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-013_00 | Huff Creek | | RIVER | 16.387 MILES | Huff Creek and tributaries from confluence with Chalk Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural<br>Cold Water Aquatic Life<br>Domestic Water Supply | Fully Supporting<br>Not Supporting<br>Fully Supporting | N<br>N<br>N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br>2006 | Completed<br>Pollution<br>Completed | • Natural Sources<br>• Agriculture<br>• Habitat Modification - other than Hydromodification<br>• Resource Extraction<br>• Hydromodification |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-014_00 | Chalk Creek-3 | | RIVER | 13.73 MILES | Chalk Creek and tributaries from Huff Creek confluence to East Fork confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Natural Sources<br>• Agriculture |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br><br>2006 | Completed<br>Pollution<br>Completed | • Habitat Modification - other than Hydromodification<br>• Hydromodification |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-015_00 | East Fork Chalk Creek | | RIVER | 28.424 MILES | East Fork Chalk Creek and tributaries from confluence with Chalk Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-016_00 | Chalk Creek-4 | | RIVER | 47.292 MILES | Chalk Creek and tributaries from East Fork Chalk Creek confluence to headwaters | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Natural Sources<br>• Habitat Modification - other than Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br><br>2006 | Completed<br>Pollution<br>Completed | • Resource Extraction<br>• Hydromodification |
| Domestic Water Supply | Fully Supporting | N | | | | • Agriculture |
| Secondary Recreation | Not Assessed | N | | | | |

| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
|---|---|---|---|---|
| UT16020101-017_00 | Weber River-8 | RIVER | 10.671 MILES | Weber River from Echo Reservoir to Rockport Reservoir |

| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-018_00 | Upper Weber Tribs-2 | | RIVER | 0.01 MILES | Weber River west side tributaries between Echo Reservoir and Silver Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-019_00 | Upper Weber Tribs-3 | | RIVER | 19.146 MILES | Weber River east side tributaries between Echo Reservoir and Fort Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020101-020_00 | Silver Creek | | RIVER | 21.367 MILES | Silver Creek and tributaries from confluence with Weber River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Cadmium<br>Total Dissolved Solids | 1994<br>2010 | Completed<br>Medium Priority | • Resource Extraction<br>• Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Cadmium<br>Total Dissolved Solids<br>Zinc | 1994<br>2010<br>1994 | Completed<br>Medium Priority<br>Completed | |
| Domestic Water Supply | Not Supporting | N | Arsenic | 2006 | Medium Priority | |
| Primary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-021_00 | Upper Weber Tribs-4 | | RIVER | 6.861 MILES | Weber River west side tributaries between Silver Creek confluence and Beaver Creek confluence | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-022_00 | Fort Creek | | RIVER | 9.579 MILES | Fort Creek and tributaries from confluence with Weber River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-023_00 | Weber River-9 | | RIVER | 19.023 MILES | Weber River from Rockport Reservoir to Weber-Provo Canal | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-024_00 | Weber River-10 | | RIVER | 45.578 MILES | Weber River and tributaries from Provo Canal Diversion to Smith-Morehouse confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020101-025_00 | Weber River-11 | | RIVER | 30.253 MILES | Weber River and tributaries from Smith Morehouse confluence to Holiday Park | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-026_00 | Smith Morehouse River-1 | | RIVER | 8.392 MILES | Smith Morehouse River from confluence with Weber River to Smith Morehouse Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-027_00 | Smith Morehouse River-2 | | RIVER | 14.508 MILES | Smith Morehouse River and tributaries from Smith Morehouse Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-028_00 | Weber River-12 | | RIVER | 26.146 MILES | Weber River and tributaries from Holiday Park to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-029_00 | Beaver Creek-1 | | RIVER | 12.717 MILES | Beaver Creek and tributaries from confluence with Weber River to Kamas | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-030_00 | Beaver Creek-2 | | RIVER | 21.437 MILES | Beaver Creek and tributaries from Kamas to headwaters | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020101-031 | Sawmill Creek | | RIVER | 2.6 MILES | Echo Creek and tributaries from Sawmill Creek and tributaries from confluence with Echo Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-001_00 | Weber River-1 | | RIVER | 60.151 MILES | Weber River and tributaries from Great Salt Lake to Slaterville Diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Non-Game Fish and Other Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Wildlife Habitat | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-002_00 | Weber River-3 | | RIVER | 17.86 MILES | Weber River from Ogden River confluence to Cottonwood Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-003_00 | Four Mile Creek | | RIVER | 7.803 MILES | Fourmile Creek and tributaries from confluence with Weber River | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-004_00 | Burch Creek-2 | | RIVER | 3.632 MILES | Burch Creek and tributaries from Harrison Blvd to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-005_00 | Ogden River-1 | | RIVER | 9.656 MILES | Ogden River from confluence with Weber River to Pineview Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020102-006_00 | North Fork Ogden River | | RIVER | 34.797 MILES | North Fork Ogden River and tributaries from Pineview Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-007_00 | Weber River-2 | | RIVER | 0.396 MILES | Weber River from Slaterville Diversion to Ogden River confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-008_00 | Wheeler Creek | | RIVER | 12.982 MILES | Wheeler Creek and tributaries from confluence with Ogden River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-009_00 | Middle Fork Ogden River | | RIVER | 22.674 MILES | Middle Fork Ogden River and tributaries from Pineview Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020102-010_00 | South Fork Ogden River-1 | | RIVER | 15.56 MILES | South Fork Ogden River and tributaries from Pineview Reservoir to Causey Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-011_00 | Beaver Creek | | RIVER | 18.485 MILES | Beaver Creek and tributaries from South Fork Ogden River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-012_00 | South Fork Ogden River | | RIVER | 32.726 MILES | South Fork Ogden River and tributaries from Causey Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-013_00 | Strong Canyons Creek | | RIVER | 1.307 MILES | Strongs Canyon Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-014_00 | Burch Creek-1 | | RIVER | 3.388 MILES | Burch Creek and tributaries from confluence with Weber River to Harrison Blvd | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-015_00 | Spring Creek | | RIVER | 2.343 MILES | Spring Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-016_00 | Lower Weber Tribs-2 | | RIVER | 0.01 MILES | Weber River south side tributaries from mouth of Weber Canyon to Cottonwood Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-017_00 | Lower Weber Tribs-1 | | RIVER | 24.622 MILES | Weber River north side tributaries from Ogden River confluence to Cottonwood Creek confluence, excluding defined tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-018_00 | Cottonwood Creek | | RIVER | 7.686 MILES | Cottonwood Creek and tributaries from confluence with Weber | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-019_00 | Lower Weber Tribs-4 | | RIVER | 2.932 MILES | Weber River east side tributaries from Cottonwood Creek to Stoddard Diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-020_00 | Weber River-4 | | RIVER | 9.502 MILES | Weber River from Cottonwood Creek confluence to Stoddard Diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020102-021_00 | Lower Weber Tribs-3 | | RIVER | 22.623 MILES | Weber River west side tributaries from Cottonwood Creek to Stoddard Diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-022_00 | Weber River-6 | | RIVER | 12.37 MILES | Weber River between East Canyon Creek confluence and Lost Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-023_00 | Hardscrabble Creek | | RIVER | 23.485 MILES | Hardscrabble Creek and tributaries from confluence with East Canyon Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-024_00 | East Canyon Creek -1 | | RIVER | 15.265 MILES | East Canyon Creek from confluence with Weber River to East Canyon Dam | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020102-025_00 | East Canyon Creek-3 | | RIVER | 3.045 MILES | East Canyon Reservoir tributaries other than East Canyon Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-026_00 | East Canyon Creek-2 | | RIVER | 34.66 MILES | East Canyon Creek and tributaries from East Canyon Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | • Municipal Point Source Discharges<br>• Site Clearance (Land Development or Redevelopment) |
| Cold Water Aquatic Life | Not Supporting | N | Oxygen, Dissolved<br>Phosphorus (Total) | 2006<br>1992 | Completed<br>Completed | • Agriculture<br>• Urban Runoff/Storm Sewers |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-027_00 | Kimball Creek | | RIVER | 12.971 MILES | Kimball Creek and tributaries from East Canyon Creek confluence to headwaters, including McLeod Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-028_00 | Lower Weber River Tribs-7 | | RIVER | 0.01 MILES | Weber River north side tributaries between East Canyon Creek and Lost Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-029_00 | Lower Weber River Tribs-8 | | RIVER | 0.386 MILES | Weber River south side tributaries between East Canyon Creek and Lost Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-030_00 | North Fork Kays Creek | | RIVER | 0.687 MILES | North Fork Kays Creek and tributaries from USFS boundary to headwaters | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-031_00 | Kays Creek | | RIVER | 10.83 MILES | Kays Creek and tributaries from Farmington Bay to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-032_00 | South and Middle Fork Kays Creek | | RIVER | 1.948 MILES | Kays Creek South Fork and Middle Fork and their tributaries from USFS Boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020102-033_00 | Snow Creek | | RIVER | 0.01 MILES | Snow Creek and tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Non-Game Fish and Other Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-034_00 | Holmes Creek-2 | | RIVER | 0.01 MILES | Holmes Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-035_00 | Holmes Creek-1 | | RIVER | 0.01 MILES | Holmes Creek and tributaries from Farmington Bay to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020102-036_00 | Baer Creek-3 | | RIVER | 2.883 MILES | Baer Creek and tributaries from US 89 to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-037_00 | Shepard Creek | | RIVER | 0.01 MILES | Sheppard Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-038_00 | Farmington Creek-2 | | RIVER | 6.143 MILES | Farmington Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-039_00 | Farmington Creek-1 | | RIVER | 0.01 MILES | Farmington Creek and tributaries from Farmington Bay to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020102-040_00 | Steed Creek | | RIVER | 0.01 MILES | Steed Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-041_00 | Davis Creek | | RIVER | 0.01 MILES | Davis and Lone Pine Creeks and tributaries from US 89 to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-042_00 | Ricks Creek | | RIVER | 2.162 MILES | Ricks Creek and tributaries from Interstate 15 to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-043_00 | Barnard Creek | | RIVER | 0.01 MILES | Barnard Creek and tributaries from US 89 to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-044_00 | Parrish Creek | | RIVER | 3.737 MILES | Parrish and Duel Creeks and their tributaries from Davis Aqueduct to headwaters | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-045_00 | Stone Creek-2 | | RIVER | 2.641 MILES | Stone Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-046_00 | Stone Creek-1 | | RIVER | 0.363 MILES | Stone Creek from Great Salt Lake to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020102-047_00 | Barton Creek | | RIVER | 2.56 MILES | Barton Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-048_00 | Weber River-5 | | RIVER | 1.505 MILES | Weber River from Stoddard Diversion to East Canyon Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-049_00 | Mill Creek-2 | | RIVER | 5.335 MILES | Mill Creek and tributaries from Mueller Park at USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-050_00 | Milll Creek-1 | | RIVER | 0.01 MILES | Mill Creek from Great Salt Lake to Mueller Park at USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-051_00 | Baer Creek-2 | | RIVER | 0.01 MILES | Baer Creek and tributaries from Interstate 15 to US 89 | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-052_00 | Rudd Creek | | RIVER | 0.01 MILES | Rudd Creek and tributaries from Davis Aqueduct to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-053_00 | Baer Creek-1 | | RIVER | 0.01 MILES | Baer Creek and tributaries from Farmington Bay to Interstate 15 | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Non-Game Fish and Other Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-054_00 | Lower Weber Tribs-6 | | RIVER | 0.01 MILES | Weber River east side tributaries from Stoddard Diversion to East Canyon Creek | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-055_00 | Lower Weber Tribs-5 | | RIVER | 24.875 MILES | Weber River west side tributaries from Stoddard Diversion to East Canyon Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-056_00 | Corbett Creek | | RIVER | 0.01 MILES | Corbett Creek and tributaries from U.S. Highway 89 to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Weber River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020102-058_00 | North Canyon | | RIVER | 0.01 MILES | North Canyon Creek and tributaries from USFS boundary to headwates. | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

**Table 5-4 Assessment Results for Weber River Watershed Lakes**

| Assessment Results for Weber River Watershed Lakes | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Parameters Not Supporting 2010 | | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16020102-021 | Causey Reservoir | 2 | 2 | | FS | FS | FS | | No | | N | FS | FS | FS | FS | FS |
| UT-L-16020102-020 | East Canyon Reservoir | 4 | 4 | DO | NS | FS | FS | | No | | Y | NS | FS | NS | NS | NS |
| UT-L-16020101-001 | Echo Reservoir | 5 | 5, 3B | DO | NS | NS | FS | | No | | Y | NS | FS | FS | NS | NS |
| UT-L-16020101-003 | Lost Creek Reservoir | 2 | 3B | | NS | NS | FS | | No | | N | FS | FS | FS | FS | NS |

**Assessment Results for Weber River Watershed Lakes**

| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16020102-014 | Pineview Reservoir | 4 | 4, 3B | DO | NS | FS | NS | | No | | Y | NS | NS | NS | NS | NS |
| UT-L-16020101-002 | Rockport Reservoir | 5 | 5, 3B | DO | NS | NS | FS | | No | | Y | FS | FS | NS | NS | NS |
| UT-L-16020101-005 | Smith and Morehouse Reservoir | 2 | 2 | FS | FS | FS | FS | | No | | N | FS | FS | FS | FS | FS |
| UT-L-16020102-004 | Willard Bay Reservoir | 2 | 2 | FS | FS | FS | FS | | TP | | Y | FS | FS | FS | FS | FS |

## Assessment Results for Weber River Watershed Lakes

| | | | | Parameters Not Supporting 2010 | | | | | | | | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |

**Notes:**

FS Fully Supporting

NS Not Supporting

Y Yes

N No

DO Dissolved Oxygen

FK Fish Kill

T Temperature

Total P Total Phosphorus

NA Not Analyzed

Table 5-5 Individual Lake 2010 Trophic State Index (TSI)

| Individual Lake 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Weber River | UT-L-16020102-021 | Causey Reservoir | 8/27/2008 | 46 | 42 | 37 |
| Weber River | UT-L-16020102-020 | East Canyon Reservoir | 6/19/2007 | 37 | 36 | 35 |
| Weber River | UT-L-16020102-020 | East Canyon Reservoir | 6/19/2007 | 35 | 37 | 37 |
| Weber River | UT-L-16020102-020 | East Canyon Reservoir | 7/10/2007 | 39 | 36 | 37 |
| Weber River | UT-L-16020102-020 | East Canyon Reservoir | 8/15/2007 | 42 | 30 | 37 |
| Weber River | UT-L-16020102-020 | East Canyon Reservoir | 9/12/2007 | 37 | 34 | 48 |

| Individual Lake 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Weber River | UT-L-16020102-020 | East Canyon Reservoir | 8/18/2008 | 42 | -15 | 37 |
| Weber River | UT-L-16020101-001 | Echo Reservoir | 6/19/2007 | 37 | 33 | 35 |
| Weber River | UT-L-16020101-003 | Lost Creek Reservoir | 7/18/2007 | 37 | -15 | 42 |
| Weber River | UT-L-16020102-014 | Pineview Reservoir | 7/23/2007 | 37 | 44 | 54 |
| Weber River | UT-L-16020101-002 | Rockport Reservoir | 8/7/2007 | 37 | | |
| Weber River | UT-L-16020101-005 | Smith and Morehouse Reservoir | 9/15/2008 | 46 | 40 | 37 |

| Individual Lake 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Weber River | UT-L-16020102-004 | Willard Bay | 7/18/2007 | 53 | 21 | 70 |

Notes:

TSI-SD = Trophic State Index from secchi disk

TSI-Chla = Trophic State Index from chlorophyll-a

TSI-TP = Trophic State Index from total phosphorus

**Table 5-6 Summary of Individual Lake Trophic State Index (TSI)**

| Summary of Individual Lake Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Weber River | UT-L-16020102-021 | Causey Reservoir | 43 | 39 | 43 | 38 | 34 | NA | NA | NA | 42 | 42 | M | M |
| Weber River | UT-L-16020102-020 | East Canyon Reservoir | 49 | 53 | 50 | 48 | 44 | 46 | 46 | 43 | 35 | 26 | O | O |
| Weber River | UT-L-16020101-001 | Echo Reservoir | | 39 | 42 | 45 | 39 | 51 | 51 | 46 | 35 | 33 | O | O |
| Weber River | UT-L-16020101-003 | Lost Creek Reservoir | 40 | 46 | 35 | 39 | 37 | 30 | 37 | NA | 21 | -15 | O | O |
| Weber River | UT-L-16020102-014 | Pineview Reservoir | | 58 | 40 | 43 | 47 | 41 | 52 | 52 | 45 | 44 | M | M |

| Summary of Individual Lake Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Weber River | UT-L-16020101-002 | Rockport Reservoir | 44 | 43 | 42 | 45 | 41 | 31 | 48 | 64 | 37 | 37 | O | O |
| Weber River | UT-L-16020101-005 | Smith and Morehouse Reservoir | 44 | 46 | 34 | 37 | 38 | 40 | 43 | 40 | 41 | 40 | M | M |
| Weber River | UT-L-16020102-004 | Willard Reservoir | | 63 | 48 | 53 | 47 | 46 | 56 | 57 | 48 | 21 | M | O |

| Summary of Individual Lake Trophic State Index (TSI) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |

Notes:

2010 Old Method TSI calculated using the 2008 Integrated Report Methodology

2010 Current Method TSI calculated using the 2010 Integrated Report Methodology of only chlorophyll-a

O = Oligotrophic

M = Mesotrophic

E = Eutrophic

H = Hypereutrophic

# FIGURES

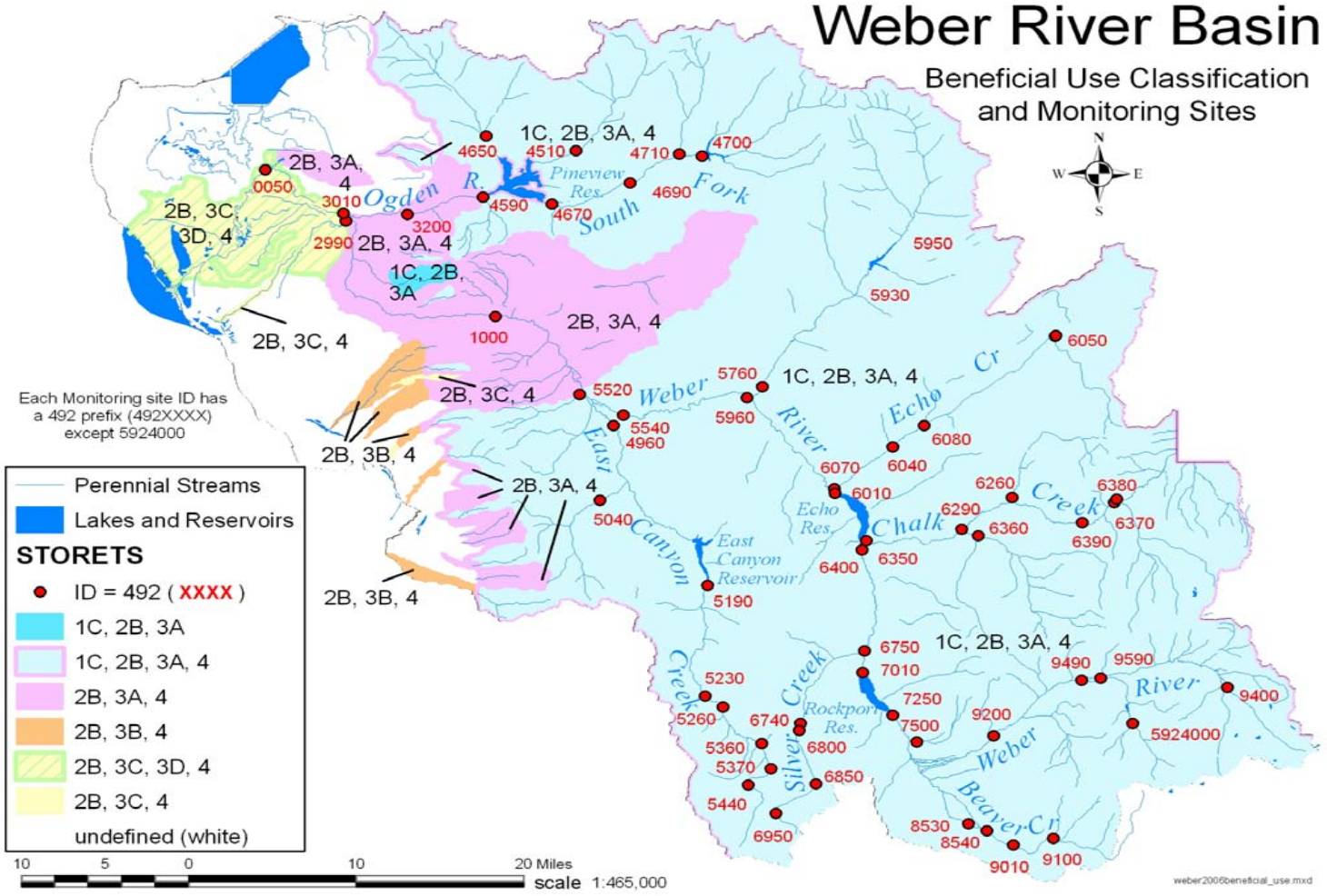


**Figure 5-1 Weber River Watershed Management Unit Beneficial Use Classifications**

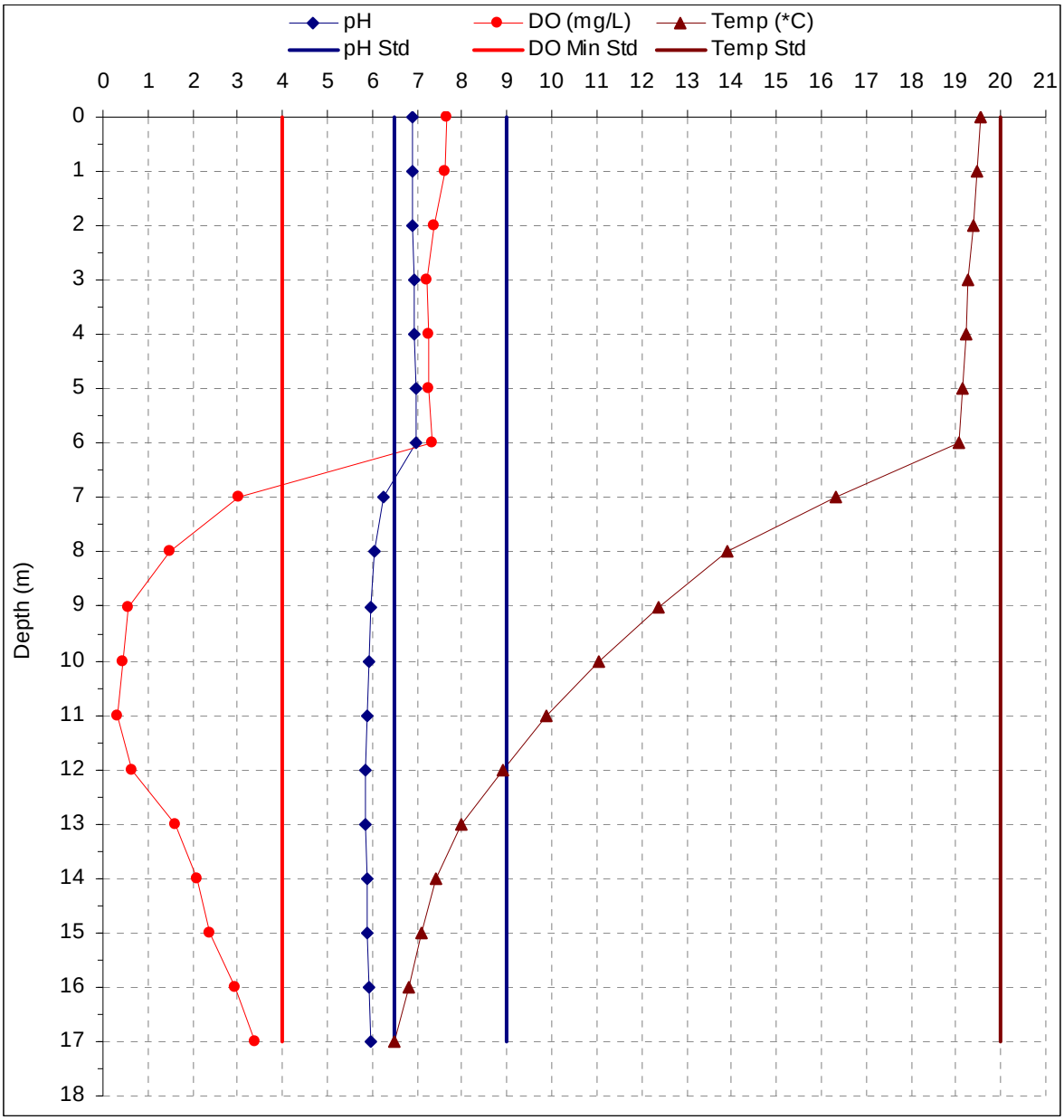


**Figure 5-2 Lost Creek Reservoir Profile Showing Negative Heterograde Curve**

**8/19/2008**

**Storet Site 4925910**

# CHAPTER 6: UTAH LAKE-JORDAN RIVER WATERSHED MANAGEMENT UNIT ASSESSMENT

## 6.1 INTRODUCTION

The Utah Lake-Jordan River Watershed Management Unit lies in north-central Utah and includes those streams that drain into Utah Lake and the Jordan River and its tributaries from Utah Lake to the Great Salt Lake. Utah Lake receives water from the Provo and Spanish Fork Rivers, and numerous tributaries that drain the Wasatch Mountains around it. In addition, the Duchesne Tunnel and Weber River diversions empty into the Provo River and a third diversion carries Strawberry Reservoir water into the lake via Diamond Fork and Spanish Fork Rivers. There are numerous streams that drain the Wasatch and Oquirrh Mountain ranges that flow into the Jordan River. Some of these streams are Little Cottonwood Creek, Big Cottonwood Creek, and Bingham Canyon Creek.

This management unit includes all streams located in the USGS Hydrological Units (HUCs) listed in Table 6-1 and is located in the north central part of the state.

Biological, water chemistry and field data collected from January 1, 2004 through December 31, 2008 were used to make assessments. Water quality data were compared against standards established for each of the designated beneficial uses. Figure 6-1 shows the beneficial use classes for this basin.

## 6.2 IMPAIRED WATERS

The list of streams and lakes impaired and requiring a TMDL (Category 5; Section 303d) for the Jordan River Watershed Management Unit are presented in Table 6-2. New listings for 2010 include Provo River-4, Main Creek-1, Provo Deer Creek, Snake Creek-1, Jordan River-1, Jordan River-4, City Creek-2, Mill Creek-2, Parley Canyon-1 and Utah Lake. None of the streams or lakes listed as impaired (Category 5) in the 2008 *Integrated Report* are now meeting the standards or have an approved TMDL for this cycle. Assessment results for all AUs for streams are presented in Table 4-3 and lakes in Table 4-4. Lake assessments are further discussed in the next section.

## 6.3 LAKE ASSESSMENTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends.

Table 6-5 shows TSIs based on each sample collected from May through September by sample date. Table 6-6 contains a summary of lake trophic status by study periods. Note that some of the changes in TSIs between assessment periods is due to the variability in the lakes and reservoirs and some is due to switching methodologies between 2008 and 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). Table 6-6 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. A large difference was observed for Trial Lake.

Trial Lake is classified oligotrophic whether using the old TSI method or the 2010 method. As shown in Table 6-5, a comparison of the TSI-SD, TSI-Chla, and TSI-TP suggests that light attenuation is dominated by nonalgal particulates or color. The pH measurements of less than 6.5 also support a low algal trophic status.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. Consistent trends that resulted in a net TSI change of five or changes greater than 10 between 2008 and 2010, which are not attributable to the change in TSI methodology alone, are identified. TSI trends are stable for the Jordan River Watershed lakes.

## 6.4 HEALTH ADVISORIES

Jordanelle Reservoir and Utah Lake have fish consumption advisories for mercury and PCBs, respectively.

# TABLES

**Table 6-1 USGS Hydrological Unit Codes and Names**

| USGS Hydrological Unit Codes and Names | |
|---|---|
| **Hydrological Unit Code** | **Hydrological Unit Name** |
| 16020201 | Utah Lake |
| 16020202 | Spanish Fork |
| 16020203 | Provo |
| 16020204 | Jordan |

**Table 6-2 Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed**

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020201-003_00 | Currant Creek | RIVER | 3.439 MILES | Current Creek from mouth of Goshen Canyon to Mona Reservoir |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| Temperature, water<br><br>pH | 2006<br><br>2006 | <br><br>High Priority | Cold Water Aquatic Life<br><br>Agricultural<br><br>Cold Water Aquatic Life<br><br>Secondary Recreation | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020202-019_00 | Clear Creek | RIVER | 12.63 MILES | Clear Creek and tributaries from confluence with Soldier Creek to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020202-022_00 | Thistle Creek-1 | RIVER | 18.28 MILES | Thistle Creek from confluence with Soldier Creek to confluence with Little Clear Creek |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020203-001_00 | Provo River-1 | RIVER | 10.262 MILES | Provo River from Utah Lake to Murdock Diversion |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020203-004_00 | Provo River-4 | RIVER | 9.54 MILES | Provo River from Deer Creek Reservoir to Jordanelle Reservoir |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Escherichia coli | 2010 | Low Priority | Domestic Water Supply<br><br>Secondary Recreation | • Livestock (Grazing or Feeding Operations)<br>• Natural |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| | | | | Sources<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020203-009_00 | Main Creek-1 | RIVER | 6.206 MILES | Main Creek and tributaries from Deer Creek Reservoir to Round Valley |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Escherichia coli<br><br>Temperature, water | 2010<br><br>2010 | Low Priority<br><br>Low Priority | Domestic Water Supply<br><br>Secondary Recreation<br><br>Cold Water Aquatic Life | • Source Unknown<br><br>• Natural Sources |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020203-013_00 | Provo Deer Creek | RIVER | 19.137 MILES | Provo Deer Creek and tributaries from confluence with Provo River to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| Benthic-Macroinvertebrate Bioassessments<br><br>Escherichia coli | 2008<br><br>2010 | Low Priority<br><br>Low Priority | Cold Water Aquatic Life<br><br>Domestic Water Supply<br><br>Secondary Recreation | • Source Unknown<br><br>• Natural Sources |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020203-014_00 | Snake Creek-1 | RIVER | 4.085 MILES | Snake Creek from confluence with Provo River to Wasatch Mountain State Park Golf Course |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Arsenic<br><br>Escherichia coli | 2006<br><br>2010 | Medium Priority<br><br>Medium Priority | Domestic Water Supply<br><br>Domestic Water Supply<br><br>Secondary Recreation | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-001_00 | Jordan River-1 | RIVER | 7.602 MILES | Jordan River from Farmington Bay upstream contiguous with the Davis County |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| | | | | line |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Escherichia coli<br><br>Oxygen, Dissolved | 2010<br><br>2006 | Medium Priority<br><br>High Priority | Secondary Recreation<br><br>Warm Water Aquatic Life<br><br>Wildlife Habitat | • Livestock (Grazing or Feeding Operations)<br>• Source Unknown<br>• Urban Runoff/Storm Sewers<br>• Industrial Point Source Discharge<br>• Municipal Point Source Discharges |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-002_00 | Jordan River-2 | RIVER | 4.456 MILES | Jordan River from Davis County line upstream to North Temple Street |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Escherichia coli<br><br>Oxygen, Dissolved | 2006<br><br>2006 | Medium Priority<br><br>High Priority | Secondary Recreation<br><br>Warm Water Aquatic Life | • Agriculture<br>• Natural Sources<br>• Urban |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| | | | | Runoff/Storm Sewers<br>• Industrial Point Source Discharge<br>• Municipal Point Source Discharges |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-003_00 | Jordan River-3 | RIVER | 4.197 MILES | Jordan River from North Temple to 2100 South |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Escherichia coli<br>Oxygen, Dissolved<br>Phosphorus (Total) | 2006<br>2008<br>2008 | Medium Priority<br>High Priority<br>High Priority | Secondary Recreation<br>Warm Water Aquatic Life<br>Warm Water Aquatic Life | • Agriculture<br>• Natural Sources<br>• Urban Runoff/Storm Sewers<br>• Industrial Point Source Discharge<br>• Municipal Point Source Discharges |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| UT16020204-004_00 | Jordan River-4 | RIVER | 9.406 MILES | Jordan River from 2100 South to the confluence with Little Cottonwood Creek |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments<br><br>Total Dissolved Solids | 2010<br><br>2008 | Low Priority<br><br>High Priority | Warm Water Aquatic Life<br><br>Agricultural | • Source Unknown<br>• Natural Sources<br>• Urban Runoff/Storm Sewers |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-005_00 | Jordan River-5 | RIVER | 1.629 MILES | Jordan River from the confluence with Little Cottonwood Creek to 7800 South |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Escherichia coli<br><br>Temperature, water | 2006<br><br>2006 | Medium Priority<br><br>High Priority | Secondary Recreation<br><br>Cold Water Aquatic Life | • Agriculture<br>• Natural Sources<br>• Urban Runoff/Storm |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| Total Dissolved Solids | 2006 | High Priority | Agricultural | Sewers<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-006_00 | Jordan River-6 | RIVER | 10.291 MILES | Jordan River from 7800 South to Bluffdale |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water<br><br>Total Dissolved Solids | 2006<br><br>2006 | High Priority<br><br>High Priority | Cold Water Aquatic Life<br><br>Agricultural | • Source Unknown<br><br>• Industrial Point Source Discharge<br>• Municipal Point Source Discharges<br>• Urban Runoff/Storm Sewers |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-007_00 | Jordan River-7 | RIVER | 4.175 MILES | Jordan River from Bluffdale to Narrows |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| Temperature, water | 2006 | High Priority | Cold Water Aquatic Life | • Source Unknown<br>• Industrial Point Source Discharge<br>• Municipal Point Source Discharges<br>• Natural Sources<br>• Urban Runoff/Storm Sewers |
| Total Dissolved Solids | 2006 | High Priority | Agricultural | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-008_00 | Jordan River-8 | RIVER | 14.15 MILES | Jordan River from Narrows to Utah Lake |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Total Dissolved Solids | 2006 | High Priority | Agricultural | • Industrial Point Source Discharge<br>• Municipal Point Source Discharges<br>• Natural Sources |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| UT16020204-010_00 | City Creek-2 | RIVER | 4.758 MILES | City Creek and tributaries from filtration plant to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Cadmium | 2010 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-012_00 | Emigration Creek | RIVER | 4.293 MILES | Emigration Creek and tributaries from Foothill BLVD to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Escherichia coli | 2008 | High Priority | Secondary Recreation | • Natural Sources<br>• On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)<br>• Urban Runoff/Storm Sewers |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| UT16020204-017_00 | Mill Creek-2 | RIVER | 7.364 MILES | Mill Creek and tributaries from Interstate 15 to USFS Boundary |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-019_00 | Big Cottonwood Creek-1 | RIVER | 9.525 MILES | Big Cottonwood Creek and tributaries from Jordan River to Big Cottonwood WTP |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2006 | Low Priority | Warm Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-021_00 | Little Cottonwood Creek-1 | RIVER | 8.734 MILES | Little Cottonwood Creek and tributaries from Jordan River confluence to Metropolitan WTP |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water<br><br>Total Dissolved Solids | 2006<br><br>2006 | Low Priority | Cold Water Aquatic Life<br><br>Agricultural | • Source Unknown<br><br>• Urban Runoff/Storm Sewers |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-022_00 | Little Cottonwood Creek-2 | RIVER | 21.489 MILES | Little Cottonwood Creek and tributaries from Metropolitan WTP to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16020204-025_00 | Parley Canyon Creek-1 | RIVER | 11.434 MILES | Parleys Canyon Creek and tributaries from 1300 East to Mountain Dell Reservoir |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| Escherichia coli | 2010 | Medium Priority | Domestic Water Supply<br><br>Secondary Recreation | • Natural Sources<br><br>• Wastes from Pets |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16020201-004_00 | Utah Lake | FRESHWATER LAKE | 96900 ACRES | LL= 401145/11147335,6,7,8,9S 1W,1,2,3E USGS MAP AND DATE: PELICAN POINT,1975 WATERSHED: JORDAN RIVER |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Total Dissolved Solids<br><br>Phosphorus (Total)<br><br>PCB in Fish Tissue | 2006<br><br>1994<br><br>2010 | Medium Priority<br><br>Medium Priority<br><br>Low Priority | Agricultural<br><br>Warm Water Aquatic Life<br><br>Warm Water Aquatic Life | • Highways, Roads, Bridges, Infrastructure (New Construction)<br><br>• Industrial Point Source Discharge<br><br>• Municipal Point Source Discharges<br><br>• Source Unknown<br><br>• Unspecified Urban Stormwater<br><br>• Animal Feeding |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| | | | | Operations (NPS)<br>• Irrigated Crop Production<br>• Managed Pasture Grazing |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16020202-002_00 | Big East Lake | FRESHWATER LAKE | 23 ACRES | LL= 395605/1113821 10S 3E 19 USGS MAP AND DATE: PAYSON LAKES, UTAH-1979 WATERSHED: PETEETNEET CREEK, WMU Jordan River/Utah Lake |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved<br>pH | 2006<br>2008 | High Priority<br>Low Priority | Cold Water Aquatic Life<br>Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16020203-004_00 | MILL HOLLOW RESERVOIR | FRESHWATER LAKE | 15 ACRES | LL= 403922/1105356 4S 7E 12 USGS MAP AND DATE: WOLF CREEK SUMMIT, UTAH-1967 WATERSHED: |

| Impaired Streams and Lakes Requiring a TMDL for the Jordan River Watershed | | | | |
|---|---|---|---|---|
| | | | | MILL HOLLOW, WMU Jordan River/Utah Lake |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| pH | 1992 | Low Priority | Cold Water Aquatic Life | • Grazing in Riparian or Shoreline Zones |
| Phosphorus (Total) | 1992 | Low Priority | Cold Water Aquatic Life | • Other Recreational Pollution Sources<br>• Rangeland Grazing |

**Table 6-3 Assessment Results for Jordan River Watershed Streams**

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020201-001_00 | American Fork River-1 | | RIVER | 14.15 MILES | American Fork River and tributaries from Diversion at mouth of Canyon to Tibble Fork Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020201-002_00 | American Fork River-2 | | RIVER | 30.809 MILES | American Fork River and tributaries from Tibble Fork Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020201-003_00 | Currant Creek | | RIVER | 3.439 MILES | Current Creek from mouth of Goshen Canyon to Mona Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | pH | 2006 | High Priority | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | pH<br>Temperature, water | 2006<br>2006 | High Priority | |
| Secondary Recreation | Not Supporting | N | pH | 2006 | High Priority | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020201-004_00 | Salt Creek-1 | | RIVER | 5.306 MILES | Salt Creek from mouth of Canyon to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020201-005_00 | Salt Creek-2 | | RIVER | 22.66 MILES | Salt Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT16020201-006_00 | Hop Creek | | RIVER | 21.915 MILES | Hop Creek and tributaries from confluence with Salt Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020201-007_00 | Summit Creek | | RIVER | 10.192 MILES | Summit Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-001_00 | Spanish Fork River-1 | | RIVER | 16.975 MILES | Spanish Fork River from Utah Lake to Moark Diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-002_00 | Spanish Fork River-2 | | RIVER | 6.478 MILES | Spanish Fork River from Moark Diversion to Thistle Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-003_00 | Hobble Creek-1 | | RIVER | 9.787 MILES | Hobble Creek from Utah Lake to confluence of Left Fork Hobble Creek and Right Fork Hobble Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-004_00 | Hobble Creek-2 | | RIVER | 28.476 MILES | Left Fork Hobble Creek and tributaries from confluence with Right Fork to headwaters | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-005_00 | Hobble Creek-3 | | RIVER | 18.478 MILES | Right Fork Hobble Creek and tributaries from confluence with Left Fork to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-006_00 | Diamond Fork-1 | | RIVER | 20.062 MILES | Diamond Fork Creek and tributaries from confluence with Spanish Fork River to Sixth Water confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Hydromodification<br>• Habitat Modification - other than Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Other flow regime alterations<br>Physical substrate habitat alterations | | Pollution<br>Pollution | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-007_00 | Diamond Fork-2 | | RIVER | 4.512 MILES | Diamond Fork Creek and tributaries from Sixth Water Creek confluence to Hawthorne Campground | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-008_00 | Diamond Fork-3 | | RIVER | 22.924 MILES | Diamond Fork Creek and tributaries from Hawthorne Campground to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-009_00 | Sixth Water Creek | | RIVER | 12.452 MILES | Sixth Water Creek and tributaries except Fifth Water and First Water Creeks and tributaries from confluence with Diamond Fork Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Hydromodification<br>• Habitat Modification - other than Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Other flow regime alterations<br>Physical substrate habitat alterations | | Pollution<br>Pollution | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-010_00 | Third Water Creek | | RIVER | 20.682 MILES | Third Water Creek and tributaries from confluence with Sixth Water Creek to headwaters | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-011_00 | Cottonwood Creek | | RIVER | 14.437 MILES | Cottonwood Creek and tributaries from confluence with Sixth Water Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-012_00 | Soldier Creek-1 | | RIVER | 18.459 MILES | Soldier Creek from confluence with Thistle Creek to confluence of Starvation Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Sedimentation/Siltation | 2006<br>2006 | Completed<br>Completed | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-013_00 | Soldier Creek-2 | | RIVER | 6.451 MILES | Soldier Creek and tributaries from Starvation Creek confluence to headwaters | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-014_00 | Sheep Creek | | RIVER | 5.997 MILES | Sheep Creek and tributaries from confluence with Soldier Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-015_00 | Tie Fork | | RIVER | 15.437 MILES | Tie Fork and tributaries from confluence with Soldier Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-016_00 | Lake Fork | | RIVER | 22.328 MILES | Lake Fork and tributaries from USFS Boundary to headwaters | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-017_00 | Dairy Fork | | RIVER | 5.689 MILES | Dairy Fork and tributaries from confluence with Soldier Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-018_00 | Mill Fork | | RIVER | 9.381 MILES | Mill Fork and tributaries from confluence with Soldier Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-019_00 | Clear Creek | | RIVER | 12.63 MILES | Clear Creek and tributaries from confluence with Soldier Creek to headwaters | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-020_00 | Starvation Creek | | RIVER | 19.495 MILES | Starvation Creek and tributaries from confluence with Soldier Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-021_00 | Indian Creek | | RIVER | 3.144 MILES | Indian Creek and tributaries from confluence with Soldier Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-022_00 | Thistle Creek-1 | | RIVER | 18.28 MILES | Thistle Creek from confluence with Soldier Creek to confluence with Little Clear Creek | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-023_00 | Thistle Creek-2 | | RIVER | 16.815 MILES | Thistle Creek and tributaries from confluence with Little Clear Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-024_00 | Bennie Creek | | RIVER | 13.359 MILES | Bennie Creek and tributaries from confluence with Thistle Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-025_00 | Nebo Creek | | RIVER | 36.667 MILES | Nebo Creek and tributaries from confluence with Thistle Creek to headwaters | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-026_00 | Spring Creek | | RIVER | 11.008 MILES | Spring Creek and tributaries from confluence with Beer Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-027_00 | Beer Creek | | RIVER | 18.764 MILES | Beer Creek and tributaries from confluence with Spring Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020202-028_00 | Peteetneet Creek | | RIVER | 17.352 MILES | Peteetneet Creek and tributaries from Maple Dell Campground to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-030_00 | Benjamin Slough | | RIVER | 5.359 MILES | Benjamin Slough from confluence with Utah Lake to Beer Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-031_00 | Moark | | RIVER | 5.5 MILES | Spanish Fork River east side tributaries from Moark Diversion to Diamond Fork confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-032_00 | Thistle Creek-5 | | RIVER | 0.1 MILES | Thistle Creek tributaries between Bennie Creek and Nebo Creek confluences | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-033_00 | Soldier Creek-3 | | RIVER | 0.109 MILES | Soldier Creek north side perennial tributaries between Tie Fork and Sheep Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-034_00 | Soldier Creek-4 | | RIVER | 3.691 MILES | Soldier Creek south side tributaries from confluence with Thistle Creek to Dairy Fork confluence, excluding Lake Fork above USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-035_00 | Dry Creek-1 | | RIVER | 5.222 MILES | Dry Creek and tributaries from Utah Lake (Provo Bay) to Interstate 15 | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-036_00 | Dry Creek-2 | | RIVER | 6.507 MILES | Dry Creek and tributaries from Interstate 15 to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-037_00 | Thistle Creek-3 | | RIVER | 10.719 MILES | Thistle Creek east side tributaries from confluence with Soldier Creek upstream to confluence with Little Clear Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-038_00 | Thistle Creek-4 | | RIVER | 0.098 MILES | Thistle Creek west and south side tributaries from Nebo Creek to Little Clear Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020202-039_00 | Soldier Creek-5 | | RIVER | 0.098 MILES | Soldier Creek south side tributaries between Mill Fork confluence and Clear Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-001_00 | Provo River-1 | | RIVER | 10.262 MILES | Provo River from Utah Lake to Murdock Diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-002_00 | Provo River-2 | | RIVER | 3.655 MILES | Provo River from Murdock Diversion to Olmstead Diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-003_00 | Provo River-3 | | RIVER | 5.907 MILES | Provo River from Olmstead Diversion to Deer Creek Reservoir | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-004_00 | Provo River-4 | | RIVER | 9.54 MILES | Provo River from Deer Creek Reservoir to Jordanelle Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown<br>• Livestock (Grazing or Feeding |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | Operations)<br>• Natural Sources |
| Domestic Water Supply | Not Supporting | N | Escherichia coli | 2010 | Low Priority | |
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2010 | Low Priority | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16020203-005_00 | Provo River-5 | RIVER | 7.893 MILES | Provo River from Jordanelle Reservoir to Woodland |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-006_00 | Provo River-6 | | RIVER | 83.394 MILES | Provo River and tributaries from Woodland to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-007_00 | South Fork Provo River | | RIVER | 20.6 MILES | Lower South Fork Provo River and tributaries from confluence with Provo River to headwaters | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-008_00 | North Fork Provo River | | RIVER | 9.016 MILES | North Fork Provo River and tributaries from confluence with Provo River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-009_00 | Main Creek-1 | | RIVER | 6.206 MILES | Main Creek and tributaries from Deer Creek Reservoir to Round Valley | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown<br>• Natural Sources |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2010 | Low Priority | |
| Domestic Water Supply | Not Supporting | N | Escherichia coli | 2010 | Low Priority | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2010 | Low Priority | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-010_00 | Main Creek-2 | | RIVER | 32.196 MILES | Main Creek and tributaries from Round Valley to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020203-011_00 | Daniels Creek-1 | | RIVER | 10.041 MILES | Daniels Creek and tributaries from confluence with Deer Creek Reservoir to Whiskey Springs | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-012_00 | Daniels Creek-2 | | RIVER | 15.948 MILES | Daniels Creek and tributaries from Whiskey Springs to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-013_00 | Provo Deer Creek | | RIVER | 19.137 MILES | Provo Deer Creek and tributaries from confluence with Provo River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown<br>• Natural Sources |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Not Supporting | N | Escherichia coli | 2010 | Low Priority | |
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2010 | Low Priority | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-014_00 | Snake Creek-1 | | RIVER | 4.085 MILES | Snake Creek from confluence with Provo River to Wasatch Mountain State Park Golf Course | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Not Supporting | N | Arsenic<br>Escherichia coli | 2006<br>2010 | Medium Priority<br>Medium Priority | |
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2010 | Medium Priority | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-015_00 | Snake Creek-2 | | RIVER | 17.689 MILES | Snake Creek and tributaries from Wasatch Mountain State Park to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-016_00 | McHenry Creek | | RIVER | 2.453 MILES | McHenry Creek and tributaries from Jordanelle Reservoir to headwaters | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-017_00 | Little South Fork Provo | | RIVER | 22.46 MILES | Little South Fork Provo River and tributaries from confluence with Provo River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-018_00 | South Fork Provo | | RIVER | 27.757 MILES | Upper South Fork Provo River and tributaries from confluence with Provo River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-019_00 | Lake Creek-2 | | RIVER | 15.133 MILES | Lake Creek and tributaries above Timber Creek confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020203-020_00 | Lost Creek | | RIVER | 0.01 MILES | HUC: 16020203 | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-021_00 | Upper Falls Drainage | | RIVER | 1.117 MILES | Upper Falls above Bridal Veil Falls | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-022_00 | Bridal Veil Falls | | RIVER | 0.01 MILES | Bridal Veil Falls from falls to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-023_00 | Lower Provo Tributaries | | RIVER | 0.01 MILES | HUC: 16020203 | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
|---|---|---|---|---|
| UT16020203-024_00 | Rock Canyon | RIVER | 2.635 MILES | Rock Canyon and tributaries from mouth to headwaters |

| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-025_00 | Provo Canyon | | RIVER | 1.314 MILES | HUC: 16020203 | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020203-026_00 | Heber Valley | | RIVER | 31.482 MILES | Provo River east side tributaries from Daniels Creek to Little South Fork except Lake Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-028_00 | Provo Tribs-Heber | | RIVER | 13.927 MILES | Provo River west side tributaries from Deer Creek Dam to Jordanelle Dam except Snake Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020203-029_00 | Mill Race Creek-1 | | RIVER | 8.594 MILES | Mill Race Creek and tributaries from HUC boundary (16020203) to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-001_00 | Jordan River-1 | | RIVER | 7.602 MILES | Jordan River from Farmington Bay upstream contiguous with the Davis County line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown<br>• Livestock (Grazing or Feeding Operations)<br>• Urban Runoff/Storm Sewers<br>• Industrial Point Source Discharge<br>• Municipal Point Source Discharges |
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2010 | Medium Priority | |
| Warm Water Aquatic Life | Not Supporting | N | Oxygen, Dissolved | 2006 | High Priority | |
| Wildlife Habitat | Not Supporting | N | Oxygen, Dissolved | 2006 | High Priority | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020204-002_00 | Jordan River-2 | | RIVER | 4.456 MILES | Jordan River from Davis County line upstream to North Temple Street | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Natural Sources<br>• Agriculture |
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2006 | Medium Priority | • Urban Runoff/Storm Sewers<br>• Industrial Point Source Discharge |
| Warm Water Aquatic Life | Not Supporting | N | Oxygen, Dissolved | 2006 | High Priority | • Municipal Point Source Discharges |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-003_00 | Jordan River-3 | | RIVER | 4.197 MILES | Jordan River from North Temple to 2100 South | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Natural Sources |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2006 | Medium Priority | • Agriculture<br>• Urban Runoff/Storm Sewers<br>• Industrial Point Source Discharge<br>• Municipal Point Source Discharges |
| Warm Water Aquatic Life | Not Supporting | N | Oxygen, Dissolved<br>Phosphorus (Total) | 2008<br>2008 | High Priority<br>High Priority | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-004_00 | Jordan River-4 | | RIVER | 9.406 MILES | Jordan River from 2100 South to the confluence with Little Cottonwood Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2008 | High Priority | • Natural Sources<br>• Urban Runoff/Storm Sewers<br>• Source Unknown |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-005_00 | Jordan River-5 | | RIVER | 1.629 MILES | Jordan River from the confluence with Little Cottonwood Creek to 7800 South | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2006 | High Priority | • Agriculture<br>• Urban Runoff/Storm Sewers |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2006 | High Priority | • Source Unknown<br>• Natural Sources |
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2006 | Medium Priority | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-006_00 | Jordan River-6 | | RIVER | 10.291 MILES | Jordan River from 7800 South to Bluffdale | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2006 | High Priority | • Industrial Point Source Discharge |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2006 | High Priority | • Municipal Point Source Discharges |
| Domestic Water Supply | Fully Supporting | N | | | | • Urban Runoff/Storm Sewers |
| Secondary Recreation | Not Assessed | N | | | | • Source Unknown |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16020204-007_00 | Jordan River-7 | RIVER | 4.175 MILES | Jordan River from Bluffdale to Narrows |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2006 | High Priority | • Industrial Point Source Discharge |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2006 | High Priority | • Municipal Point Source Discharges<br>• Natural Sources |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | • Urban Runoff/Storm Sewers<br>• Source Unknown |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-008_00 | Jordan River-8 | | RIVER | 14.15 MILES | Jordan River from Narrows to Utah Lake | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2006 | High Priority | • Industrial Point Source Discharge<br>• Municipal Point Source Discharges<br>• Natural Sources |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| UT16020204-009_00 | City Creek-1 | | RIVER | 4.23 MILES | City Creek and tributaries from Memory Park to SLC WTP | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-010_00 | City Creek-2 | | RIVER | 4.758 MILES | City Creek and tributaries from filtration plant to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Supporting | N | Cadmium | 2010 | Low Priority | • Source Unknown |
| Domestic Water Supply | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-011_00 | Red Butte Creek | | RIVER | 4.556 MILES | Red Butte Creek and tributaries from Red Butte Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-012_00 | Emigration Creek | | RIVER | 4.293 MILES | Emigration Creek and tributaries from Foothill BLVD to headwaters | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Fully Supporting | N | | | | • On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) |
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2008 | High Priority | • Natural Sources<br>• Urban Runoff/Storm Sewers |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-013_00 | Parley Canyon Creek-2 | | RIVER | 13.337 MILES | Parleys Canyon Creek and tributaries from Mountain Dell Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-014_00 | Mountain Dale Creek-1 | | RIVER | 0.716 MILES | Mountain Dell Creek from Mountain Dell Reservoir to Little Dell Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-015_00 | Mountain Dale Creek-2 | | RIVER | 8.076 MILES | Mountain Dell Creek and tributaries from to Little Dell Reservoir headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16020204-017_00 | Mill Creek-2 | RIVER | 7.364 MILES | Mill Creek and tributaries from Interstate 15 to USFS Boundary |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-018_00 | Mill Creek-3 | | RIVER | 14.52 MILES | Mill Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-019_00 | Big Cottonwood Creek-1 | | RIVER | 9.525 MILES | Big Cottonwood Creek and tributaries from Jordan River to Big Cottonwood WTP | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Temperature, water | 2006 | Low Priority | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16020204-020_00 | Big Cottonwood Creek-2 | RIVER | 34.009 MILES | Big Cottonwood Creek and tributaries from Big Cottonwood WTP to headwaters |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Fully Supporting | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-021_00 | Little Cottonwood Creek-1 | | RIVER | 8.734 MILES | Little Cottonwood Creek and tributaries from Jordan River confluence to Metropolitan WTP | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2006 | | • Urban Runoff/Storm Sewers<br>• Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2006 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-022_00 | Little Cottonwood Creek-2 | | RIVER | 21.489 MILES | Little Cottonwood Creek and tributaries from Metropolitan WTP to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments<br>Zinc | 2008<br>1998 | Low Priority<br>Completed | • Source Unknown<br>• Resource Extraction |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Fully Supporting | N | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16020204-023_00 | Bingham Creek | RIVER | 5.355 MILES | Bingham Creek and tributaries from confluence with Jordan River to headwaters |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-024_00 | Butterfield Creek | | RIVER | 1.747 MILES | Butterfield Creek and tributaries from confluence with Jordan River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-025_00 | Parley Canyon Creek-1 | | RIVER | 11.434 MILES | Parleys Canyon Creek and tributaries from 1300 East to Mountain Dell Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | • Wastes from Pets<br>• Natural Sources |
| Domestic Water Supply | Not Supporting | N | Escherichia coli | 2010 | Medium Priority | |
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2010 | Medium Priority | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16020204-026_00 | Mill Creek-1 | RIVER | 1.032 MILES | Mill Creek from confluence with Jordan River to Interstate 15 crossing |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-027_00 | Coon Creek | | RIVER | 0.091 MILES | Perennial portion of Coon Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-028_00 | Barneys Canyon Creek | | RIVER | 0.01 MILES | Barney Canyon Creek and tributaries from mouth to headwaters | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16020204-029_00 | Rose Creek | | RIVER | 4.087 MILES | Rose Creek and tributaries from confluence with Jordan River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Jordan River Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| Wildlife Habitat | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT-160300006-002 | Pinto Creek | | STREAM | 28.1 MILES | Pinto Creek, Middle Pinto Creek, and tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

**Table 6-4 Summary of Individual Lake and Reservoir Support for Jordan River Watershed Management Unit**

| Summary of Individual Lake and Reservoir Support for Jordan River Watershed Management Unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16020202-002 | Big East Lake | 5 | 4 | DO | | | | | TP | | Y | NS | NS | NS | NS | |
| UT-L-16020203-001 | Deer Creek Reservoir | 4 | 4 | T, DO, TP | NS | NS | FS | | TP | | Y | NS | FS | FS | NS | NS |
| UT-L-16020203-003 | Jordanelle Reservoir | 2 | 2 | | FS | FS | FS | | No | | N | FS | FS | FS | FS | FS |

| Summary of Individual Lake and Reservoir Support for Jordan River Watershed Management Unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16020204-024 | Lake Mary | 2 | 2 | | | | | | | | N | FS | FS | FS | FS | |
| UT-L-16020204-026 | Little Dell Reservoir | 2 | 2 | | | | | | | | Y | FS | FS | FS | FS | |
| UT-L-16020203-004 | Mill Hollow Reservoir | 5 | 5 | pH | | | | | | | Y | NS | NS | NS | NS | |
| UT-L-16020201-001 | Mona Reservoir | 2 | 2 | | | | | | | | N | FS | FS | NS | FS | |

| Summary of Individual Lake and Reservoir Support for Jordan River Watershed Management Unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16020202-001 | Salem Pond | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |
| UT-L-16020201-006 | Silver Lake Flat Reservoir | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |
| UT-L-16020201-005 | Tibble Fork Reservoir | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |
| UT-L-16020203-002 | Trial Lake | 2 | 3B | FS | FS | FS | NS | | TP | | N | FS | FS | FS | FS | NS |

| Summary of Individual Lake and Reservoir Support for Jordan River Watershed Management Unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16020201-004 | Utah Lake | 5 | 5 | TDS | FS | FS | FS | PCBs | TP, TSI | | Y | NS | NS | NS | NS | NS |
| UT-L-16020203-006 | Wall Lake | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |
| UT-L-16020203-005 | Washington Lake | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |

| Summary of Individual Lake and Reservoir Support for Jordan River Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |

**Notes:**

FS Fully Supporting

NS Not Supporting

Y Yes

N No

DO Dissolved Oxygen

FK Fish Kill

T Temperature

Total P Total Phosphorus

NA Not Analyzed

PCBs Polychlorinated Biphenyls

**Table 6-5 Individual Lake and Reservoir 2010 Trophic State Index (TSI) Jordan River Watershed**

| Individual Lake and Reservoir 2010 Trophic State Index (TSI) Jordan River Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Jordan River / Utah Lake | UT-L-16020202-002 | Big East Lake | 7/23/2007 | | 44 | 37 |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 5/16/2007 | 44 | 44 | 37 |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 6/21/2007 | 42 | 40 | 37 |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 7/18/2007 | 47 | 46 | 37 |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 8/9/2007 | 52 | 52 | 37 |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 8/22/2007 | 50 | 50 | 37 |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 9/12/2007 | 43 | 49 | 37 |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 5/7/2008 | 52 | 57 | 50 |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 6/4/2008 | 42 | 45 | 37 |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 7/9/2008 | 37 | 43 | 37 |

| Individual Lake and Reservoir 2010 Trophic State Index (TSI)<br>Jordan River Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 8/7/2008 | 51 | 53 | 37 |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 9/4/2008 | 45 | 58 | 74 |
| Jordan River / Utah Lake | UT-L-16020203-003 | Jordanelle Reservoir | 7/17/2007 | 37 | 40 | 44 |
| Jordan River / Utah Lake | UT-L-16020203-002 | Trial Lake | 9/14/2007 | 55 | 8 | 47 |
| Jordan River / Utah Lake | UT-L-16020201-004 | Utah Lake | 6/20/2007 | 70 | 57 | 50 |
| Jordan River / Utah Lake | UT-L-16020201-004 | Utah Lake | 7/10/2007 | 75 | 53 | 37 |
| Jordan River / Utah Lake | UT-L-16020201-004 | Utah Lake | 8/16/2007 | 77 | 77 | 59 |
| Jordan River / Utah Lake | UT-L-16020201-004 | Utah Lake | 9/27/2007 | | 72 | 55 |
| Jordan River / Utah Lake | UT-L-16020201-004 | Utah Lake | 7/23/2008 | 73 | 64 | 37 |
| Jordan River / Utah Lake | UT-L-16020201-004 | Utah Lake | 8/4/2008 | 84 | 73 | 64 |

| Individual Lake and Reservoir 2010 Trophic State Index (TSI)<br>Jordan River Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Jordan River / Utah Lake | UT-L-16020201-004 | Utah Lake | 9/17/2008 | 77 | 62 | 76 |

Notes:

TSI-SD = Trophic State Index from secchi disk

TSI-Chla = Trophic State Index from chlorophyll-a

TSI-TP = Trophic State Index from total phosphorus

**Table 6-6 Summary of Individual Lake and Reservoir Trophic State Index (TSI)**

| Summary of Individual Lake and Reservoir Trophic State Index (TSI) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Jordan River / Utah Lake | UT-L-16020202-002 | Big East Lake | 52 | 48 | 41 | 41 | 42 | 48 | NA | 50 | 41 | 44 | M | M |
| Jordan River / Utah Lake | UT-L-16020203-001 | Deer Creek Reservoir | 48 | 47 | 43 | 43 | 44 | 42 | 39 | 48 | 45 | 49 | M | M |
| Jordan River / Utah Lake | UT-L-16020203-003 | Jordanelle Reservoir | | | 45 | 44 | 43 | 41 | 43 | 45 | 39 | 38 | O | O |
| Jordan River / Utah Lake | UT-L-16020203-002 | Trial Lake | 43 | 38 | 40 | 35 | 43 | 48 | 46 | NA | 36 | 8 | O | O |
| Jordan River / Utah Lake | UT-L-16020201-004 | Utah Lake | 69 | 68 | 68 | 64 | 68 | 70 | 69 | 66 | 65 | 65 | E | E |

| Summary of Individual Lake and Reservoir Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |

Notes:

2010 Old Method TSI calculated using the 2008 Integrated Report Methodology

2010 Current Method TSI calculated using the 2010 Integrated Report Methodology of only chlorophyll-a

O = Oligotrophic

M = Mesotrophic

E = Eutrophic

H = Hypereutrophic

# Figures

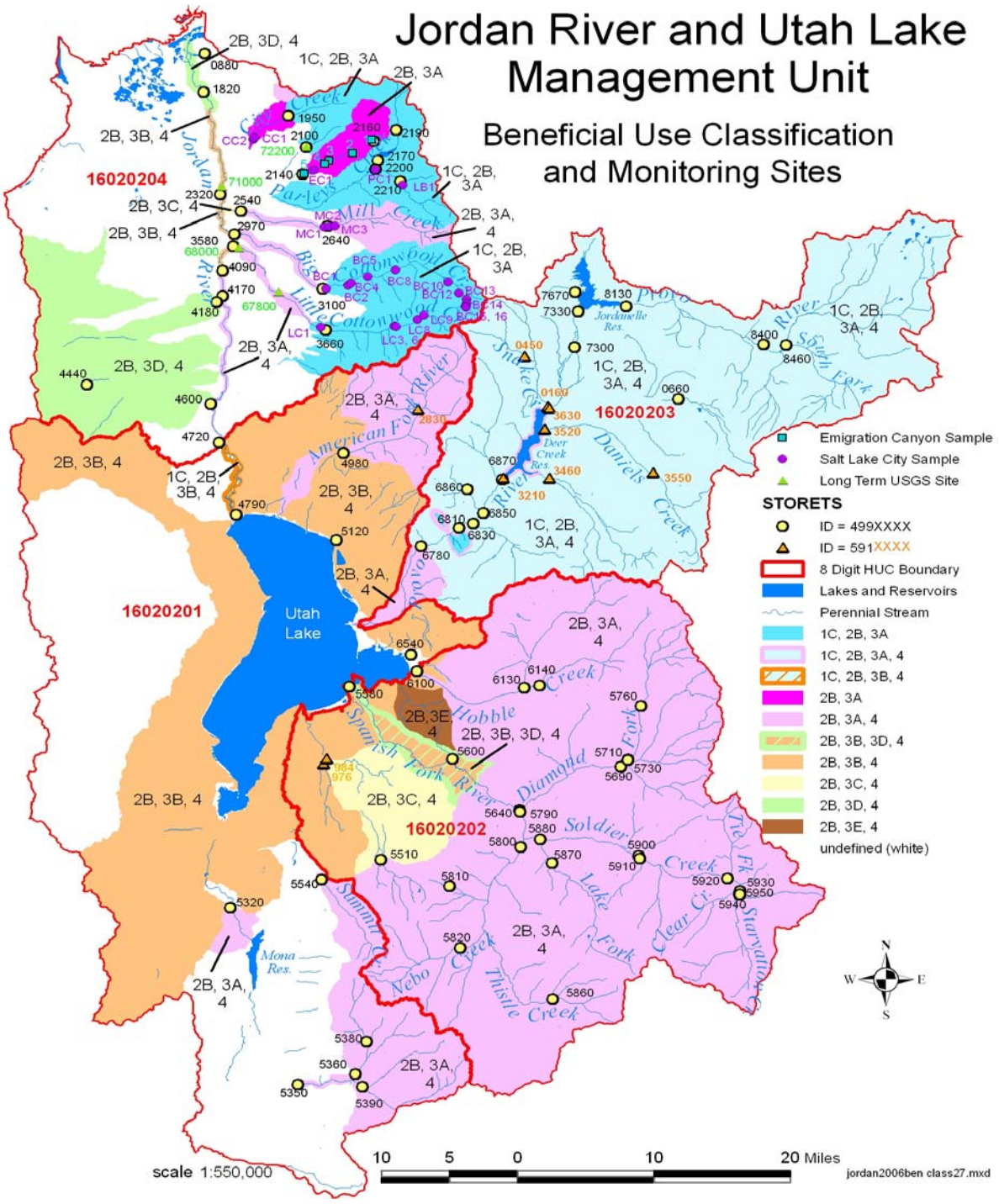


**Figure 6-1 Beneficial Use Classes for Jordan River Watershed Management Unit**

# CHAPTER 7: UINTA WATERSHED MANAGEMENT UNIT WATER QUALITY ASSESSMENT

## 7.1 INTRODUCTION

The Uinta Watershed Management Unit lies in northeastern Utah and includes the USGS. hydrological units listed in Table 7-1. This unit includes the Green River and the tributaries streams that flow into it downstream to approximately where the Price River enters the Green River. Tributary streams include those on the north and south slopes of the Uinta Mountains. Major streams on the north slope of the Uinta Mountains include the West Fork Blacks Fork, East Fork Blacks Fork, Blacks Fork, West Fork Smiths Fork, East Fork Smiths Fork, Henry's Fork and Burnt Fork Rivers. Major south slope streams include Currant Creek, Duchesne River, Rock Creek, Lake Fork Creek, Yellowstone River, Uinta River, Ashley Creek, and Brush Creek. Two other major rivers are the Strawberry and White Rivers. The Strawberry River, located in the western part of the management unit, flows east to join the Duchesne River downstream from Starvation Reservoir. The White River flows west from the Utah-Colorado border to join the Green River near the confluence of the Duchesne and Green Rivers. Smaller tributaries to the south include Nine Mile Creek and Range Creek.

Biological, water chemistry and field data collected from January 1, 2004 through December 31, 2008 were used to make assessments. Water quality data were compared against standards established for each of the designated beneficial uses. The beneficial uses for the Uinta Watershed are shown on Figure 7-1.

## 7.2 IMPAIRED WATERS

The list of streams and lakes impaired and requiring a TMDL (Category 5; Section 303d) for the Uinta Basin Watershed Management Unit are presented in Table 7-2. New listings for 2010 include Strawberry River-1, Big Sand Wash Reservoir, Calder Reservoir, Red Fleet Reservoir, and Starvation Reservoir. Brough, Steinaker and Red Fleet Reservoirs now have approved TMDLs and are removed from the 303d list (Table 7-3). Several streams previously in Category 4A (TMDL complete) are now attaining the water quality standards (Table 7-4). Assessment results for all stream AUs are presented in Table 7-5 and lakes in Table 7-6. Lake assessments are further discussed in the next section.

## 7.3 LAKE ASSESSMENTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends.

Table 7-7 shows TSIs based on each sample collected from May through September by sample date. Table 7-8 contains a summary of lake trophic status by study periods. Note that some of the changes in TSIs between assessment periods is due to the variability in the lakes and reservoirs and some is due to switching methodologies between 2008 and 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). Table 7-8 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. Small differences were observed for Brough Reservoir, East Park Reservoir, Marsh Lake, and Pelican Lake. Medium differences were observed for Flaming Gorge Reservoir and Strawberry Reservoir. Large differences were observed for Matt Warner and Oak Park Reservoirs.

Matt Warner Reservoir changed from eutrophic in the 2008 IR to oligotrophic in 2010 with TSIs of 58 and 18, respectively. Using the 2008 IR method for calculating the TSI, the reservoir would be classified as mesotrophic for 2010 with a TSI of 43. This suggests that Matt Warner had an actual reduction in trophic status that was exaggerated by the change in TSI reporting methods. As shown in Table 2.14.2, a TSI-TP was not available and a large difference was observed between the TSI-Chla and TSI-SD (50). The large discrepancy between the TSI-Chla and TSI-SD suggest that the water is turbid from nonalgal sources. Matt Warner is on the 303d list for dissolved oxygen and total phosphorus but was fully supporting for 2010 although total phosphorus remains elevated. For the 2008 IR, pH was elevated but was fully supporting for 2010 supporting that the trophic status is lower for 2010.

Oak Park Reservoir is classified oligotrophic whether using the 2008 IR TSI method or the 2010 IR method. As shown in Table 7-6, the markedly lower TSI-Chla compared to the TSI-SD and TSI-TP suggests that light attenuation is dominated by nonalgal particulates or color.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. Consistent trends that resulted in a net TSI change of five or changes greater than 10 between 2008 and 2010, which are not attributable to the change in TSI methodology alone, are identified. Oak Park and and Matt Warner Reservoirs exhibit a decreasing trend in TSI.

## 7.4 HEALTH ADVISORIES

Green River-3, Rock Creek, Red Fleet Reservoir, and Steinaker Reservoir, have fish consumption advisories for mercury.

# TABLES

**Table 7-1 USGS Hydrological Units in the Uinta Watershed Management Unit**

| USGS Hydrological Units in the Uinta Watershed Management Unit | |
|---|---|
| **Number** | **Name** |
| 14040106 | Upper Green-Flaming Gorge Reservoir |
| 14040107 | Blacks Fork |
| 14040108 | Muddy |
| 14050007 | Lower White |
| 14060001 | Lower Green-Diamond |
| 14060002 | Ashley-Brush |
| 14060003 | Duchesne |
| 14060004 | Strawberry |
| 14060005 | Lower Green - Desolation Canyon |
| 14060006 | Willow |

**Table 7-2 Impaired Streams and Lakes Requiring a TMDL – Uinta Basin Watershed**

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060002-001_00 | Lower Ashley Creek | RIVER | 8.097 MILES | Ashley Creek and tributaries from Green River confluence to Vernal sewage lagoons |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Total Dissolved Solids | 1992 | | Agricultural | • Agriculture<br>• Industrial Point Source Discharge<br>• Municipal Point Source Discharges<br>• Natural Sources |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060002-002_00 | Middle Ashley Creek | RIVER | 12.282 MILES | Ashley Creek and tributaries from Vernal sewage lagoons to Dry Fork confluence |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Selenium | 2008 | Low Priority | Warm Water Aquatic Life | • Agriculture<br>• Natural Sources |
| Total Dissolved Solids | 2008 | Low Priority | Agricultural | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060002-003_00 | Brush Creek | RIVER | 22.739 MILES | Brush Creek and tributaries from confluence with Green River to Red Fleet Dam but excluding Little Brush Creek |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Selenium | 2006 | Medium Priority | Agricultural<br>Warm Water Aquatic Life | • Natural Sources |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060002-008_00 | Lower Dry Fork Creek | RIVER | 5.77 MILES | Dry Fork and tributaries from confluence with Ashley Creek to USFS boundary |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060003-002_00 | Duchesne River-2 | RIVER | 31.593 MILES | Duchesne River and tributaries from confluence with Uinta River to Myton |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Warm Water Aquatic Life | • Source Unknown |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060003-005_00 | Antelope Creek | RIVER | 31.574 MILES | Antelope Creek and tributaries from Duchesne River confluence to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Boron<br><br>Total Dissolved Solids | 2008<br><br>1998 | Low Priority<br><br>High Priority | Agricultural<br><br>Agricultural | • Agriculture<br>• Habitat Modification - other than Hydromodification<br>• Natural Sources |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060003-006_00 | Duchesne River-3 | RIVER | 39.455 MILES | Duchesne River from Myton to Strawberry River confluence |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060004-001_00 | Strawberry River-1 | RIVER | 5.941 MILES | Strawberry River from confluence with Duchesne River to Starvation Dam |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Boron | 2010 | Low Priority | Agricultural | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060004-002_00 | Indian Canyon Creek | RIVER | 44.01 MILES | Indian Canyon Creek and tributaries from Strawberry River confluence to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| Arsenic | 2008 | Low Priority | Domestic Water Supply | • Source Unknown<br>• Agriculture |
| Boron | 2008 | Low Priority | Agricultural | • Habitat Modification - other than Hydromodification |
| Total Dissolved Solids | 1998 | High Priority | Agricultural | • Natural Sources |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060004-005_00 | Avintaquin Creek | RIVER | 53.837 MILES | Avintaquin Creek and tributaries from Strawberry River confluence to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Arsenic | 2008 | Low Priority | Domestic Water Supply | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| UT14060005-002_00 | Pariette Draw Creek | RIVER | 54.096 MILES | Pariette Draw Creek and tributaries from Green River confluence to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Boron<br><br>Selenium<br><br>Total Dissolved Solids | 1998<br><br>1998<br><br>1998 | High Priority<br><br>High Priority<br><br>High Priority | Agricultural<br><br>Warm Water Aquatic Life<br><br>Wildlife Habitat<br><br>Agricultural | • Agriculture<br>• Habitat Modification - other than Hydromodification<br>• Natural Sources<br>• Irrigated Crop Production<br>• Livestock (Grazing or Feeding Operations) |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060005-003_00 | Ninemile Creek | RIVER | 119.076 MILES | Ninemile Creek and tributaries from Green River confluence to headwaters |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 1998 | High Priority | Cold Water Aquatic Life | • Agriculture<br>• Habitat Modification - other than Hydromodification |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14040106-016_00 | Sheep Creek Lake | FRESHWATER LAKE | 86 ACRES | LL= 405322/1095059 2N 18E 23,24 USGS MAP AND DATE: JESSON-BUTTE, UTAH-WYOMING-1963 WATERSHED: BEAVER CREEK |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| pH | 2006 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| UT-L-14040106-034_00 | Calder Reservoir | FRESHWATER RESERVOIR | 99 ACRES | HUC: 14040106, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14040107-003_00 | Marsh Lake | FRESHWATER LAKE | 38 ACRES | LL= 405729/1102342 3N 14E 30,31 USGS MAP AND DATE: BRIDGER LAKE, UTAH-1967 WATERSHED: UNNAMED TRIBUTARY TO E. FORK SMITH'S FORK, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| UT-L-14040107-004_00 | Bridger Lake | FRESHWATER LAKE | 128 ACRES | LL= 405842/1102307 3N 13E 17,18,19 USGS MAP AND DATE: BRIDGER LAKE UTAH-WYOMING-1967 WATERSHED: EAST FORK SMITH'S FORK, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | High Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14040107-005_00 | Lyman Lake | FRESHWATER LAKE | 27 ACRES | HUC: 14040107 WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| UT-l-14040107-006_00 | China Lake | FRESHWATER LAKE | 31 ACRES | HUC: 14040107, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14060001-001_00 | Pelican Lake | FRESHWATER LAKE | 1680 ACRES | LL= 401142/1094052 7S 20E 19,20,21,28,29 USGS MAP AND DATE: PELICAN LAKE, UTAH-1964 WATERSHED: LAKE CANAL, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| pH | 2004 | Low Priority | Warm Water Aquatic Life | • Livestock (Grazing or Feeding Operations)<br>• Source Unknown |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14060001-002_00 | Brough Reservoir | FRESHWATER RESERVOIR | 128 ACRES | HUC: 14060001, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14060002-004_00 | Steinaker Reservoir | FRESHWATER LAKE | 829 ACRES | LL= 403058/1093152 3,4S 21E 26,34,35,,2,3 USGS MAP AND DATE: STEINAKER RESERVOIR, UTAH-1978 WATERSHED: STEINAKER FEEDER CANAL, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14060002-006_00 | Red Fleet Reservoir | FRESHWATER LAKE | 520 ACRES | HUC: 14060002, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14060003-230_00 | Big Sand Wash Reservoir | FRESHWATER LAKE | 390 ACRES | LL= 401802/1101317 2S 3N 9,15,16,21,22 USGS MAP AND DATE: BLUEBELL, UTAH-1965 WATERSHED: BIG SAND WASH, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2010 | Low Priority | Cold Water Aquatic Life | |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14060004-001_00 | Strawberry Reservoir | FRESHWATER LAKE | 17160 ACRES | LL= 401112/1110840 3S,4S 11W,12W USGS MAP AND DATE:STRAWBERRY RES.NE 57800-1966,STRAWBERRY RES.NE 59900-1975WATERSHED: STRAWBERRY, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | | Cold Water Aquatic Life | |
| Phosphorus (Total) | 2006 | | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL - Unita Basin Watershed | | | | |
|---|---|---|---|---|
| UT-L-14060004-006_00 | Starvation Reservoir | FRESHWATER LAKE | 2760 ACRES | LL= 401100/1102800 3,4S 5,6W 1-3,6,14-16,21,22,25,28,29-31,33,36 USGS MAP AND DATE: DUCHESNE, UTAH 1965 WATERSHED: STRAWBERRY RIVER, WMU Uinta Basin |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2008 | Low Priority | Cold Water Aquatic Life | |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | |

**Table 7-3 Lakes Delisted and in Category 4A – Uinta Basin Watershed**

| Lakes Delisted and in Category 4A<br>Uinta Basin Watershed | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Unit** | **AU Name** | **Location Description** | **Water Type** | **Size** | **Cause** | **Reason for Removal** | **Delisting Comment** |
| UT-L-14060001-002_00 | Brough Reservoir | HUC: 14060001, WMU Uinta Basin | FRESHWATER RESERVOIR | 128 ACRES | Oxygen, Dissolved | TMDL approved or established by EPA (4A) | N/A |
| UT-L-14060002-004_00 | Steinaker Reservoir | LL= 403058/1093152 3,4S 21E 26,34,35,,2,3 USGS MAP AND DATE: STEINAKER RESERVOIR, UTAH-1978 WATERSHED: STEINAKER FEEDER CANAL, WMU Uinta Basin | FRESHWATER LAKE | 829 ACRES | Oxygen, Dissolved | TMDL approved or established by EPA (4A) | N/A |
| UT-L-14060002-006_00 | Red Fleet Reservoir | HUC: 14060002, WMU Uinta Basin | FRESHWATER LAKE | 520 ACRES | Oxygen, Dissolved | TMDL approved or established by EPA (4A) | N/A |

**Table 7-4 Stream Assessment Units Now Meeting Water Quality Standard**

| Stream Assessment Units Now Meeting Water Quality Standard | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Unit** | **AU Name** | **Location Description** | **Water Type** | **Size** | **Cause** | **Reason for Removal** | **Delisting Comment** |
| UT14060003-003_00 | Uinta River-1 | Uinta River and tributaries from Duchesne River confluence upstream to Dry Gulch confluence | River | 7.25 Miles | Total Dissolved Solids | Applicable WQS attained; due to restoration activities | Approved TMDL, 4056, for TDS and TDS meeting WQS 2010. |
| UT14060003-008_00 | Lake Fork-1 | Lake Fork River and tributaries from Duchesne River confluence to | River | 19.643 Miles | Total Dissolved Solids | Applicable WQS attained; due to restoration activities | 33617 TMDL approved for TDS and TDS meeting WQS 2010 |

| Stream Assessment Units Now Meeting Water Quality Standard | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pigeon Water Creek confluence | | | | | |
| UT14060003-012_00 | Deep Creek | Deep Creek and tributaries from Uintah River confluence to headwaters | River | 24.858 Miles | Total Dissolved Solids | Applicable WQS attained; due to restoration activities | TMDL approved and TDS meeting WQS 2010 |

**Table 7-5 Assessment Results for Uinta Basin Stream Assessment Units**

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-001_00 | Dahlgreen Creek | | RIVER | 0.01 MILES | Dahlgreen Creek and tributaries from Utah-Wyoming state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-002_00 | Henrys Fork River | | RIVER | 52.017 MILES | Henrys Fork River and tributaries from Utah-Wyoming state line to headwaters | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-003_00 | West Fork Beaver Creek | | RIVER | 18.66 MILES | West Fork Beaver Creek and tributaries from Utah-Wyoming state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-004_00 | Middle Fork Beaver Creek | | RIVER | 30.083 MILES | Middle Fork Beaver Creek and tributaries from Utah-Wyoming state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-005_00 | Burnt Fork Creek | | RIVER | 36.53 MILES | Burnt Fork Creek and tributaries from Utah- | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | Wyoming state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-006_00 | Birch Creek-tribs | | RIVER | 14.922 MILES | Birch Creek tributaries Utah-Wyoming state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-007_00 | Sheep Creek | | RIVER | 70.084 MILES | Sheep Creek and tributaries from Flaming Gorge Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT14040106-008_00 | Green River-1 Tribs | | RIVER | 22.053 MILES | Green River perennial tributaries to Green River-1 (UT14040106-019) not specifially defined | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-009_00 | Birch Spring Draw | | RIVER | 17.727 MILES | Birch Spring Draw and tributaries from Flaming Gorge Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Non-Game Fish and Other Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-010_00 | Carter Creek | | RIVER | 89.858 MILES | Carter Creek and tributaries from Flaming Gorge Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT14040106-011_00 | Eagle Creek | | RIVER | 8.874 MILES | Eagle Creek and tributaries from Flaming Gorge Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-012_00 | Flaming Gorge Reservoir Tribs | | RIVER | 12.012 MILES | Flaming Gorge Reservoir tributaries not defined separately | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-013_00 | Spring Creek | | RIVER | 4.645 MILES | Spring Creek and tributaries from Flaming Gorge Reservoir to Utah-Wyoming state line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-014_00 | Cart Creek | | RIVER | 16.996 MILES | Cart Creek and tributaries from Flaming Gorge Reservoir to headwaters | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-015_00 | Gorge Creek | | RIVER | 8.378 MILES | Gorge Creek and tributaries from Green River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-016_00 | Davenport Creek | | RIVER | 4.478 MILES | Davenport Creek and tributaries from Green River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-017_00 | Goslin Creek | | RIVER | 3.721 MILES | Goslin Creek and tributaries from Green River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-018_00 | Red Creek | | RIVER | 14.055 MILES | Red Creek and tributaries from Green River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-019_00 | Green River-1 | | RIVER | 28.631 MILES | Green River from Utah-Colorado state line to | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | Flaming Gorge Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-020_00 | Jackson Creek | | RIVER | 11.148 MILES | Jackson Creek and tributaries from Green River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-021_00 | Pot Creek | | RIVER | 21.976 MILES | Pot Creek and tributaries from Crouse reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-022_00 | Sears Creek | | RIVER | 7.16 MILES | Sears Creek and tributaries from Green River confluence to headwaters | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-023_00 | Lower Pot Creek | | RIVER | 0.01 MILES | Pot Creek from Utah-Colorado state line to Crouse Reservoir outlet | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT14040106-024_00 | Willow Creek | | RIVER | 16.219 MILES | Willow Creek and tributaries from confluence with Green River to headwaters (Dagget Co.) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-025_00 | O-Wi-Yu-Kuts Creek | | RIVER | 2.109 MILES | O-Wi-Yu-Kuts Creek and tributaries from Willow Creek confluence to Utah-Colorado state line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-026_00 | Tolivers Creek | | RIVER | 4.217 MILES | Tolivers Creek from confluence with Green River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040106-027_00 | Beaver Creek | | RIVER | 1.258 MILES | Beaver Creek and tributaries (east of Willow Creek near 3 corners) from Colorado-Utah state line to Utah-Colorado state line | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040107-001_00 | Blacks Fork | | RIVER | 135.069 MILES | Blacks Fork River and tributaries from Utah-Wyoming state line at Meeks Cabin Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040107-002_00 | Archie Creek | | RIVER | 3.719 MILES | Archie Creek and tributaries from Utah-Wyoming state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040107--002_00 | Little West Fork | | RIVER | 5.34 MILES | Little West Fork: Utah-Wyoming stateline to headwaters. | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040107-003_00 | West Fork Smiths Fork | | RIVER | 19.3 MILES | West Fork Smiths Fork and tributaries from Utah-Wyoming state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040107-004_00 | Gilbert Creek | | RIVER | 6.683 MILES | Gilbert Creek and tributaries from Utah-Wyoming state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040107-005_00 | East Fork Smiths Fork | | RIVER | 48.412 MILES | East Fork Smiths Fork and tributaries from Utah-Wyoming state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14040108_00 | West Muddy Creek | | RIVER | 2.739 MILES | West Muddy Creek and tributaries from Utah-Wyoming state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14050007-001_00 | White River | | RIVER | 77.575 MILES | White River from confluence with Green River to Utah-Colorado state line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14050007-002_00 | Lower Bitter Creek | | RIVER | 0 MILES | Bitter Creek and tributaries from White River confluence to start of perennial stream (excluding Sweetwater Creek) | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14050007-003_00 | Evacuation Creek | | RIVER | 0.01 MILES | Evacuation Creek and tributaries from the confluence with White River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14050007-004_00 | Sweetwater Creek | | RIVER | 3.958 MILES | Sweetwater Creek and tributaries from Bitter Creek confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14050007-005_00 | Upper Bitter Creek | | RIVER | 24.808 MILES | Bitter Creek and tributaries from upper portion that | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | is perennial | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060001-001_00 | Green River-2 Tribs | | RIVER | 11.368 MILES | Green River tributaries from Duchesne River confluence to Utah-Wyoming border, except Ashley, Brush, and Jones Hole Creeks | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060001-002_00 | Jones Hole Creek | | RIVER | 5.953 MILES | Jones Hole Creek and tributaries from confluence with Green River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT14060001-003_00 | Diamond Gulch | | RIVER | 33.136 MILES | Diamond Gulch and tributaries from near Jones Hole Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060001-004_00 | Green River-2 | | RIVER | 91.402 MILES | Green River from Duchesne River confluence to Utah-Wyoming border | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060002-001_00 | Lower Ashley Creek | | RIVER | 8.097 MILES | Ashley Creek and tributaries from Green River confluence to Vernal sewage lagoons | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 1992 | | • Industrial Point Source Discharge |
| Secondary Recreation | Not Assessed | N | | | | • Municipal Point Source Discharges |
| Warm Water Aquatic Life | Not Supporting | N | Selenium | 1992 | Completed / High Priority | • Natural Sources<br>• Agriculture |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060002-002_00 | Middle Ashley Creek | | RIVER | 12.282 MILES | Ashley Creek and tributaries from Vernal sewage lagoons to Dry Fork confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2008 | Low Priority | • Natural Sources<br>• Agriculture |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Selenium | 2008 | Low Priority | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060002-003_00 | Brush Creek | | RIVER | 22.739 MILES | Brush Creek and tributaries from confluence with Green River to Red Fleet Dam but excluding Little Brush Creek | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Selenium | 2006 | Medium Priority | • Natural Sources |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Selenium | 2006 | Medium Priority | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060002-004_00 | Lower Little Brush Creek | | RIVER | 7.979 MILES | Little Brush Creek and tributaries from Big Brush Creek confluence to mouth of Little Brush Creek Gorge | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060002-005_00 | Upper Little Brush Creek | | RIVER | 32.936 MILES | Little Brush Creek and tributaries from mouth of Little Brush Creek Gorge to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060002-006_00 | Big Brush Creek | | RIVER | 42.798 MILES | Big Brush Creek and tributaries from Red Fleet | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060002-007_00 | Upper Ashley Creek | | RIVER | 60.934 MILES | Ashley Creek and tributaries from Dry Fork confluence to headwaters (exclude Dry Fork) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060002-008_00 | Lower Dry Fork Creek | | RIVER | 5.77 MILES | Dry Fork and tributaries from confluence with Ashley Creek to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2008 | Low Priority | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060002-009_00 | Dry Fork Creek Upper | | RIVER | 41.245 MILES | Dry Fork and tributaries from U.S. Forest Service boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-001_00 | Duchesne River-1 | | RIVER | 19.99 MILES | Duchesne River and tributaries from Green River confluence to Uinta River confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2006 | Completed | • Natural Sources<br>• Agriculture |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-002_00 | Duchesne River-2 | | RIVER | 31.593 MILES | Duchesne River and tributaries from confluence with Uinta River to Myton | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2006 | Completed | • Natural Sources<br>• Agriculture |
| Secondary Recreation | Not Assessed | N | | | | • Source Unknown |
| Warm Water Aquatic Life | Not Supporting | N | Temperature, water | 2008 | Low Priority | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT14060003-003_00 | Uinta River-1 | RIVER | 7.25 MILES | Uinta River and tributaries from Duchesne River confluence upstream to Dry Gulch confluence |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-004_00 | Uinta River-2 | | RIVER | 3.15 MILES | Uinta River and tributaries from Dry Gulch confluence upstream to U.S. Highway 40 | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 1998 | Completed | • Natural Sources<br>• Agriculture |
| Secondary Recreation | Not Assessed | N | | | | • Habitat Modification - other than Hydromodification |
| Warm Water Aquatic Life | Not Supporting | N | Physical substrate habitat alterations | | Pollution | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-005_00 | Antelope Creek | | RIVER | 31.574 MILES | Antelope Creek and tributaries from Duchesne River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Supporting | N | Boron<br>Total Dissolved Solids | 2008<br>1998 | Low Priority<br>High Priority | • Natural Sources<br>• Agriculture |
| Cold Water Aquatic Life | Fully Supporting | N | | | | • Habitat Modification - other than Hydromodification |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-006_00 | Duchesne River-3 | | RIVER | 39.455 MILES | Duchesne River from Myton to Strawberry River confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-007_00 | Zimmerman Wash | | RIVER | 0.051 MILES | Zimmerman Wash from confluence with Lake Fork River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-008_00 | Lake Fork-1 | | RIVER | 19.643 MILES | Lake Fork River and tributaries from Duchesne River confluence to Pigeon Water Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-009_00 | Dry Gulch Creek | | RIVER | 88.101 MILES | Dry Gulch Creek and tributaries from Duchesne River confluence to headwaters | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 1998 | Completed | • Natural Sources<br>• Agriculture |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-010_00 | Uinta River-3 | | RIVER | 64.161 MILES | Uinta River and tributaries from U.S. Highway 40 to USFS boundary, excluding all of Whiterocks River and Farm, Pole, and Deep Creeks | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Other flow regime alterations | | Pollution | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | Physical substrate habitat alterations | | Pollution | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-011_00 | Lower Whiterocks River | | RIVER | 23.807 MILES | Whiterocks River and tributaries from confluence with Uintah River to Tridell Water Treatment Plant | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

## Assessment Results for Uinta Basin Stream Assessment Units

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT14060003-012_00 | Deep Creek | | RIVER | 24.858 MILES | Deep Creek and tributaries from Uintah River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT14060003-013_00 | Upper Whiterocks River | | RIVER | 76.306 MILES | Whiterocks River and tributaries from Tridell Water Treatment Plant to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-014_00 | Pole Creek | | RIVER | 34.861 MILES | Pole and Farm Creeks and their tributaries from their Uinta River confluence to headwaters, and Cart Hollow above USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-015_00 | Lake Fork-2 | | RIVER | 31.676 MILES | Lake Fork River and tributaries from Pigeon Water Creek confluence to Yellowstone River confluence (includes Pigeon Water Creek and Yellowstone River to USFS boundary) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Physical substrate habitat alterations | | Pollution | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-016_00 | Lower Rock Creek | | RIVER | 29.286 MILES | Rock Creek and tributaries from confluence with Duchesne River to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-017_00 | Duchesne River-4 | | RIVER | 67.497 MILES | Duchesne River and tributaries from Strawberry River confluence to West Fork Duchesne River | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | confluence, excluding Rock Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-018_00 | West Fork Duchesne | | RIVER | 67.722 MILES | West Fork Duchesne River and tributaries from confluence with Duchesne River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-019_00 | North Fork Duchesne | | RIVER | 58.319 MILES | North Fork Duchesne River and tributaries from Duchesne River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-020_00 | Upper Rock Creek | | RIVER | 99.362 MILES | Rock Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-021_00 | Tributaries to Moon Lake. | | RIVER | 118.35 MILES | Moon Lake tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-022_00 | Lake Fork-3 | | RIVER | 35.734 MILES | Lake Fork River and tributaries from Yellowstone River confluence to Moon Lake | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-023_00 | Upper Yellowstone | | RIVER | 110.838 MILES | Yellowstone River and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060003-024_00 | Uinta River-4 | | RIVER | 85.836 MILES | Uinta River and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-001_00 | Strawberry River-1 | | RIVER | 5.941 MILES | Strawberry River from confluence with Duchesne River to Starvation Dam | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Boron | 2010 | Low Priority | • Source Unknown |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-002_00 | Indian Canyon Creek | | RIVER | 44.01 MILES | Indian Canyon Creek and tributaries from Strawberry River confluence to headwaters | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Boron<br>Total Dissolved Solids | 2008<br>1998 | Low Priority<br>High Priority | • Source Unknown<br>• Natural Sources |
| Cold Water Aquatic Life | Fully Supporting | N | | | | • Agriculture |
| Domestic Water Supply | Not Supporting | N | Arsenic | 2008 | Low Priority | • Habitat Modification - other than Hydromodification |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-003_00 | Starvation Tribs | | RIVER | 0.62 MILES | Starvation Reservoir tributaries except Strawberry River | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-004_00 | Stawberry River-2 | | RIVER | 16.359 MILES | Strawberry River and tributaries from Starvation Reservoir to Avintaquin Creek confluence, excluding Red Creek and tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-005_00 | Avintaquin Creek | | RIVER | 53.837 MILES | Avintaquin Creek and tributaries from Strawberry River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Not Supporting | N | Arsenic | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-006_00 | Lower Red Creek | | RIVER | 5.202 MILES | Red Creek and tributaries from Strawberry River confluence to Currant Creek Confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-007_00 | Middle Red Creek | | RIVER | 14.779 MILES | Red Creek and tributaries from Current Creek confluence to Red Creek Reservoir | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-008_00 | Upper Red Creek | | RIVER | 15.886 MILES | Red Creek Reservoir tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-009_00 | Lower Currant Creek | | RIVER | 60.569 MILES | Current Creek and tributaries from Red Creek confluence to Current Creek Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-010_00 | Strawberry River-3 | | RIVER | 20.164 MILES | Strawberry River and tributaries, except Willow Creek and Timber Canyon, from Avintaquin Creek confluence to Strawberry Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT14060004-011_00 | Timber Canyon Creek | | RIVER | 15.675 MILES | Timber Canyon Creek and tributaries from confluence with Strawberry River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-012_00 | Willow Creek | | RIVER | 17.928 MILES | Willow Creek and tributaries from confluence with Strawberry River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-013_00 | Strawberry-4 | | RIVER | 68.196 MILES | Strawberry Reservoir tributaries other than Strawberry River | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-014_00 | Upper Strawberry | | RIVER | 38.016 MILES | Strawberry River and tributaries from Strawberry Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060004-015_00 | Upper Currant Creek | | RIVER | 55.468 MILES | Currant Creek Reservoir tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060005-001_00 | Green River-3 Tribs | | RIVER | 0.114 MILES | Green River tributaries from Price River to Duchesne River (HUC 14060005) not spefically defined | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060005-002_00 | Pariette Draw Creek | | RIVER | 54.096 MILES | Pariette Draw Creek and tributaries from Green River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Boron<br>Total Dissolved Solids | 1998<br>1998 | High Priority<br>High Priority | • Natural Sources |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | • Agriculture<br>• Habitat Modification - other than Hydromodification<br>• Irrigated Crop Production<br>• Livestock (Grazing or Feeding Operations) |
| Warm Water Aquatic Life | Not Supporting | N | Selenium | 1998 | High Priority | |
| Wildlife Habitat | Not Supporting | N | Selenium | 1998 | High Priority | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060005-003_00 | Ninemile Creek | | RIVER | 119.076 MILES | Ninemile Creek and tributaries from Green River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Habitat Modification - other than Hydromodification |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 1998 | High Priority | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060005-004_00 | Upper Range Creek | | RIVER | 6.385 MILES | Range Creek and tributaries from Range Creek Pumping Station to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT14060005-005_00 | Middle Range Creek | | RIVER | 19.393 MILES | Range Creek and tributaries from ranch diversion to Range Creek Pumping Station | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060005-006_00 | Lower Range Creek | | RIVER | 8.975 MILES | Range Creek and tributaries from confluence with Green River to ranch diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060005-007_00 | Florence Creek | | RIVER | 16.604 MILES | Florence Creek and tributaries from Green River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060005-008_00 | Rock Creek | | RIVER | 0.01 MILES | Rock Creek from Green River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060005-009_00 | Green River-3 | | RIVER | 111.839 MILES | Green River from Price River confluence to Duchesne | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | River confluence (Green River in HUC 14060005) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060006-001_00 | Willow Creek | | RIVER | 57.177 MILES | Willow Creek and tributaries from Geen River confluence to Meadow Creek confluence (excluding Hill Creek) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060006-002_00 | Upper Willow Creek | | RIVER | 123.165 MILES | Willow Creek and tributaries from, and including, Meadow Creek confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Uinta Basin Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14060006-003_00 | Hill Creek | | RIVER | 82.024 MILES | Hill Creek and tributaries from Willow Creek confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

**Table 7-6 Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit**

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14060002-001 | Ashley Twin Lakes | 2 | 2 | | | | | | | | N | FS | FS | FS | FS | FS |
| UT-L-14040106-031 | Beaver Meadow Reservoir | 2 | 2 | | | | | | ND | | N | FS | FS | FS | FS | FS |
| UT-L-14060003-230 | Big Sand Wash Reservoir | 3B | 5 | DO, T | NS | FS | NS | | No | | Y | FS | NS | FS | NS | NS |

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14040107-004 | Bridger Lake | 5B | 5 | DO | FS | FS | FS | | No | DO | Y | NS | NS | NS | NS | FS |
| UT-L-14060001-002 | Brough Reservoir | 5 | 5 | T, DO | NS | FS | NS | | No | | Y | NS | NS | NS | NS | NS |
| UT-L-14040106-019 | Browne Lake | 4 | 4 | DO | FS | FS | FS | | No | | Y | NS | FS | FS | NS | FS |
| UT-L-16020101-010 | Butterfly Lake | 2 | 2 | | | | | | Y | | Y | FS | FS | FS | FS | |

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14040106-034 | Calder Reservoir | 4 | 3B | DO | NS | NS | FS | | TP, TSI | DO/FK | Y | NS | NS | NS | NS | NS |
| UT-L-14040107-006 | China Lake | 5B | 5 | T, DO | | | | | No | DO/FK | Y | NS | FS | FS | NS | |
| UT-L-14060004-007 | Currant Creek Reservoir | 2 | 2 | | FS | FS | FS | | No | | Y | FS | FS | FS | FS | FS |
| UT-L-14060002-005 | East Park Reservoir | 2 | 2 | | FS | FS | FS | | No | | Y | FS | FS | FS | FS | FS |

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010 | | | | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | Assessment Cycle | | | | |
| | | | | | DO | pH | T | Other | | | | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14040106-021 | Flaming Gorge Reservoir | 2 | 2 | | FS | FS | FS | | No | | Y | FS | FS | FS | FS | FS |
| UT-L-14040106-001 | Hoop Lake | 2 | 2 | | | | | | | | Y | FS | FS | FS | FS | |
| UT-L-14060003-012 | Hoover Lake | 2 | 2 | | | | | | | | Y | FS | FS | FS | FS | |
| UT-L-14060002-002 | Long Park Reservoir | 2 | 2 | | FS | FS | FS | | No | | Y | FS | FS | FS | FS | FS |

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14040107-005 | Lyman Lake | 5 | 5 | DO | | | | | No | DO | Y | NS | NS | NS | NS | |
| UT-L-14040107-003 | Marsh Lake | 5 | 5 | DO | FS | FS | FS | | No | DO/FK | Y | NS | NS | NS | NS | FS |
| UT-L-14060003-011 | Marshall Reservoir | 2 | 2 | | | | | | | DO/FK | Y | NS | NS | NS | FS | |
| UT-L-14040106-033 | Matt Warner Reservoir | 4 | 4 | pH, T | FS | FS | FS | | TP | DO/FK | N | NS | FS | NS | NS | FS |

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010 | | | | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | Assessment Cycle | | | | |
| | | | | | DO | pH | T | Other | | | | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14040107-001 | Meeks Cabin Reservoir | 2 | 2 | | FS | FS | FS | | | | N | FS | FS | FS | FS | FS |
| UT-L-14060003-006 | Mirror Lake | 4 | 2 | | FS | FS | FS | | No | DO | Y | NS | FS | FS | | FS |
| UT-L-14060003-112 | Moon Lake | 2 | 2 | | | | | | | | N | FS | FS | FS | FS | |
| UT-L-14060002-003 | Oak Park Reservoir | 2 | 2 | | FS | FS | FS | | No | | N | FS | FS | FS | FS | FS |

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14060003-297 | Paradise Park Reservoir | 2 | 2 | | | | | | | | N | FS | FS | FS | FS | |
| UT-L-14060001-001 | Pelican Lake | 5 | 5 | pH | FS | FS | NS | | No | FK | Y | NS | NS | NS | NS | NS |
| UT-L-14060004-003 | Red Creek Reservoir | 2 | 2 | FS | FS | FS | FS | | No | | Y | FS | FS | FS | FS | FS |
| UT-L-14060002-006 | Red Fleet Reservoir | 5 | 3B | DO | NS | NS | FS | | No | | Y | NS | NS | NS | NS | NS |

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16020101-008 | Scout Lake | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |
| UT-L-14040106-016 | Sheep Creek Reservoir | 5 | 5 | FS | | | | | | | Y | FS | FS | FS | FS | |
| UT-L-14040106-002 | Spirit Lake | 4 | 4 | FS | | | | | | | N | NS | FS | FS | | |
| UT-L-14060004-006 | Starvation Reservoir | 5 | 5 | DO | NS | FS | FS | | | | Y | NS | NS | NS | NS | NS |

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14040107-007 | Stateline Reservoir | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |
| UT-L-14060002-004 | Steinaker Reservoir | 5 | 5 | 5 for T, 4 for DO | FS | NS | FS | | No | | Y | NS | NS | NS | NS | NS |
| | Stewart Lake | NA | 3A | | | | | Se | | | | | | | | NS |
| UT-L-14060004-001 | Strawberry Reservoir | 4 | 4 | DO | | | | | No | DO | Y | NS | NS | NS | NS | |

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14060003-296 | Upper Stillwater Reservoir | 2 | 2 | FS | | | | | | | Y | FS | FS | FS | FS | |

| Summary of Individual Lake and Reservoir Support for Uinta Basin Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |

**Notes:**

FS Fully Supporting

NS Not Supporting

Y Yes

N No

DO Dissolved Oxygen

FK Fish Kill

T Temperature

Total P Total Phosphorus

NA Not Analyzed

**Table 7-7 Individual Lake and Reservoir 2010 Trophic State Index (TSI) – Uinta Watershed Management Unit**

| Individual Lake and Reservoir 2010 Trophic State Index (TSI)<br>Uinta Watershed Management Unit | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Uinta Basin | UT-L-14060003-230 | Big Sand Wash Reservoir | 7/17/2007 | 42 | | |
| Uinta Basin | UT-L-14040107-004 | Bridger Lake | 7/19/2007 | 37 | 39 | 42 |
| Uinta Basin | UT-L-14060001-002 | Brough Reservoir | 7/12/2007 | 37 | 36 | 53 |
| Uinta Basin | UT-L-14040106-019 | Browne Reservoir | 7/19/2007 | 46 | 43 | 37 |
| Uinta Basin | UT-L-14040106-034 | Calder Reservoir | 8/7/2007 | 69 | 61 | 49 |
| Uinta Basin | UT-L-14060004-007 | Currant Creek Reservoir | 8/14/2007 | 40 | 8 | 37 |
| Uinta Basin | UT-L-14060002-005 | East Park Reservoir | 7/11/2007 | 52 | | 37 |
| Uinta Basin | UT-L-14040106-032 | Flaming Gorge Reservoir | 6/21/2007 | 29 | -15 | 49 |
| Uinta Basin | UT-L-14040106-032 | Flaming Gorge Reservoir | 8/30/2007 | 36 | 30 | 37 |
| Uinta Basin | UT-L-14040106-032 | Flaming Gorge Reservoir | 5/12/2008 | 42 | 33 | 37 |

| Individual Lake and Reservoir 2010 Trophic State Index (TSI)<br>Uinta Watershed Management Unit | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Uinta Basin | UT-L-14040106-032 | Flaming Gorge Reservoir | 7/23/2008 | | 30 | 37 |
| Uinta Basin | UT-L-14040106-032 | Long Park Reservoir | 7/19/2007 | 53 | 45 | 37 |
| Uinta Basin | UT-L-14040107-003 | Marsh Lake | 8/28/2007 | 38 | 32 | 37 |
| Uinta Basin | UT-L-14040106-033 | Matt Warner Reservoir | 8/7/2007 | 68 | 18 | |
| Uinta Basin | UT-L-14060003-006 | Mirror Lake | 8/28/2007 | 38 | 34 | 37 |
| Uinta Basin | UT-L-14060002-003 | Oak Park Reservoir | 8/30/2007 | 53 | 8 | 37 |
| Uinta Basin | UT-L-14060001-001 | Pelican Lake | 6/21/2007 | 37 | 31 | 52 |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 5/23/2007 | 57 | 40 | 37 |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 6/12/2007 | 46 | 36 | 37 |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 7/10/2007 | 54 | 41 | 37 |

| Individual Lake and Reservoir 2010 Trophic State Index (TSI)<br><br>Uinta Watershed Management Unit | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 7/12/2007 | 47 | 36 | 37 |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 8/7/2007 | 52 | 38 | 37 |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 9/6/2007 | 53 | 42 | 37 |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 5/19/2008 | 56 | 38 | 37 |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 6/10/2008 | 53 | 41 | 37 |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 7/22/2008 | 55 | 34 | 37 |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 8/20/2008 | | 41 | 37 |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 9/23/2008 | 45 | 39 | 37 |
| Uinta Basin | UT-L-14060004-006 | Starvation Reservoir | 5/23/2007 | 37 | 32 | 45 |
| Uinta Basin | UT-L-14060004-006 | Starvation Reservoir | 7/10/2007 | 37 | 33 | 42 |

| Individual Lake and Reservoir 2010 Trophic State Index (TSI)<br>Uinta Watershed Management Unit | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Uinta Basin | UT-L-14060002-004 | Steinaker Reservoir | 7/11/2007 | 46 | | 37 |
| Uinta Basin | UT-L-14060004-001 | Strawberry Reservoir | 8/6/2007 | 37 | 8 | |

Notes:

TSI-SD = Trophic State Index from secchi disk

TSI-Chla = Trophic State Index from chlorophyll-a

TSI-TP = Trophic State Index from total phosphorus

**Table 7-8 Summary of Individual Lake and Reservoir Trophic State Index (TSI) – Uinta Watershed Management Unit**

| Summary of Individual Lake and Reservoir Trophic State Index (TSI)<br>Uinta Watershed Management Unit | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Uinta Basin | UT-L-14060003-230 | Big Sand Wash Reservoir | 46 | 45 | 39 | 39 | 41 | 48 | 33 | NA | 42 | 42 | M | M |
| Uinta Basin | UT-L-14040107-004 | Bridger Lake | | 47 | 52 | 47 | 46 | 45 | 43 | 48 | 40 | 39 | M | O |
| Uinta Basin | UT-L-14060001-002 | Brough Reservoir | | | 45 | 42 | 41 | NA | 49 | 49 | 42 | 36 | M | O |
| Uinta Basin | UT-L-14040106-019 | Browne Lake | 40 | 45 | 47 | 50 | 51 | NA | 51 | 47 | 42 | 43 | M | M |
| Uinta Basin | UT-L-14040106-034 | Calder Reservoir | | 54 | 59 | 60 | 59 | 58 | 55 | 60 | 60 | 61 | E | E |

| Summary of Individual Lake and Reservoir Trophic State Index (TSI)<br>Uinta Watershed Management Unit | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Uinta Basin | UT-L-14040107-006 | China Lake | | 46 | 35 | 45 | 49 | 44 | 45 | 54 | 47 | 47 | M | M |
| Uinta Basin | UT-L-14060004-007 | Currant Creek Reservoir | 44 | 42 | 38 | 41 | 44 | 45 | 32 | 42 | 28 | 8 | O | O |
| Uinta Basin | UT-L-14060002-005 | East Park Reservoir | | 48 | 41 | 46 | 47 | 44 | 37 | 45 | 45 | 52 | M | M |
| Uinta Basin | UT-L-14040106-032 | Flaming Gorge Reservoir | 43 | | 36 | 37 | 40 | 32 | 36 | NA | 31 | 19 | O | O |
| Uinta Basin | UT-L-14040106-032 | Long Park Reservoir | | 45 | 45 | 42 | DRY | DRY | 34 | 48 | 45 | 45 | M | M |

| Summary of Individual Lake and Reservoir Trophic State Index (TSI)<br>Uinta Watershed Management Unit | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Uinta Basin | UT-L-14040107-003 | Marsh Lake | 28 | 34 | 30 | 31 | 37 | 41 | 31 | 42 | 36 | 32 | O | O |
| Uinta Basin | UT-L-14040106-033 | Matt Warner Reservoir | | 53 | 61 | 56 | 57 | 53 | 54 | 58 | 43 | 18 | M | O |
| Uinta Basin | UT-L-14060003-006 | Mirror Lake | 38 | 40 | 32 | 38 | 43 | 41 | 38 | NA | 37 | 34 | O | O |
| Uinta Basin | UT-L-14060002-003 | Oak Park Reservoir | 49 | 48 | 42 | 45 | 45 | 46 | 42 | 33 | 33 | 8 | O | O |
| Uinta Basin | UT-L-14060001-001 | Pelican Lake | 45 | 39 | 47 | 41 | 38 | 35 | 46 | 37 | 40 | 31 | M | O |

| Summary of Individual Lake and Reservoir Trophic State Index (TSI)<br>Uinta Watershed Management Unit | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Uinta Basin | UT-L-14060002-006 | Red Fleet Reservoir | 42 | 40 | 41 | 46 | 40 | NA | 38 | 44 | 42 | 39 | M | O |
| Uinta Basin | UT-L-14060004-006 | Starvation Reservoir | 55 | 41 | 37 | 40 | 39 | 39 | 43 | 43 | 38 | 32 | O | O |
| Uinta Basin | UT-L-14060002-004 | Steinaker Reservoir | 35 | 40 | 34 | 35 | 38 | 37 | 37 | 40 | 42 | 37 | M | O |
| Uinta Basin | UT-L-14060004-001 | Strawberry Reservoir | 56 | 53 | 48 | 46 | 46 | 48 | 44 | 37 | 22 | 8 | O | O |

**Summary of Individual Lake and Reservoir Trophic State Index (TSI)**

**Uinta Watershed Management Unit**

| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |

Notes:

2010 Old Method TSI calculated using the 2008 Integrated Report Methodology

2010 Current Method TSI calculated using the 2010 Integrated Report Methodology of only chlorophyll-a

O = Oligotrophic

M = Mesotrophic

E = Eutrophic

H = Hypereutrophic

# Figures

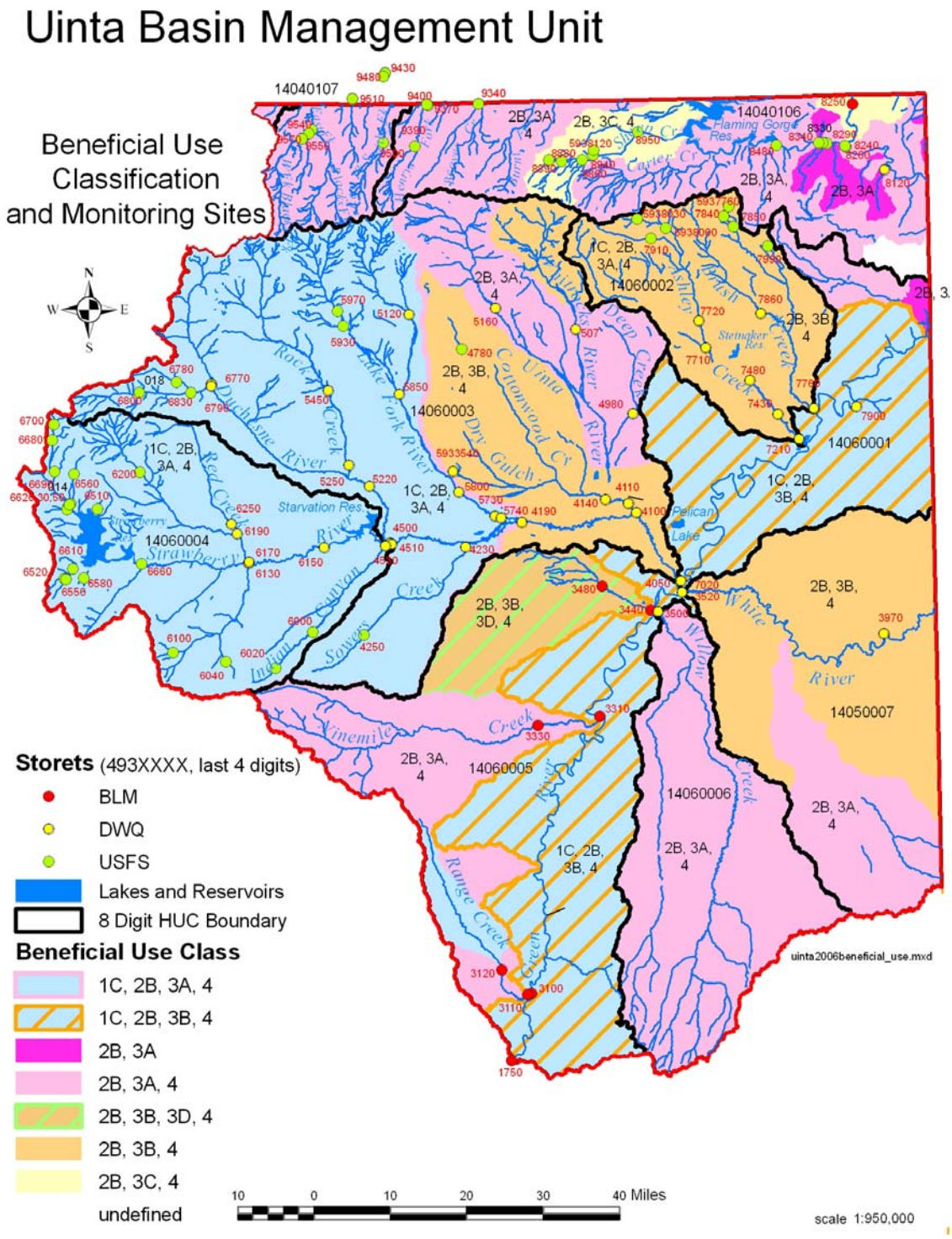


**Figure 7-1 Beneficial Use Classifications for Uinta Basin Watershed Management Unit**

# CHAPTER 8: SEVIER RIVER WATERSHED MANAGEMENT UNIT ASSESSMENT

## 8.1. INTRODUCTION

The Sevier River Watershed Management Unit includes all streams located in the USGS Hydrological Units (HUCs) listed in Table 8-1. Some of the major streams within unit are the Sevier River, San Pitch River, Otter Creek, Salina Creek, and the East Fork Sevier River.

Biological, water chemistry and field data collected from January 1, 2004 through December 31, 2008 were used to make assessments. Water quality data were compared against standards established for each of the designated beneficial uses. Figure 8-1 shows the beneficial use classifications for this watershed.

## 8.2 IMPAIRED WATERS

The list of streams and lakes impaired and requiring a TMDL (Category 5; Section 303d) for the Sevier River Watershed are presented in Table 8-2. New listings for 2010 include East Fork Sevier-3, Sevier River-20, Parowan Creek, Navajo Lake, Piute Reservoir, and Koosharem Reservoir. No lakes or streams are being removed from the 303d list this assessment cycle. Assessment results for all AUs for streams are presented in Table 8-3 and for lakes in Table 8-4. Lake assessments are further discussed in the next section.

## 8.3 LAKE ASSESSMENTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends.

Table 8-5 shows TSIs based on each sample collected from May through September by sample date. Table 8-6 contains a summary of lake trophic status by study periods. Note that some of the changes in TSIs between assessment periods is due to the variability in the lakes and reservoirs and some is due to switching methodologies between 2008 and 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). Table 8-6 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. Medium differences were observed for Piute Reservoir and large differences were observed for Koosharem Reservoir. The lack of significant differences suggests little difference in trophic state between the new and older methods for most lakes.

Koosharem Reservoir changed from mesotrophic in the 2008 IR to oligotrophic in 2010 with TSIs of 57 and 25, respectively. Using the 2008 IR method for calculating the TSI, the reservoir would remain classified as mesotrophic for 2010 with a TSI of 52. This indicates that the reduction in trophic classification is an artifact of changing the methodology between 2008 and 2010. Koosharem Reservoir is on the 303d list for total phosphorus and total phosphorus is elevated at 0.15 µg/L. As shown in Table 8-6, TSI-SD is much higher, and to a lesser extent

TSI-TP, when compared to TSI-Chla. This suggests, along with the fully-supporting parameter of pH, that an oligotrophic classification is appropriate for Koosharem Reservoir.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. Consistent trends that resulted in a net TSI change of five or changes greater than 10 between 2008 and 2010, which are not attributable to the change in TSI methodology alone, are identified. Lower Box Creek Reservoir exhibits a decreasing trend for TSI.

## 8.4 HEALTH ADVISORIES

The East Fork of the Sevier River has a fish consumption advisory for mercury.

# TABLES

**Table 8-1 Hydrological Unit Codes and Names**

| Hydrological Unit Codes and Names | |
|---|---|
| **Hydrological Unit Code** | **Hydrological Unit Name** |
| 16030001 | Upper Sevier |
| 16030002 | East Fork Sevier |
| 16030003 | Middle Sevier |
| 16030004 | San Pitch |
| 16030005 | Lower Sevier |
| 16030009 | Sevier Lake |

**Table 8-2 Impaired Streams and Lakes Requiring a TMDL – Sevier River Watershed**

| Impaired Streams and Lakes Requiring a TMDL - Sevier River Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030001-002_00 | Sevier River-4 | RIVER | 16.208 MILES | Sevier River and tributaries from Piute Reservoir to Circleville Irrigation Diversion, excluding East Fork Sevier River and tributaries |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |

| Impaired Streams and Lakes Requiring a TMDL - Sevier River Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030001-005_00 | Sevier River-3 | RIVER | 20.66 MILES | Sevier River and tributaries from Circleville Irrigation Diversion to Horse Valley Diversion |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030001-012_00 | Sevier River-1 | RIVER | 28.607 MILES | Sevier River and tributaries from Long Canal to Mammoth Creek confluence |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030001-013_00 | Piute | RIVER | 4.036 MILES | Piute Reservoir tributaries below USFS boundary and excluding Sevier River inlet |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |

| Impaired Streams and Lakes Requiring a TMDL - Sevier River Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030001-014_00 | Threemile Creek | RIVER | 19.91 MILES | Threemile Creek and other Sevier River west side tributaries from Horse Valley Diversion upstream to Long Canal, excluding Panquitch and Bear Creeks |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030002-001_00 | Otter Creek-4 | RIVER | 18.583 MILES | Otter Creek and tributaries from Koosharem Reservoir to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030002-002_00 | Otter Creek-1 | RIVER | 59.82 MILES | Otter Creek and tributaries from Otter Creek Reservoir to Koosharem Reservoir, except Box and Greenwich Creeks |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |

| Impaired Streams and Lakes Requiring a TMDL - Sevier River Watershed | | | | |
|---|---|---|---|---|
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030002-005_00 | East Fork Sevier River-4 | RIVER | 25.741 MILES | East Fork Sevier River and tributaries from confluence with Sevier River upstream to Antimony Creek confluence, excluding Otter Creek and tributaries |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2006 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030002-006_00 | East Fork Sevier-3 | RIVER | 21.292 MILES | East Fork Sevier River and tributaries from Antimony Creek confluence to Deer Creek confluence |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030003-017_00 | Sevier River-6 | RIVER | 28.062 MILES | Sevier River from Clear Creek confluence to HUC unit 1603003-1603001 boundary |

| Impaired Streams and Lakes Requiring a TMDL - Sevier River Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2006 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030004-009_00 | San Pitch-5 | RIVER | 65.657 MILES | San Pitch River and tributaries from U-132 to Pleasant Creek confluence, excluding Cedar Creek, Oak Creek, Pleasant Creek and Cottowood Creek |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown<br>• Natural Sources |
| Temperature, water | 2006 | Medium Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030005-022_00 | Chicken Creek-2 | RIVER | 24.51 MILES | Chicken Creek and tributaries from confluence with Sevier River to Levan |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Total Dissolved Solids | 1998 | High Priority | Agricultural | • Hydromodification<br>• Natural Sources |

| Impaired Streams and Lakes Requiring a TMDL - Sevier River Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030005-025_00 | Sevier River-20 | RIVER | 34.432 MILES | Sevier River from U-132 crossing at the northern most point of the Sevier River (near Dog Valley Wash confluence) upstream to Yuba Dam |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Warm Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030005-028_00 | Sevier River-25 | RIVER | 18.664 MILES | Sevier River from Crafts Lake to Gunnison Bend Reservoir |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Boron | 2008 | Low Priority | Agricultural | • Natural Sources |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030006-004_00 | Parowan Creek | STREAM | 1 MILES | Parowan |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Cold Water Aquatic Life | • Source Unknown |

| Impaired Streams and Lakes Requiring a TMDL - Sevier River Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030001-001_00 | Navajo Lake | FRESHWATER LAKE | 714 ACRES | LL= 373118/1124536 38S 8,9W 8,7,9,12 USGS MAP AND DATE: CEDAR BREAKS, UTAH-1958, WMU Sevier River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved<br><br>pH | 2006<br><br>2010 | Low Priority<br><br>Low Priority | Cold Water Aquatic Life<br><br>Cold Water Aquatic Life | • Grazing in Riparian or Shoreline Zones<br>• Managed Pasture Grazing<br>• Other Recreational Pollution Sources<br>• Rangeland Grazing |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030001-011_00 | Piute Reservoir | FRESHWATER RESERVOIR | 2508 ACRES | LL= 381722/1121226 28,29S 2,3N 3,4,9,10,16,17,21,22,27,28,34 USGS MAP AND DATE: MARYSVALE, UTAH 1945 WATERSHED: SEVIER RIVER |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water<br><br>Phosphorus (Total) | 2010<br><br>2006 | Low Priority<br><br>Low Priority | Cold Water Aquatic Life<br><br>Cold Water Aquatic Life | • Aquaculture (Permitted)<br>• Managed Pasture Grazing<br>• Other Recreational Pollution Sources |

| Impaired Streams and Lakes Requiring a TMDL - Sevier River Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030002-004_00 | Otter Creek Reservoir | FRESHWATER RESERVOIR | 2520 ACRES | LL= 381252/1115917 29,30S 2W 10,11,12,14,15,21,22,27,28,35,36 USGS MAP AND DATE: PHONOLITE HILL, UTAH 1971, ANGLE,UTAH 1970 WATERSHED: OTTER CREEK, WMU Sevier River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water<br>pH | 1994<br>2006 | Low Priority<br>Low Priority | Cold Water Aquatic Life<br>Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030002-011_00 | Koosharem Reservoir | FRESHWATER LAKE | 310 ACRES | LL= 383505/1115008 25S 1E 19,30,31 USGS MAP AND DATE: BURRVILLE, UTAH-1968 WATERSHED: OTTER CREEK, WMU Sevier River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water<br>Phosphorus (Total) | 2010<br>1992 | Low Priority | Cold Water Aquatic Life<br>Cold Water Aquatic Life | • Managed Pasture Grazing<br>• Other Recreational Pollution Sources<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL - Sevier River Watershed | | | | |
|---|---|---|---|---|
| UT-L-16030003-006_00 | Manning Meadow Reservoir | FRESHWATER LAKE | 59 ACRES | TOWNSHIP: 27S RANGE: 2.5W SECTION: 1 USGS MAP AND DATE: MARYSVALE, UTAH-9145 WATERSHED: MANNING CREEK, WMU Sevier River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | Low Priority | Cold Water Aquatic Life | • Managed Pasture Grazing<br>• Rangeland Grazing |
| Phosphorus (Total) | 1994 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030004-001_00 | Ninemile Reservoir | FRESHWATER LAKE | 197 ACRES | LL= 391030/1114230 19S 2E 8,9 USGS MAP AND DATE: STERLING, UTAH-1966 WATERSHED: HIGHLAND CANAL, WMU Sevier River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | Low Priority | Cold Water Aquatic Life | • Grazing in Riparian or Shoreline Zones |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Other Recreational Pollution Sources<br>• Rangeland Grazing |
| pH | 2008 | Low Priority | Cold Water Aquatic Life | • Silviculture Plantation Management |
| Phosphorus (Total) | 2006 | Low Priority | Cold Water Aquatic Life | |

| Impaired Streams and Lakes Requiring a TMDL - Sevier River Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030004-005_00 | Palisade Lake | FRESHWATER LAKE | 66 ACRES | LL= 391200/1114030 18S 2E 34,35 USGS MAP AND DATE: STERLING, UTAH-1966 WATERSHED: LAKE CANAL, WMU |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 1992 | Low Priority | Cold Water Aquatic Life | • Source Unknown |

**Table 8-3 Assessment Results for Sevier River Watershed Stream Assessment Units**

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-001_00 | Piute West | | RIVER | 7.524 MILES | Piute Reservoir west side tributaries (City Creek) above USFS boundary and south of HUC boundary 16030003 | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-002_00 | Sevier River-4 | | RIVER | 16.208 MILES | Sevier River and tributaries from Piute Reservoir to Circleville Irrigation Diversion, excluding East Fork Sevier River and tributaries | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-004_00 | Bear Creek | | RIVER | 5.582 MILES | Bear Creek and tributaries from confluence with Sevier River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-005_00 | Sevier River-3 | | RIVER | 20.66 MILES | Sevier River and tributaries from Circleville Irrigation Diversion to Horse Valley Diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Aquaculture (Permitted)<br>• Agriculture |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation<br>Temperature, water | 2006<br><br>2006<br>2008 | Completed<br>Pollution<br>Completed<br>Low Priority | • Habitat Modification - other than Hydromodification<br>• Hydromodification |
| Secondary Recreation | Not Assessed | N | | | | • Source Unknown |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT16030001-006_00 | Panguitch Creek-2 | | RIVER | 23.255 MILES | Panguitch Creek and tributaries from confluence with Sevier River to Panguitch Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-007_00 | Sevier River-2 | | RIVER | 46.99 MILES | Sevier River and east side tributaries from Horse Valley Bridge Diversion upstream to Long Canal | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Aquaculture (Permitted) |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br><br>2006 | Completed<br>Pollution<br>Completed | • Agriculture<br>• Habitat Modification - other than Hydromodification<br>• Hydromodification |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16030001-008_00 | Panguitch Creek-1 | RIVER | 30.012 MILES | Panguitch Creek and tributaries and all other tributaries to Panguitch Reservoir to headwaters |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-009_00 | Mammoth Creek Lower | | RIVER | 22.2 MILES | Mammoth Creek and tributaries from confluence with Sevier River to Mammoth Spring confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total) | 2008 | Completed | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-010_00 | Duck Creek | | RIVER | 2.84 MILES | Duck Creek and tributaries from mouth to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-011_00 | Asay Creek | | RIVER | 36.822 MILES | Asay Creek and tributaries from confluence with Sevier River to Headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-012_00 | Sevier River-1 | | RIVER | 28.607 MILES | Sevier River and tributaries from Long Canal to Mammoth Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Aquaculture (Permitted)<br>• Agriculture |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Sedimentation/Siltation<br>Temperature, water | 2006<br>2006<br>2008 | Completed<br>Completed<br>Low Priority | • Habitat Modification - other than Hydromodification<br>• Hydromodification |
| Secondary Recreation | Not Assessed | N | | | | • Source Unknown |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT16030001-013_00 | Piute | | RIVER | 4.036 MILES | Piute Reservoir tributaries below USFS boundary and excluding Sevier River inlet | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-014_00 | Threemile Creek | | RIVER | 19.91 MILES | Threemile Creek and other Sevier River west side tributaries from Horse Valley Diversion upstream to Long Canal, excluding Panquitch and Bear Creeks | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2008 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030001-015_00 | Mammoth Creek Upper | | RIVER | 21.894 MILES | Mammoth Creek and tributaries from confluence with Mammoth Spring to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

## Assessment Results for Sevier River Watershed Stream Assessment Units

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16030002-001_00 | Otter Creek-4 | RIVER | 18.583 MILES | Otter Creek and tributaries from Koosharem Reservoir to headwaters |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | • Agriculture |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation<br>Temperature, water | 2006<br>Pollution<br>2006<br>2008 | Completed<br>Completed<br>Low Priority | • Habitat Modification - other than Hydromodification<br>• Source Unknown |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16030002-002_00 | Otter Creek-1 | RIVER | 59.82 MILES | Otter Creek and tributaries from Otter Creek Reservoir to Koosharem Reservoir, except Box and Greenwich Creeks |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Grazing in Riparian or Shoreline Zones<br>• Irrigated Crop Production |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation<br>Temperature, water | 2006<br><br>2006<br>2008 | Completed<br>Pollution<br>Completed<br>Low Priority | • Agriculture<br>• Habitat Modification - other than Hydromodification<br>• Hydromodification<br>• Source Unknown |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030002-003_00 | Otter Creek-3 | | RIVER | 23.765 MILES | Greenwich Creek and tributaries from confluence with Otter Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Grazing in Riparian or |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br><br>2006 | Completed<br>Pollution<br>Completed | Shoreline Zones<br>• Irrigated Crop Production<br>• Agriculture<br>• Habitat Modification - other than Hydromodification<br>• Hydromodification |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030002-004_00 | Otter Creek-2 | | RIVER | 19.49 MILES | Box Creek and tributaries from confluence with Otter Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br><br>2006 | Completed<br>Pollution<br>Completed | • Habitat Modification - other than Hydromodification<br>• Hydromodification |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030002-005_00 | East Fork Sevier River-4 | | RIVER | 25.741 MILES | East Fork Sevier River and tributaries from confluence with Sevier River upstream to Antimony Creek confluence, excluding Otter Creek and tributaries | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Temperature, water | 2006<br>2006 | Completed<br>Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT16030002-006_00 | East Fork Sevier-3 | | RIVER | 21.292 MILES | East Fork Sevier River and tributaries from Antimony Creek confluence to Deer Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030002-007_00 | Deer Creek | | RIVER | 17.604 MILES | Deer Creek and tributaries from confluence with East Fork Sevier River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030002-008_00 | Antimony Creek | | RIVER | 26.591 MILES | Antimony Creek and tributaries from confluence with Sevier River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030002-009_00 | East Fork Sevier-2 | | RIVER | 127.668 MILES | East Fork Sevier River and tributaries from Deer Creek confluence to Tropic Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030002-010_00 | East Fork Sevier-1 | | RIVER | 31.8 MILES | East Fork Sevier River and tributaries from Tropic Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Insufficient Information | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-001_00 | Sevier River-19 | | RIVER | 1.131 MILES | Sevier River west side tributaries from Sevier Bridge Dam to Salina Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-002_00 | Willow Creek | | RIVER | 14.07 MILES | Willow Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-003_00 | Salina Creek-1 | | RIVER | 4.71 MILES | Salina Creek and tributaries from confluence with Sevier River to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Supporting | N | Total Dissolved Solids | 1998 | Completed | • Natural Sources<br>• Agriculture<br>• Hydromodification |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16030003-004_00 | Sevier River-16 | RIVER | 0.715 MILES | Sevier River east and west side tributaries from Salina Creek confluence to Rocky Ford Reservoir (excludes Lost Creek) |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-005_00 | Lost Creek-1 | | RIVER | 4.108 MILES | Lost Creek and tributaries from confluence with Sevier River upstream approximately 6 miles | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-006_00 | Salina Creek-2 | | RIVER | 133.939 MILES | Salina Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-007_00 | Beaver Creek-1 | | RIVER | 7.037 MILES | Beaver Creek and other west side tributaries to Sevier River below USFS boundary from Clear Creek upstream to HUC boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-008_00 | Lost Creek-2 | | RIVER | 7.456 MILES | Lost Creek and tributaries from ~6 miles upstream to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-009_00 | Sevier River-11 | | RIVER | 0.003 MILES | Sevier River west side tributaries from the Annabella Diversion upstream to Sevier River confluence with Clear Creek and below USFS boundary | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-010_00 | Lost Creek-3 | | RIVER | 26.681 MILES | Lost Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-011_00 | Sevier River-11 | | RIVER | 12.941 MILES | Sevier River west side tributaries from approximately due West of Salina Creek confluence upstream to Clear Creek confluence and above USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT16030003-012_00 | Sevier River-17 | | RIVER | 45.244 MILES | Sevier River from Yuba Dam upstream to confluence with Salina Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2000 | Completed | • Natural Sources<br>• Agriculture |
| Secondary Recreation | Not Assessed | N | | | | • Hydromodification |
| Warm Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br><br>2006 | Completed<br>Pollution<br>Completed | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-013_00 | Monroe Creek | | RIVER | 57.545 MILES | Sevier River east side tributaries above USFS boundary from Mill Creek-Water Creek area upstream to Durkee Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16030003-014_00 | Sevier River-14 | RIVER | 9.456 MILES | Sevier River east side tributaries from Rocky Ford Reservoir upstream to Annabella Diversion and below USFS boundary |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-015_00 | Sevier River-13 | | RIVER | 28.377 MILES | Sevier River from Rocky Ford Reservoir upstream to Annabella Diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-016_00 | Sevier River-10 | | RIVER | 0.432 MILES | Sevier River east side tributaries below USFS boundary from Anabella Diversion upstream to | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | Clear Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-017_00 | Sevier River-6 | | RIVER | 28.062 MILES | Sevier River from Clear Creek confluence to HUC unit 1603003-1603001 boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2006 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-018_00 | Clear Creek | | RIVER | 101.376 MILES | Clear Creek and tributaries from confluence with Sevier River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT16030003-019_00 | Sevier River-9 | | RIVER | 11.531 MILES | Sevier River from Annabella Diversion to Clear Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-020_00 | Beaver Creek-2 | | RIVER | 16.722 MILES | Beaver Creek and other west side tributaries to Sevier River above USFS boundary from Clear Creek upstream to HUC boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-021_00 | Manning Creek | | RIVER | 13.926 MILES | Manning Creek and tributaries from confluence with Sevier River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-022_00 | Sevier River-5 | | RIVER | 12.509 MILES | Sevier River east side tributaries from Manning Creek confluence to HUC unit boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-023_00 | Sevier River-18 | | RIVER | 26.857 MILES | Sevier River east side tributaries from Sevier Bridge Dam to Salina Creek confluence, excluding San Pitch River and waters above USFS boundary | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-024_00 | Sevier River-15 | | RIVER | 13.202 MILES | Sevier River form confluence with Salina Creek upstream to Rocky Ford Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-025_00 | Sevier River-13 | | RIVER | 4.376 MILES | Sevier River west side tributaries from Rocky Ford Reservoir upstream to Annabella Diversion and below USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT16030003-026_00 | Sevier River-7 | | RIVER | 0 MILES | Sevier River east side tributaries from the Clear Creek confluence upstream to Manning Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030003-027_00 | Peterson Creek | | RIVER | 8.702 MILES | Petersen Creek and tributaries from confluence with Sevier River to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030004-001_00 | San Pitch-1 | | RIVER | 16.737 MILES | San Pitch River and tributaries from confluence with Sevier River to tailwaters of Gunnison Reservoir (excluding all of Sixmile Creek and Twelvemile Creek above USFS boundary) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030004-002_00 | Twelve Mile Creek | | RIVER | 43.846 MILES | Twelvemile Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT16030004-003_00 | Six Mile Creek | | RIVER | 27.412 MILES | Sixmile Creek and tributaries from confluence with San Pitch River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030004-004_00 | South Creek | | RIVER | 21.208 MILES | South Creek (Manti Creek) and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030004-005_00 | San Pitch-3 | | RIVER | 55.79 MILES | San Pitch River and tributaries from Gunnison Reservoir to U132 crossing below USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 1998 | Completed | • Natural Sources<br>• Agriculture<br>• Hydromodification |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030004-007_00 | Ephraim Creek | | RIVER | 16.227 MILES | Ephraim Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030004-008_00 | Pleasant Creek | | RIVER | 50.385 MILES | Pleasant Creek and tributaries from confluence with San Pitch River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16030004-009_00 | San Pitch-5 | RIVER | 65.657 MILES | San Pitch River and tributaries from U-132 to Pleasant Creek confluence, excluding Cedar Creek, Oak Creek, Pleasant Creek and Cottowood Creek |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | • Source Unknown<br>• Natural Sources |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments<br>Temperature, water | 2008<br>2006 | Low Priority<br>Medium Priority | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030004-010_00 | Oak Creek-1 | | RIVER | 34.908 MILES | Oak Creek and Canal Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030004-011_00 | San Pitch-4 | | RIVER | 10.838 MILES | Silver Creek and tributaries from confluence with San Pitch to headwaters | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2006 | Completed | • Natural Sources<br>• Agriculture |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030004-012_00 | Upper Oak Creek | | RIVER | 6.832 MILES | Oak Creek and tributaries from confluence with San Pitch River to headwaters (near Fairview) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030004-013_00 | Cottonwood Creek-SP | | RIVER | 9.351 MILES | Cottonwood Creek and tributaries from confluence with San Pitch River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT16030005-001_00 | Judd Creek | | RIVER | 0.01 MILES | Judd Creek and tributaries from mouth to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-002_00 | Cherry Creek | | RIVER | 0.01 MILES | Cherry Creek and tributaries from mouth to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-003_00 | Tanner Creek | | RIVER | 0.01 MILES | Tanner Creek and tributaries from mouth to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT16030005-004_00 | Oak Creek-O1 | | RIVER | 0.01 MILES | Oak Creek tributaries from mouth to USFS boundary (near Oak City) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-005_00 | Fool Creek-1 | | RIVER | 0.01 MILES | Fool Creek and tributaries from mouth to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-006_00 | Fish Lake-Sevier | | RIVER | 8.212 MILES | Fishlake National Forest perennial streams located west of Interstate 15 | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT16030005-007_00 | Sevier River-21 | | RIVER | 9.452 MILES | Sevier River north side tributaries from DMAD Reservoir upstream to Sevier Bridge Reservoir (Yuba Dam) excluding Tanner Creek, Chicken Creek, their tributaries, and waters above USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-008_00 | Sevier River-27 | | RIVER | 2.644 MILES | Sevier River south side tributaries from DMAD Reservoir upstream to Yuba Dam, excluding all waters above USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-011_00 | Chicken Creek-3 | | RIVER | 14.675 MILES | Sevier River drainage streams south of Chicken Creek and above USFS boundary flowing towards Sevier River | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-012_00 | Ivie Creek | | RIVER | 14.5 MILES | Ivie Creek and tributaries from Scipio Dam to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-013_00 | Goose Creek-1 | | RIVER | 1.003 MILES | Goose Creek and tributaries from mouth to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-014_00 | Goose Creek-2 | | RIVER | 0.703 MILES | Goose Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-015_00 | Pioneer Creek-1 | | RIVER | 0.399 MILES | Pioneer Creek and tributaries from mouth to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-016_00 | Pioneer Creek-2 | | RIVER | 4.379 MILES | Pioneer Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-017_00 | Sevier River-23 | | RIVER | 1.507 MILES | Sevier River south side tributaries from Gunnison bend reservoir upstream to DMAD Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-018_00 | Chalk Creek-1 | | RIVER | 0 MILES | Chalk Creek and Pine Creek (Millard County) and tributaries from mouth to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-019_00 | Chalk Creek-2 | | RIVER | 33.844 MILES | Chalk Creek and Pine Creek (Millard County) and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-020_00 | Chicken Creek-1 | | RIVER | 17.768 MILES | Chicken Creek and tributaries from Levan to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-021_00 | Corn Creek | | RIVER | 45.942 MILES | Corn Creek and tributaries from mouth to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-022_00 | Chicken Creek-2 | | RIVER | 24.51 MILES | Chicken Creek and tributaries from confluence with Sevier River to Levan | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Supporting | N | Total Dissolved Solids | 1998 | High Priority | • Natural Sources<br>• Hydromodification |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT16030005-023_00 | Meadow Creek | RIVER | 6.975 MILES | Meadow Creek and tributaries from mouth to headwaters (Juab County) |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-024_00 | Round Valley Creek | | RIVER | 0 MILES | Round Valley Creek from mouth upstream to Scipio Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-025_00 | Sevier River-20 | | RIVER | 34.432 MILES | Sevier River from U-132 crossing at the northern most point of the Sevier River (near Dog Valley Wash confluence) upstream to Yuba Dam | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Source Unknown<br>• Agriculture |
| Secondary Recreation | Not Assessed | N | | | | • Hydromodification<br>• Natural Sources |
| Warm Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments<br>Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2010<br>2006<br><br>2006 | Low Priority<br>Completed<br>Pollution<br>Completed | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-026_00 | Sevier River-22 | | RIVER | 42.265 MILES | Sevier River from DMAD Reservoir upstream to U-132 crossing at the northern most point of the Sevier River (near Dog Valley Wash) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Irrigated Crop Production |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | • Agriculture<br>• Hydromodification<br>• Livestock (Grazing or Feeding Operations) |
| Warm Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br><br>2006 | Completed<br>Pollution<br>Completed | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-027_00 | Sevier River-24 | | RIVER | 17.453 MILES | Sevier River from Gunnison Bend Reservoir to DMAD Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Agriculture<br>• Hydromodification |
| Secondary Recreation | Not Assessed | N | | | | • Natural Sources |
| Warm Water Aquatic Life | Not Supporting | N | Phosphorus (Total)<br>Physical substrate habitat alterations<br>Sedimentation/Siltation | 2006<br><br>2006 | Completed<br>Pollution<br>Completed | |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-028_00 | Sevier River-25 | | RIVER | 18.664 MILES | Sevier River from Crafts Lake to Gunnison Bend Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Boron | 2008 | Low Priority | • Natural Sources |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030005-029_00 | Sevier River-26 | | RIVER | 0.324 MILES | Sevier River north side tributaries from Gunnison Bend Reservoir to DMAD Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Sevier River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Non-Game Fish and Other Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

**Table 8-4 Summary of Individual Lake and Reservoir Support for Sevier River Watershed Management Unit**

| Summary of Individual Lake and Reservoir Support for Sevier River Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16030003-005 | Barney Lake | 2 | 2 | | | | | | | | Y | NS | FS | FS | FS | FS |
| UT-L-16030005-026 | DMAD Reservoir | 2 | 2 | | | | | | ND | | Y | FS | FS | FS | FS | |
| UT-L-16030005-021 | Gunnison Bend Reservoir | 2 | 2 | | | | | | | | N | FS | FS | FS | FS | |

**Summary of Individual Lake and Reservoir Support for Sevier River Watershed Management Unit**

| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16030004-002 | Gunnison Reservoir | 2 | 2 | | | | | | | | N | FS | FS | FS | FS | |
| UT-L-16030002-011 | Koosharem Reservoir | 4 | 3B | pH | FS | NS | FS | | TP | | Y | NS | NS | NS | NS | NS |
| UT-L-16030002-005 | Lower Box Reservoir | 4 | 5 | pH | FS | FS | NS | | TP | | Y | NS | NS | NS | NS | NS |
| UT-L-16030003-006 | Manning Meadow Reservoir | 5 | 5 | DO | NS | FS | FS | | No | DO/FK | N | NS | NS | NS | NS | NS |

**Summary of Individual Lake and Reservoir Support for Sevier River Watershed Management Unit**

| | | | | Parameters Not Supporting 2010 | | | | | | | | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16030001-001 | Navajo Lake | 5 | 5, 3B | DO | FS | FS | NS | | No | DO/FK | NA | NS | NS | NS | NS | NS |
| UT-L-16030004-001 | Nine Mile Reservoir | 5 | 5 | pH,DO | FS | FS | FS | | No | | N | NS | NS | NS | NS | FS |
| UT-L-16030002-004 | Otter Creek Reservoir | 4 | 4 | DO,T | | | | | | | Y | NS | NS | NS | NS | |
| UT-L-16030004-005 | Palisades Lake | 5 | 5 | T | | | | | | | N | NS | NS | NS | FS | |

**Summary of Individual Lake and Reservoir Support for Sevier River Watershed Management Unit**

| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16030001-006 | Panguitch Lake | 4 | 4 | DO, pH | FS | FS | FS | | TP | | Y | NS | NS | NS | NS | FS |
| UT-L-16030002-007 | Pine Lake | 2 | 2 | | FS | FS | FS | | No | | N | NS | NS | NS | FS | FS |
| UT-L-16030001-011 | Piute Reservoir | 5 | 5 | T | FS | FS | NS | | TP | | Y | NS | NS | NS | FS | NS |
| UT-L-16030003-012 | Redmond Lake | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |

**Summary of Individual Lake and Reservoir Support for Sevier River Watershed Management Unit**

| | | | | Parameters Not Supporting 2010 | | | | | | | | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16030003-016 | Rex's Reservoir | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |
| UT-L-16030003-007 | Sevier Bridge Reservoir | 2 | 2 | FS | | | | | | | Y | FS | FS | FS | FS | |
| UT-L-16030002-002 | Tropic Reservoir | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |

## Summary of Individual Lake and Reservoir Support for Sevier River Watershed Management Unit

| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |

**Notes:**

FS Fully Supporting

NS Not Supporting

Y Yes

N No

DO Dissolved Oxygen

FK Fish Kill

T Temperature

Total P Total Phosphorus

NA Not Analyzed

**Table 8-5 Individual Lake and Reservoir 2010 Trophic State Index (TSI) – Sevier River Watershed**

| Individual Lake and Reservoir 2010 Trophic State Index (TSI)<br>Sevier River Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Sevier River | UT-L-16030002-011 | Koosharem Reservoir | 8/1/2007 | 76 | 25 | 55 |
| Sevier River | UT-L-16030002-005 | Lower Box Creek Reservoir | 8/9/2007 | 67 | 47 | 57 |
| Sevier River | UT-L-16030003-006 | Manning Meadow Reservoir | 8/8/2007 | 49 | 52 | 52 |
| Sevier River | UT-L-16030001-001 | Navajo Lake | 8/22/2007 | 43 | | 37 |
| Sevier River | UT-L-16030004-001 | Nine Mile Reservoir | 9/13/2007 | 37 | 46 | 51 |
| Sevier River | UT-L-16030001-006 | Panguitch Lake | 9/4/2007 | 41 | 46 | 58 |
| Sevier River | UT-L-16030001-006 | Panguitch Lake | 9/4/2007 | 58 | 46 | 41 |
| Sevier River | UT-L-16030002-007 | Pine Lake | 7/11/2007 | 33 | 36 | 37 |
| Sevier River | UT-L-16030001-011 | Piute Reservoir | 7/5/2007 | 50 | 8 | 37 |
| Sevier River | UT-L-16030001-011 | Piute Reservoir | 7/30/2007 | 53 | 61 | 62 |

| Individual Lake and Reservoir 2010 Trophic State Index (TSI)<br><br>Sevier River Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |

Notes:

TSI-SD = Trophic State Index from secchi disk

TSI-Chla = Trophic State Index from chlorophyll-a

TSI-TP = Trophic State Index from total phosphorus

**Table 8-6 Summary of Individual Lake and Reservoir Trophic State Index (TSI) – Sevier River Watershed**

| Summary of Individual Lake and Reservoir Trophic State Index (TSI)<br>Sevier River Watershed | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Sevier River | UT-L-16030002-011 | Koosharem Reservoir | 74 | 55 | 66 | 57 | 65 | 57 | 52 | 57 | 52 | 25 | M | O |
| Sevier River | UT-L-16030002-005 | Lower Box Reservoir | | 77 | 75 | 73 | 65 | 66 | 64 | 61 | 51 | 47 | E | M |
| Sevier River | UT-L-16030003-006 | Manning Meadow Reservoir | | 54 | 50 | 50 | 53 | NA | 52 | 54 | 51 | 46 | E | M |
| Sevier River | UT-L-16030001-001 | Navajo Lake | 34 | 35 | 40 | 41 | 40 | 43 | 36 | 36 | 40 | 37 | M | O |
| Sevier River | UT-L-16030004-001 | Nine Mile Reservoir | 45 | 59 | 53 | 45 | 52 | 37 | 53 | 46 | 45 | 46 | M | M |

| Summary of Individual Lake and Reservoir Trophic State Index (TSI)<br>Sevier River Watershed | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Sevier River | UT-L-16030001-006 | Panguitch Lake | 54 | 51 | 53 | 50 | 51 | 62 | 46 | 59 | 48 | 46 | M | M |
| Sevier River | UT-L-16030002-007 | Pine Lake | 44 | 34 | 20 | 31 | 42 | 53 | 39 | 30 | 35 | 36 | O | O |
| Sevier River | UT-L-16030001-011 | Piute Reservoir | 57 | 54 | 46 | 48 | 55 | 56 | 51 | 51 | 45 | 34 | M | O |

**Summary of Individual Lake and Reservoir Trophic State Index (TSI)**

**Sevier River Watershed**

| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |

Notes:

2010 Old Method TSI calculated using the 2008 Integrated Report Methodology

2010 Current Method TSI calculated using the 2010 Integrated Report Methodology of only chlorophyll-a

O = Oligotrophic

M = Mesotrophic

E = Eutrophic

H = Hypereutrophic

# FIGURES

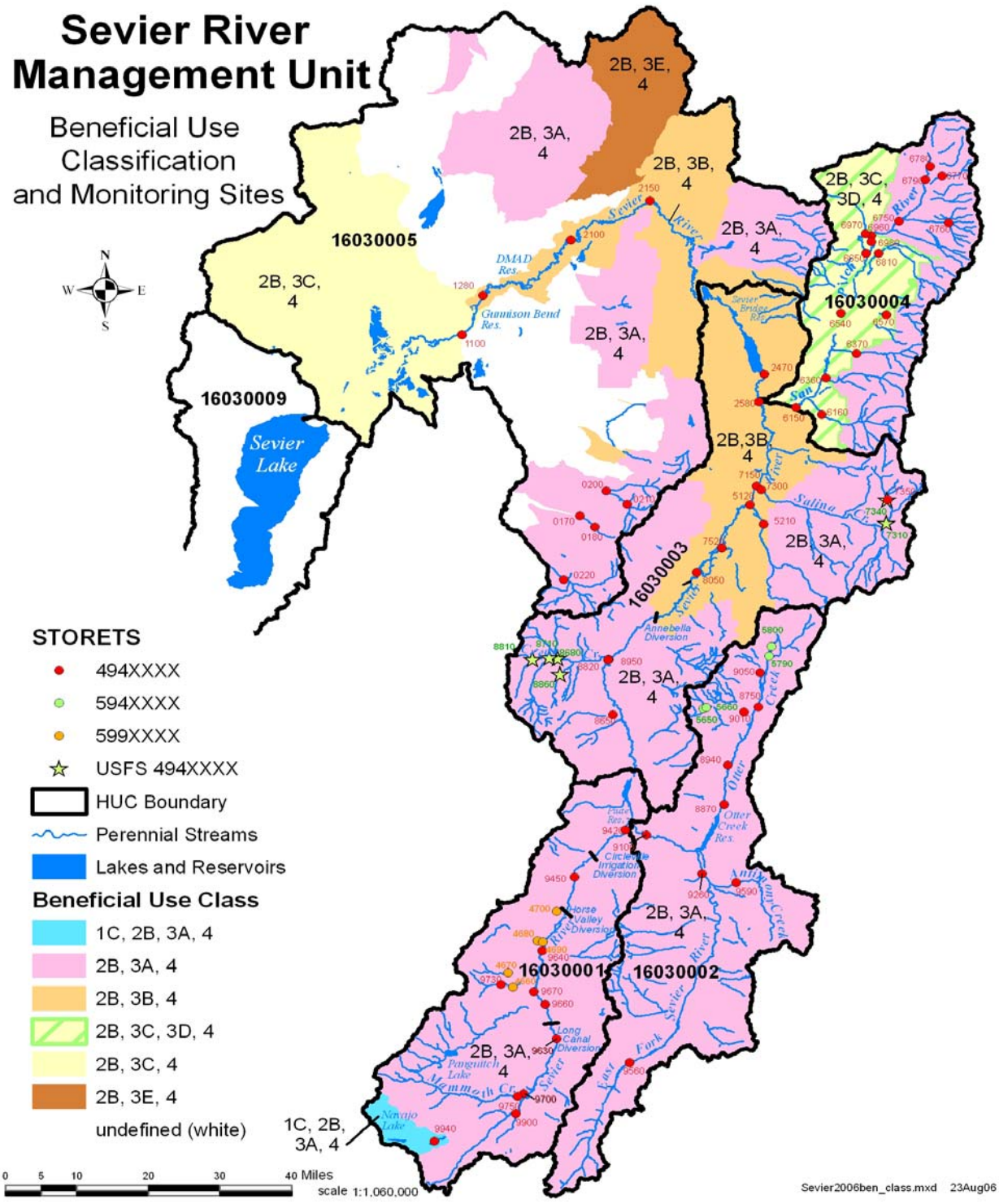


**Figure 8-1 Beneficial Use Classifications for Sevier River Watershed Management Unit**

# CHAPTER 9: CEDAR/BEAVER WATERSHED MANAGEMENT UNIT ASSESSMENT

## 9.1 INTRODUCTION

The Cedar/Beaver Watershed Management Unit includes all streams located in the USGS Hydrological Units (HUCs) listed in Table 9-1. Few perennial streams are found in this management unit and even the most significant streams are somewhat small including: Beaver River, Coal Creek, Shoal Creek and Pinto Creek.

Biological, water chemistry and field data collected from January 1, 2004 through December 31, 2008 were used to make assessments. Water quality data were compared against standards established for each of the designated beneficial uses. Figure 9-1 shows the beneficial use classifications for this watershed management unit.

## 9.2 IMPAIRED WATERS

The list of streams and lakes impaired and requiring a TMDL (Category 5; Section 303d) for the Bear River are presented in Table 9-2. Pinto Creek and Newcastle Reservoir are new listings for 2010. Newcastle Reservoir has an approved TMDL for this cycle and is requested for delisting for those parameters (Table 9-3). Assessment results for all AUs for streams are presented in Table 9-4 and lakes in Table 9-5. Lake assessments are further discussed in the next section.

## 9.3 LAKE ASSESSMENTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends.

Table 9-6 shows TSIs based on each sample collected from May through September by sample date. Table 9-7 contains a summary of lake trophic status by study periods. Note that some of the changes in TSIs between assessment periods is due to the variability in the lakes and reservoirs and some is due to switching methodologies between 2008 and 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). Table 9-7 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. No differences were observed between the methods suggesting little difference in trophic states estimated with the new and older methods.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. Consistent trends that resulted in a net TSI change of five or changes greater than 10 between 2008 and 2010, which are not attributable to the change in TSI methodology alone, are identified. Puffer Lake exhibits an increasing trend in TSI and Newcastle Reservoir a decreasing trend.

## 9.4 HEALTH ADVISORIES

Upper Enterprise and Newcastle Reservoirs have fish consumption advisories for mercury.

# TABLES

**Table 9-1 USGS Hydrological Units in the Cedar/Beaver Watershed Management Unit**

| Hydrological Units in the Cedar/Beaver Watershed Management Unit | |
|---|---|
| **Hydrological Unit Code** | **Hydrological Unit Name** |
| 16030006 | Escalante Desert |
| 16030007 | Beaver Bottoms-Upper Beaver |
| 16030008 | Lower Beaver |

**Table 9-2 Impaired Streams and Lakes Requiring a TMDL – Cedar/Beaver Watershed**

| Impaired Streams and Lakes Requiring a TMDL - Cedar/Beaver Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-160300006-002 | Pinto Creek | STREAM | 28.1 MILES | Pinto Creek, Middle Pinto Creek, and tributaries |

| Impaired Streams and Lakes Requiring a TMDL - Cedar/Beaver Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030006-008_00 | NEWCASTLE RESERVOIR | FRESHWATER LAKE | 163 ACRES | LL= 373858/1133115 36S 15W 22,27 USGS MAP AND DATE: NEWCASTLE,UTAH-1972 WATERSHED: PINTO CREEK, WMU Sevier River |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | |
| Mercury in Fish Tissue | 2010 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT16030006-004_00 | Parowan Creek | Stream | 35.7 | Parowan Creek and tributaries from the south end of Main Street in Parowan to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |

| Impaired Streams and Lakes Requiring a TMDL - Cedar/Beaver Watershed | | | | |
|---|---|---|---|---|
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030006-017_00 | Yankee Meadow Reservoir | FRESHWATER LAKE | 53 ACRES | TOWNSHIP: 35S RANGE: 8W SECTION: 20 USGS MAP AND DATE: PAROWAN, UTAH-1971 WATERSHED: BOWERY CREEK, |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2008 | Low Priority | Cold Water Aquatic Life | |
| pH | 2006 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030006-019_00 | Red Creek Reservoir (Iron County) | FRESHWATER RESERVOIR | 62 ACRES | TOWNSHIP: 34S RANGE: 7W SECTION: 7,18 USGS MAP AND DATE: RED CREEK RESERVOIR, UTAH-1971 WATERSHED: RED CREEK |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | High Priority | Cold Water Aquatic Life | |

| Impaired Streams and Lakes Requiring a TMDL - Cedar/Beaver Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030007-022_00 | KENTS LAKE (MIDDLE) | FRESHWATER LAKE | 86 ACRES | LL= 381400/1122709 30S,29S 5W 6,31 USGS MAP AND DATE: CIRCLEVILLE MOUNTAIN, UTAH-1971 WATERSHED: BIRCH CREEK |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water<br><br>Phosphorus (Total) | 2006<br><br>2006 | Low Priority<br><br>Low Priority | Cold Water Aquatic Life<br><br>Cold Water Aquatic Life | • Source Unknown<br>• Managed Pasture Grazing<br>• Other Recreational Pollution Sources<br>• Rangeland Grazing<br>• Site Clearance (Land Development or Redevelopment) |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-16030007-025_00 | Three Creeks Reservoir | FRESHWATER LAKE | 57 ACRES | LL= 381745/1122515 29S 5W 9 USGS MAP AND DATE: DELANO PEAK, UTAH-1943 WATERSHED: LAKE STREAM |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| pH | 2006 | Low Priority | Cold Water Aquatic Life | • Source Unknown |

**Table 9-3 Delisting from the 303d List – Cedar/Beaver Watershed**

| Delisting from the 303d List, Cedar/Beaver Watershed | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Unit** | **AU Name** | **Location Description** | **Water Type** | **Size** | **Cause** | **Reason for Removal** | **Delisting Comment** |
| UT-L-16030006-008_00 | NEWCASTLE RESERVOIR | LL= 373858/1133115 36S 15W 22,27 USGS MAP AND DATE: NEWCASTLE,UTAH-1972 WATERSHED: PINTO CREEK, | FRESHWATER LAKE | 163 ACRES | Oxygen, Dissolved | TMDL approved or established by EPA (4A) | N/A |
| UT-L-16030006-008_00 | NEWCASTLE RESERVOIR | LL= 373858/1133115 36S 15W 22,27 USGS MAP AND DATE: NEWCASTLE,UTAH-1972 WATERSHED: PINTO CREEK, | FRESHWATER LAKE | 163 ACRES | Phosphorus (Total) | TMDL approved or established by EPA (4A) | N/A |

**Table 9-4 Assessment Results for Cedar Beaver Watershed Stream Assessment Units**

| Assessment Results for Cedar Beaver Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030006-001_00 | Coal Creek | | RIVER | 39.637 MILES | Coal Creek and tributaries from Main Street in Cedar City (SR130) to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030006-004_00 | Parowan Creek | | STREAM | 35.7 | Parowan Creek and tributaries from the south end of Main Street in Parowan to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | • Source Unknown |

| Assessment Results for Cedar Beaver Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030007-001_00 | Beaver River-1 | | RIVER | 7.019 MILES | Beaver River Below Minersville Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030007-002_00 | Beaver River-2 | | RIVER | 57.567 MILES | Beaver River and tributaries from Minersville Reservoir to USFS boundary | |

| Assessment Results for Cedar Beaver Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | pH | 2006 | Completed / Pollution | • Source Unknown<br>• Agriculture |
| Cold Water Aquatic Life | Not Supporting | N | pH<br>Phosphorus (Total)<br>Physical substrate habitat alterations<br>Temperature, water | 2006<br>2006<br><br>2006 | Completed<br>Completed<br>Pollution<br>Completed | • Habitat Modification - other than Hydromodification<br>• Hydromodification |
| Secondary Recreation | Not Supporting | N | pH | 2006 | Completed | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT16030007-003_00 | Beaver River-3 | | RIVER | 142.767 MILES | Beaver River and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

**Table 9-5 Summary of Individual Lake and Reservoir Support for Cedar/Beaver River Watershed Management Unit**

| Summary of Individual Lake and Reservoir Support for Cedar/Beaver River Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16030007-024 | Anderson Meadow Reservoir | 2 | 2 | | | | | | | | Y | FS | FS | FS | FS | |
| UT-L-16030007-020 | Kents Lake | 4 | 4 | | FS | FS | FS | | TP, TSI | | N | NS | NS | NS | FS | FS |
| UT-L-16030007-027 | Labaron Reservoir | 4 | 4 | | | | | | | DO | Y | NS | NS | NS | FS | |
| UT-L-16030007-011 | Minersville Reservoir | 4 | 4 | | | | | | | | N | NS | NS | NS | FS | |
| UT-L-16030006-008 | Newcastle Reservoir | 5 | 5, 4A, 3B | DO | NS | NS | FS | Hg | TP | | N | NS | NS | NS | NS | NS |

| Summary of Individual Lake and Reservoir Support for Cedar/Beaver River Watershed Management Unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16030007-028 | Puffer Lake | 4 | 3B | FS | FS | FS | NS | | TP, TSI | | Y | NS | NS | NS | FS | NS |
| UT-L-16030006-019 | Red Creek Reservoir (Iron) | 5 | 5 | DO | NS | FS | FS | | | DO | N | NS | NS | NS | NS | NS |
| UT-L-16030007-025 | Three Creeks Reservoir | 2 | 2 | FS | | | | | | | Y | FS | FS | NS | FS | |
| UT-L-16030006-002 | Upper Enterprise Reservoir | 2 | 2 | FS | | | | | | | Y | NS | NS | NS | FS | |
| UT-L-16030006-017 | Yankee Meadow Reservoir | 5 | 5 | NS-pH,DO | FS | FS | FS | | | FK | N | NS | NS | NS | NS | FS |

| Summary of Individual Lake and Reservoir Support for Cedar/Beaver River Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |

**Notes:**

FS Fully Supporting

NS Not Supporting

Y Yes

N No

DO Dissolved Oxygen

FK Fish Kill

T Temperature

Total P Total Phosphorus

NA Not Analyzed

TDS Total Dissolved Solids

Hg Mercury

**Table 9-6 Individual Lake and Reservoir 2010 Trophic State Index (TSI) – Cedar/Beaver Watershed Management Unit**

| Individual Lake and Reservoir 2010 Trophic State Index (TSI)<br>Cedar/Beaver Watershed Management Unit | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Cedar / Beaver River | UT-L-16030007-020 | Kents Lake | 9/12/2007 | 78 | 67 | 62 |
| Cedar / Beaver River | UT-L-16030006-008 | Newcastle Reservoir | 9/5/2007 | 55 | 31 | 53 |
| Cedar / Beaver River | UT-L-16030007-028 | Puffer Lake | 8/9/2007 | 60 | 77 | 65 |

Notes:

TSI-SD = Trophic State Index from secchi disk

TSI-Chla = Trophic State Index from chlorophyll-a

TSI-TP = Trophic State Index from total phosphorus

**Table 9-7 Summary of Individual Lake and Reservoir Trophic State Index (TSI) – Cedar/Beaver Watershed Management Unit**

| Summary of Individual Lake and Reservoir Trophic State Index (TSI)<br>Cedar/Beaver Watershed Management Unit | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Cedar / Beaver River | UT-L-16030007-020 | Kents Lake | | 69 | 67 | 64 | 58 | 78 | 63 | 59 | 69 | 67 | E | E |
| Cedar / Beaver River | UT-L-16030006-008 | Newcastle Reservoir | 48 | 54 | 42 | 48 | 54 | 47 | 59 | 62 | 46 | 31 | M | O |
| Cedar / Beaver River | UT-L-16030007-028 | Puffer Lake | 49 | 36 | 38 | 39 | 50 | 50 | 40 | 46 | 67 | 77 | E | H |

Notes:

2010 Old Method TSI calculated using the 2008 Integrated Report Methodology

2010 Current Method TSI calculated using the 2010 Integrated Report Methodology of only chlorophyll-a

O = Oligotrophic

M = Mesotrophic

E = Eutrophic

H = Hypereutrophic

# Figures

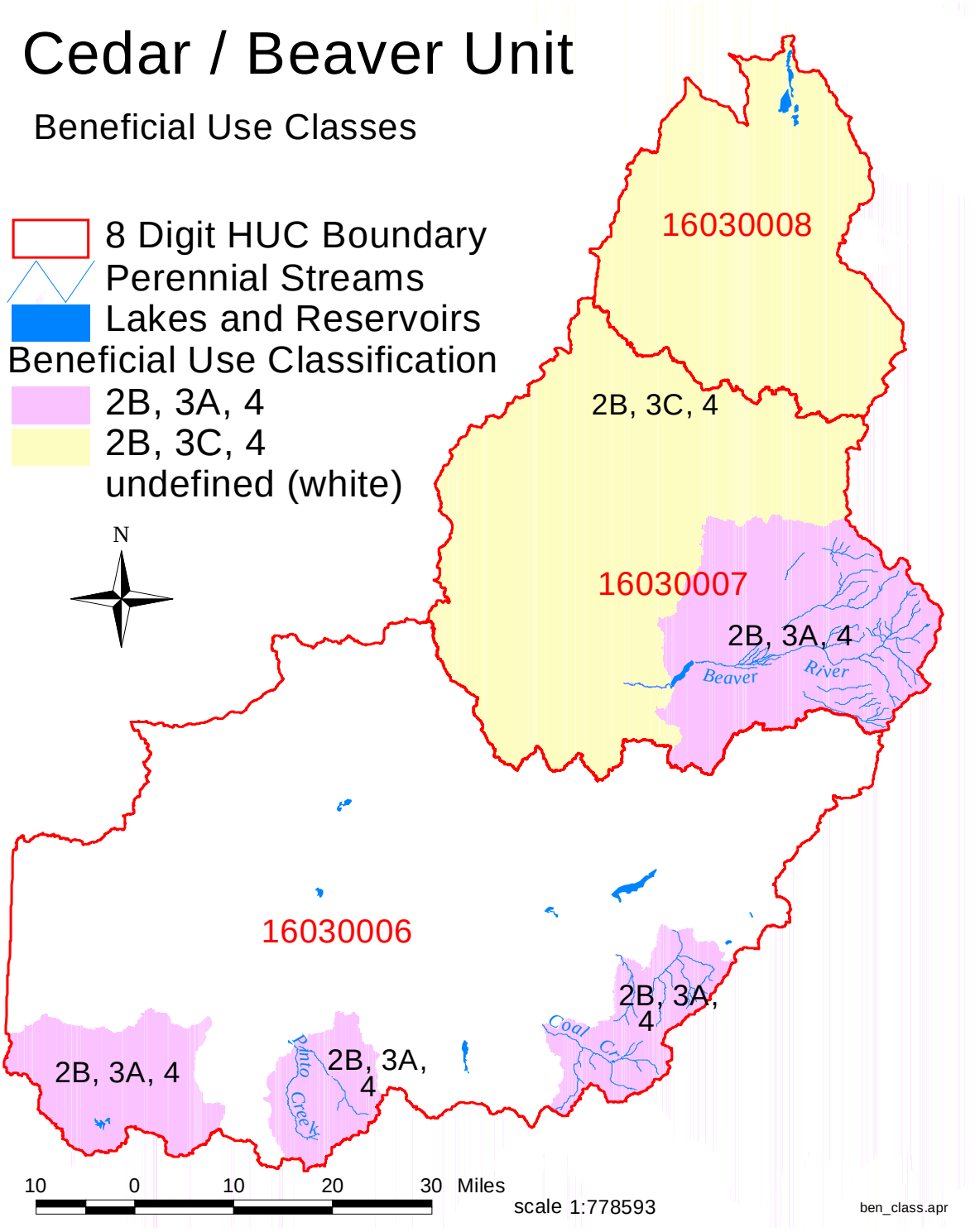


**Figure 9-1 Beneficial Use Classes for Cedar/Beaver Watershed Management Unit**

# CHAPTER 10: LOWER COLORADO RIVER WATERSHED MANAGEMENT UNIT ASSESSMENT

## 10.1. INTRODUCTION

The Lower Colorado River Watershed Management Unit (WMU) includes all streams located in the USGS Hydrologic Units listed in Table 10.1. Some of the major streams in this WMU are the Santa Clara River, Virgin River, East Fork of the Virgin River, North Fork of the Virgin River, North Creek, Kanab Creek and Laverkin Creek.

Biological, water chemistry and field data collected from January 1, 2004 through December 31, 2008 were used to make assessments. Water quality data were compared against standards established for each of the designated beneficial uses. Figure 10-1 shows the beneficial use classifications for this watershed management unit.

## 10.2 IMPAIRED WATERS

The list of streams and lakes impaired and requiring a TMDL (Category 5; Section 303d) for the Lower Colorado are presented in Table 10-2. New listings for 2010 include North Fork Virgin River-1, North Fork Virgin River-2, and Virgin River-1. None of the streams or lakes previously listed on the Section 303d list of impaired waters are now meeting the standards or have an approved TMDL for this cycle. Assessment results for all AUs for streams are presented in Table 10-3 and for lakes in Table 10-4. Lake assessments are further discussed in the next section.

## 10.3 LAKE ASSESSMENTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends.

Table 10-5 shows TSIs based on each sample collected from May through September by sample date. Table 4-6 contains a summary of lake trophic status by study periods. Note that some of the changes in TSIs between assessment periods is due to the variability in the lakes and reservoirs and some is due to switching methodologies between 2008 and 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). Table 10-6 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. A small difference was observed for Gunlock Reservoir and a medium difference for Kolob Reservoir. The lacks of large differences suggest little difference in trophic state between the new and older methods.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. Consistent trends that resulted in a net TSI change of five or changes greater than 10 between 2008 and 2010, which are not attributable to the change in TSI methodology alone, are identified. Gunlock Reservoir appears to have an increasing trend in TSI.

## HEALTH ADVISORIES

Gunlock and Sand Hollow Reservoirs have fish consumption advisories for mercury.

# TABLES

**Table 10-1 USGS Hydrological Units in the Lower Colorado Watershed Management Unit**

| USGS Hydrological Units in the Lower Colorado Watershed Management Unit. | |
|---|---|
| **Hydrological Unit Code** | **Hydrological Unit Name** |
| 15010003 | Kanab |
| 15010008 | Upper Virgin |
| 15010009 | Fort Pierce Wash |
| 15010010 | Lower Virgin |

**Table 10-2 Impaired Streams and Lakes Requiring a TMDL – Lower Colorado Watershed**

| Impaired Streams and Lakes Requiring a TMDL - Lower Colorado Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT15010003-002_00 | Kanab Creek-1 | RIVER | 17.637 MILES | Kanab Creek and tributaries from state line to the confluence with Fourmile Hollow near the White Cliffs |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Total Dissolved Solids | 2008 | Low Priority | Agricultural | • Agriculture<br>• Natural Sources |

| Impaired Streams and Lakes Requiring a TMDL - Lower Colorado Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT15010003-004_00 | Johnson Wash-1 | RIVER | 11.964 MILES | Johnson Wash and tributaries from Utah-Arizona state line to Skutumpah Canyon confluence |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Total Dissolved Solids | 2008 | Low Priority | Agricultural | • Agriculture |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT15010008-001_00 | Santa Clara-1 | RIVER | 23.667 MILES | Santa Clara River from confluence with Virgin River to Gunlock Reservoir |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Boron | 2008 | Low Priority | Agricultural | • Source Unknown |
| Temperature, water | 2008 | Low Priority | Warm Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT15010008-002_00 | Santa Clara-2 | RIVER | 24.958 MILES | Santa Clara River and tributaries from Gunlock Reservoir to Baker Dam Reservoir (includes Magotsu Creek) |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |

| Impaired Streams and Lakes Requiring a TMDL - Lower Colorado Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT15010008-004_00 | Virgin River-2 | RIVER | 41.11 MILES | Virgin River and tributaries from Santa Clara River confluence to Quail Creek diversion, excluding Quail, Ash, and La Verkin Creeks |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Boron | 2008 | Low Priority | Agricultural | • Source Unknown<br>• Drought-related Impacts |
| Temperature, water | 2008 | Low Priority | Warm Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT15010008-013_00 | North Fork Virgin River-2 | RIVER | 34.805 MILES | North Fork Virgin River and tributaries from Deep Creek confluence to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Escherichia coli | 2010 | Low Priority | Secondary Recreation | • Natural Sources<br>• Other Recreational Pollution Sources<br>• Rangeland Grazing |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT15010008-015_00 | North Fork Virgin River-1 | RIVER | 38.317 MILES | North Fork Virgin River and tributaries from confluence with East Fork Virgin River to Kolob Creek confluence |

| Impaired Streams and Lakes Requiring a TMDL - Lower Colorado Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | • Natural Sources<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT15010010-001_00 | Virgin River-1 | RIVER | 15.242 MILES | Virgin River from state line to Santa Clara River confluence |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Boron | 2010 | Low Priority | Agricultural | • Agriculture<br>• Source Unknown |
| Temperature, water | 2006 | Low Priority | Warm Water Aquatic Life | |

**Table 10-3 Assessment Results for Lower Colorado River Watershed Stream Assessment Units**

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010003-001_00 | Cottonwood Canyon | | RIVER | 8.616 MILES | Cottonwood Canyon from Utah-Arizona state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Wildlife Habitat | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010003-002_00 | Kanab Creek-1 | | RIVER | 17.637 MILES | Kanab Creek and tributaries from state line to the confluence with Fourmile Hollow near the White Cliffs | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2008 | | • Natural Sources<br>• Agriculture |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010003-003_00 | Kanab Creek-2 | | RIVER | 5.812 MILES | Kanab Creek and tributaries from the confluence with Fourmile Hollow near the White Cliffs to Reservoir Canyon | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010003-004_00 | Johnson Wash-1 | | RIVER | 11.964 MILES | Johnson Wash and tributaries from Utah-Arizona state line to Skutumpah Canyon confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2008 | | • Agriculture |
| Non-Game Fish and Other Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT15010003-005_00 | Johnson Wash-2 | | RIVER | 25.619 MILES | Johnson Wash and tributaries, from (including) Skutumpah Canyon to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010003-006_00 | Kanab Creek-3 | | RIVER | 0.029 MILES | Kanab Creek and tributaries from Reservoir Canyon to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | | Water Type | Size | Location Description | |
|---|---|---|---|---|---|---|
| UT15010008-001_00 | Santa Clara-1 | | RIVER | 23.667 MILES | Santa Clara River from confluence with Virgin River to Gunlock Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Boron<br>Total Dissolved Solids | 2008<br>1994 | Completed | • Source Unknown<br>• Hydromodification |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | • Natural Sources<br>• Agriculture |
| Secondary Recreation | Not Assessed | N | | | | • Urban Runoff/Storm Sewers |
| Warm Water Aquatic Life | Not Supporting | N | Selenium<br>Temperature, water | 2006<br>2008 | Completed | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT15010008-002_00 | Santa Clara-2 | RIVER | 24.958 MILES | Santa Clara River and tributaries from Gunlock Reservoir to Baker Dam Reservoir (includes Magotsu Creek) |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | • Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2008 | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-003_00 | Santa Clara-3 | | RIVER | 14.815 MILES | Santa Clara River and tributaries from Baker Dam Reservoir to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-004_00 | Virgin River-2 | | RIVER | 41.11 MILES | Virgin River and tributaries from Santa Clara River confluence to Quail Creek diversion, excluding Quail, Ash, and La Verkin Creeks | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Boron | 2008 | | • Source Unknown<br>• Drought-related Impacts |
| Secondary Recreation | Insufficient Information | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Temperature, water | 2008 | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-005_00 | Quail Creek | | RIVER | 9.926 MILES | Quail Creek and tributaries from Quail Creek Reservoir to headwaters | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Domestic Water Supply | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-006_00 | Leeds Creek | | RIVER | 13.862 MILES | Leeds Creek and tributaries from confluence with Quail Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-007_00 | Ash Creek-1 | | RIVER | 0.01 MILES | Ash Creek and tributaries from confluence with La Verkin Creek to springs near Toquerville | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-008_00 | Ash Creek-2 | | RIVER | 0.01 MILES | Ash Creek and tributaries from springs near Toquerville to Ash Creek Reservoir | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-009_00 | Ash Creek-3 | | RIVER | 35.745 MILES | Ash Creek and tributaries from Ash Creek Reservoir to headwaters | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-010_00 | Laverkin Creek | | RIVER | 45.729 MILES | La Verkin Creek and tributaries from confluence with Virgin River to headwaters (excludes Ash Creek) | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Warm Water Aquatic Life | Fully Supporting | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-011_00 | Virgin River-3 | | RIVER | 4.072 MILES | Virgin River and tributaries from Quail Creek Diversion to North Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Warm Water Aquatic Life | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-012_00 | Virgin River-4 | | RIVER | 22.553 MILES | Virgin River and tributaries from North Creek confluence to Norh Fork Virgin River | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| UT15010008-013_00 | North Fork Virgin River-2 | | RIVER | 34.805 MILES | North Fork Virgin River and tributaries from Deep Creek confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | • Other Recreational Pollution Sources<br>• Rangeland Grazing<br>• Natural Sources |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Supporting | N | Escherichia coli | 2010 | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-014_00 | North Creek | | RIVER | 32.712 MILES | North Creek and tributaries from confluence with Virgin River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Supporting | N | Total Dissolved Solids | 1998 | Completed | • Natural Sources<br>• Agriculture |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-015_00 | North Fork Virgin River-1 | | RIVER | 38.317 MILES | North Fork Virgin River and tributaries from confluence with East Fork Virgin River to Kolob Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Natural Sources<br>• Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2010 | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-016_00 | Kolob Creek | | RIVER | 15.694 MILES | Kolob Creek and tributaries from confluence with North Fork Virgin River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-017_00 | Deep Creek | | RIVER | 60.388 MILES | Deep Creek and tributaries from confluence with North Fork Virgin River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Assessed | N | | | | |
| Cold Water Aquatic Life | Not Assessed | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-018_00 | East Fork Virgin-1 | | RIVER | 37.093 MILES | East Fork of Virgin River and tributaries from confluence with North Fork Virgin River to Carmel Junction | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-019_00 | East Fork Virgin-2 | | RIVER | 18.735 MILES | East Fork Virgin River and tributaries from Carmel Junction to Glendale | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010008-020_00 | East Fork Virgin-3 | | RIVER | 28.757 MILES | East Fork Virgin River and tributaries from Glendale to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010010-001_00 | Virgin River-1 | | RIVER | 15.242 MILES | Virgin River from state line to Santa Clara River confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Not Supporting | N | Boron | 2010 | | • Agriculture<br>• Source Unknown |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Not Supporting | N | Temperature, water | 2006 | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT15010010-002_00 | Beaver Dam Wash | | RIVER | 24.426 MILES | Beaver Dam Wash and tributaries from Motoqua to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |

| Assessment Results for Lower Colorado River Watershed Stream Assessment Units | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| Warm Water Aquatic Life | Fully Supporting | N | | | | |

**Table 10-4 Assessment Results for Lower Colorado River Watershed Lake Assessment Units**

## Assessment Results for Lower Colorado River Watershed Lake Assessment Units

| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| **UT-L-15010008-008** | **Baker Dam Reservoir** | **4** | **4** | **DO** | | | | | | | **Y** | **NS** | **NS** | **NS** | **NS** | |
| **UT-L-15010008-001** | **Gunlock Reservoir** | **4A** | **4A** | **DO** | **NS** | **FS** | **FS** | | **TP, TSI** | | **Y** | **NS** | **NS** | **NS** | **NS** | **NS** |
| **UT-L-15010008-018** | **Kolob Reservoir** | **2** | **2** | | **FS** | **FS** | **FS** | | **No** | | **ND** | **NS** | **NS** | **FS** | **FS** | **FS** |

## Assessment Results for Lower Colorado River Watershed Lake Assessment Units

| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| **UT-L-15010008-024** | **Quail Creek Reservoir** | **2** | **2** | **FS** | | | | | | | **N** | **FS** | **FS** | **FS** | **FS** | |

## Assessment Results for Lower Colorado River Watershed Lake Assessment Units

| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |

Notes:

**FS Fully Supporting**

**NS Not Supporting**

**Y Yes**

**N No**

**DO Dissolved Oxygen**

**FK Fish Kill**

**T Temperature**

**Total P Total Phosphorus**

**NA Not Analyzed**

**Table 10-5 Individual Lake and Reservoir 2010 Trophic State Index (TSI)**

| Individual Lake and Reservoir 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Lower Colorado River | UT-L-15010008-001 | Gunlock Reservoir | 9/5/2007 | 57 | 55 | 72 |
| Lower Colorado River | UT-L-15010008-018 | Kolob Reservoir | 8/23/2007 | 45 | 15 | 37 |

Notes:

TSI-SD = Trophic State Index from secchi disk

TSI-Chla = Trophic State Index from chlorophyll-a

TSI-TP = Trophic State Index from total phosphorus

**Table 10-6 Summary of Individual Lake and Reservoir Trophic State Index (TSI)**

| Summary of Individual Lake and Reservoir Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Lower Colorado River | UT-L-15010008-001 | Gunlock Reservoir | 42 | 42 | 47 | 43 | 40 | 39 | 43 | 54 | 61 | 55 | E | E |
| Lower Colorado River | UT-L-15010008-018 | Kolob Reservoir | 42 | 48 | 45 | 44 | 35 | 35 | 32 | 41 | 32 | 15 | O | O |

| Summary of Individual Lake and Reservoir Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |

Notes:

2010 Old Method TSI calculated using the 2008 Integrated Report Methodology

2010 Current Method TSI calculated using the 2010 Integrated Report Methodology of only chlorophyll-a

O = Oligotrophic

M = Mesotrophic

E = Eutrophic

H = Hypereutrophic

# FIGURES

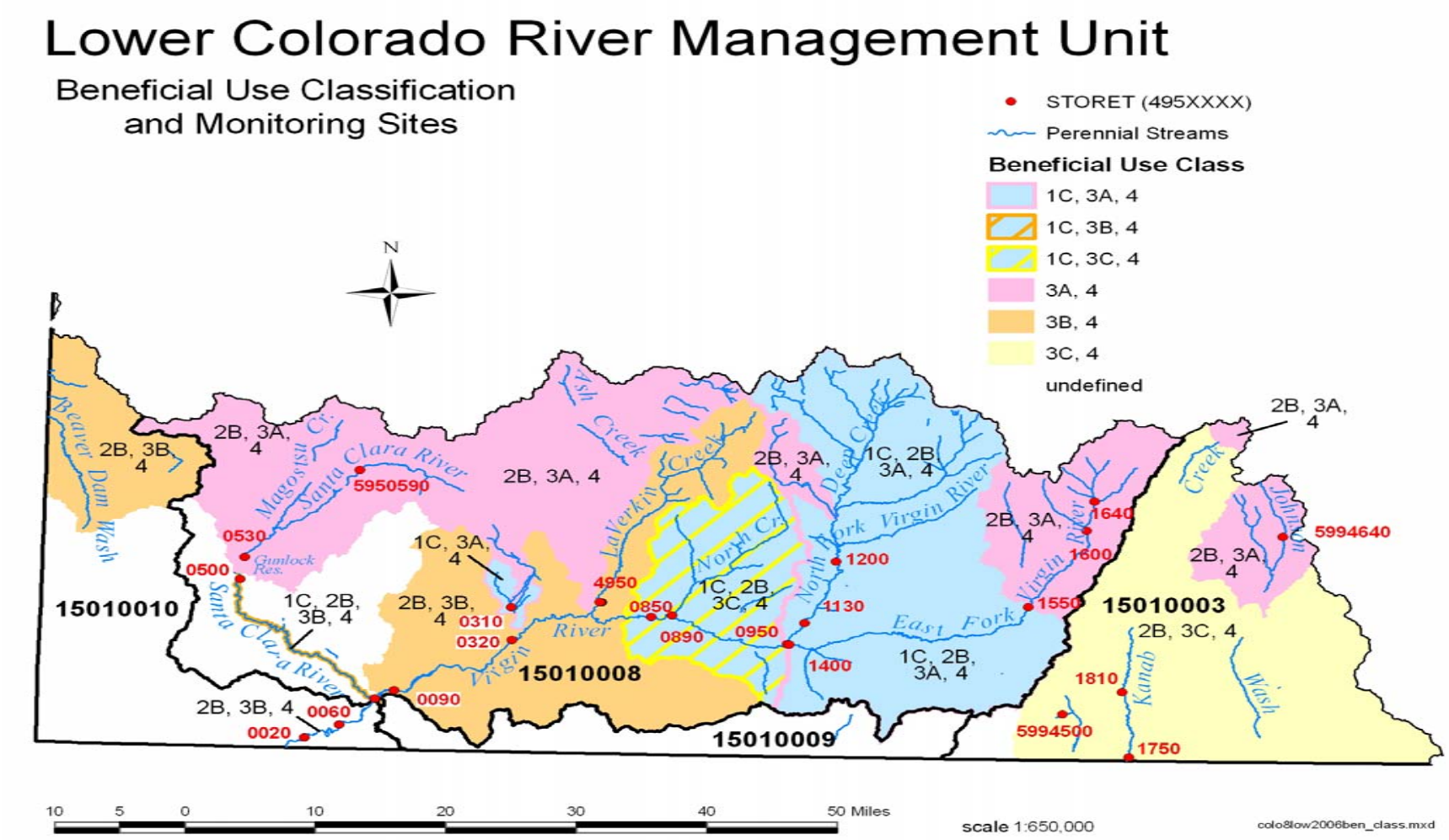


**Figure 10-1 Beneficial Use Classes for Lower Colorado River Watershed Management Unit**

# CHAPTER 11: COLORADO RIVER WEST WATERSHED MANAGEMENT UNIT WATER QUALITY ASSESSMENT

## 11.1 INTRODUCTION

The West Colorado Watershed Management Unit includes all streams located in the USGS Hydrological Units (HUCs) listed in Table 11-1. Some of the largest streams in the WMU follow: Price River, Huntington Creek, Cottonwood Creek, Ferron Creek, San Rafael River, Escalante River, Muddy Creek, Dirty Devil River, Fremont River, and portions of the Green River.

Biological, water chemistry and field data collected from January 1, 2004 through December 31, 2008 were used to make assessments. Water quality data were compared against standards established for each of the designated beneficial uses. Figure 11-1 shows the beneficial use classifications for this watershed management unit.

## 11.2 IMPAIRED WATERS

The list of streams and lakes impaired and requiring a TMDL (Category 5; Section 303d) for the Bear River are presented in Table 11-2. New listings for 2010 include Price River-3, Upper Quitchupah Creek, Lower Quitchupah Creek, Lower Bowns Reservoir, and Wide Hollow Reservoir. Paria-3 and Huntington Creek-2 are requested to be removed from the 303d list because these reaches are now meeting the TDS standards (Table 11-3). Assessment results for all AUs for streams are presented in Table 11-4 and for lakes in Table 11-5. Lake assessments are further discussed in the next section.

## 11.3 LAKE ASSESSMENTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends.

Table 11-6 shows TSIs based on each sample collected from May through September by sample date. Table 11-7 contains a summary of lake trophic status by study periods. Note that some of the changes in TSIs between assessment periods are due to the variability in the lakes and reservoirs and some is due to switching methodologies between 2008 and 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). Table 11-7 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. Small differences were observed for Mill Meadow and Wide Hollow Reservoirs. Medium differences were observed for Forsyth and Joes Valley Reservoirs. A large difference was observed for Huntington Lake North. The small and medium differences suggest little difference in trophic state between the new and older methods.

Huntington Lake North is classified oligotrophic whether using the old TSI method or the 2010 IR method. Table 11-6 shows that the TSI-SD is markedly higher than either the TSI-Chla or TSI-TP. This suggests Huntington Lake North is phosphorus limited which is supported by phosphorus concentrations measured in the lake.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. Consistent trends that resulted in a net TSI change of five or changes greater than 10 between 2008 and 2010, which are not attributable to the change in TSI methodology alone, include: Johnson and Mill Meadow Reservoirs that both show an increasing trend in TSI scores. Conversely, Electric Lake and Forsyth Reservoir show a decreasing trend in TSI.

## HEALTH ADVISORIES

Joes Valley Reservoir, Calf Creek, and Pine Creek have fish consumption advisories for mercury.

# TABLES

**Table 11-1 USGS Hydrological Units in the Colorado River West Watershed Management Unit**

| USGS Hydrological Units in the Colorado River West Watershed Management Unit | |
|---|---|
| **Hydrological Unit Code** | **Hydrological Unit Name** |
| 14060007 | Price |
| 14060008 | Lower Green |
| 14060009 | San Rafael |
| 14070001 | Upper Lake Powell |
| 14070002 | Muddy |
| 14070003 | Fremont |
| 14070004 | Dirty Devil |
| 14070005 | Escalante |
| 14070006 | Lower Lake Powell |

**Table 11-2 Impaired Streams and Lakes Requiring a TMDL in the Colorado River West Watershed**

| Impaired Streams and Lakes Requiring a TMDL in the Colorado River West Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060007-007_00 | Price River-3 | RIVER | 16.648 MILES | Price River and tributaries from Coal Creek confluence to Carbon Canal Diversion |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Non-Game Fish and Other Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060009-010_00 | Huntington Creek-1 | RIVER | 25.789 MILES | Huntington Creek and tributaries from confluence with Cottonwood Creek to Highway 10 |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Selenium | 2006 | Low Priority | Non-Game Fish and Other Aquatic Life | • Agriculture<br>• Natural Sources |

| Impaired Streams and Lakes Requiring a TMDL in the Colorado River West Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14060009-013_00 | Upper San Rafael | RIVER | 23.254 MILES | San Rafael River from Buckhorn Crossing to confluence of Huntington and Cottonwood Creeks |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Non-Game Fish and Other Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14070002-002_00 | Upper Quitchipah Creek | RIVER | 29.022 MILES | Quitchipah Creek from U-10 to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL in the Colorado River West Watershed | | | | |
|---|---|---|---|---|
| UT14070002-007_00 | Lower Quitchipah Creek | RIVER | 9.952 MILES | Quitchipah Creek from confluence with Ivie Creek to U-10 crossing |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Non-Game Fish and Other Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14070003-008_00 | Fremont River-3 | RIVER | 82.881 MILES | Fremont River and tributaries from east boundary of Capitol Reef National Park to Bicknell |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14070006-004_00 | Chance Creek | RIVER | 16.719 MILES | Chance Creek and tributaries from Lake Powell to headwaters |

| Impaired Streams and Lakes Requiring a TMDL in the Colorado River West Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14070007-001_00 | Paria River-1 | RIVER | 16.766 MILES | Paria River from start of Paria River Gorge to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2008 | Low Priority | Non-Game Fish and Other Aquatic Life | • Drought-related Impacts<br>• Agriculture |
| Total Dissolved Solids | 2000 | Low Priority | Agricultural | • Natural Sources |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14070007-005_00 | Paria River-3 | RIVER | 9.226 MILES | Paria River and tributaries from Arizona-Utah state line to Cottonwood Creek confluence |

| Impaired Streams and Lakes Requiring a TMDL in the Colorado River West Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Non-Game Fish and Other Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14070003-019_00 | Forsyth Reservoir | FRESHWATER LAKE | 158 ACRES | LL= 383109/113109 26S 3E 24,25 USGS MAP AND DATE: FORSYTH RESERVOIR, UTAH-1968 WATERSHED: UM CREEK, WMU Colorado River West |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** |
| Agricultural | Fully Supporting | N | | |
| Cold Water Aquatic Life | Not Supporting | N | Oxygen, Dissolved<br>Phosphorus (Total) | 2006<br>1992 |
| Secondary Recreation | Not Assessed | N | | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL in the Colorado River West Watershed | | | | |
|---|---|---|---|---|
| UT-L-14060007-004_00 | Lower Gooseberry Reservoir | FRESHWATER LAKE | 57 ACRES | LL= 394230/1111730 13S 6E 6,7 USGS MAP AND DATE: FAIRVIEW LAKES, UTAH-1978 WATERSHED: GOOSEBERRY CREEK , WMU Colorado River Southeast |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved<br>pH<br>Phosphorus (Total) | 2006<br>1992<br>1992 | Low Priority<br>Low Priority<br>Low Priority | Cold Water Aquatic Life<br>Cold Water Aquatic Life<br>Cold Water Aquatic Life | • Managed Pasture Grazing<br>• Other Recreational Pollution Sources<br>• Rangeland Grazing<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14070003-044_00 | Lower Bowns Reservoir | FRESHWATER LAKE | 90 ACRES | LL= 380635/1111612 31S 6E 17 USGS MAP AND DATE: GROVER 15' QUAD.-1952 WATERSHED: OAK CREEK; WMU Colorado River West |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |

| Impaired Streams and Lakes Requiring a TMDL in the Colorado River West Watershed | | | | |
|---|---|---|---|---|
| Oxygen, Dissolved | 2010 | Low Priority | Cold Water Aquatic Life | • Rangeland Grazing |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | |
| pH | 2006 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14070005-011_00 | Wide Hollow Reservoir | FRESHWATER LAKE | 145 ACRES | LL= 374714/1113813 35S 2E 1,2,12 USGS MAP AND DATE: WIDE HOLLOW RESERVOIR, UTAH, QUAD-1964 WATERSHED: ESCALANTE RIVER, WMU Colorado River West |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | |
| pH | 2010 | Low Priority | Cold Water Aquatic Life | |

**Table 11-3 Request for Removal from 303d List – Colorado River West Watershed**

| Request for Removal from 303d List<br>Colorado River West Watershed | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Unit** | **AU Name** | **Location Description** | **Water Type** | **Size** | **Cause** | **Reason for Removal** | **Delisting Comment** |
| UT14070007-005_00 | Paria River-3 | Paria River and tributaries from Arizona-Utah state line to Cottonwood Creek confluence | RIVER | 9.226 MILES | Total Dissolved Solids | Applicable WQS attained; reason for recovery unspecified | N/A |
| UT14060009-004_00 | Huntington Creek-2 | Huntington Creek and tributaries from Highway 10 crossing to USFS boundary | River | 19.241 Miles | Total Dissolved Solids | Applicable WQS attained; due to restoration activities | Approved TMDL, 11137, for TDS and TDS meeting WQS 2010. |

**Table 11-4 Assessment Summary for Colorado River West Watershed Streams**

| Assessment Summary for Colorado River West Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT-L-14060007-004_00 | Lower Gooseberry Reservoir | | FRESHWATER LAKE | 57 ACRES | LL= 394230/1111730 13S 6E 6,7 USGS MAP AND DATE: FAIRVIEW LAKES, UTAH-1978 WATERSHED: GOOSEBERRY CREEK , WMU Colorado River Southeast | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Managed Pasture Grazing<br>• Other Recreational Pollution Sources |
| Cold Water Aquatic Life | Not Supporting | N | Oxygen, Dissolved<br>pH<br>Phosphorus (Total) | 2006<br>1992<br>1992 | Low Priority<br>Low Priority<br>Low Priority | • Rangeland Grazing<br>• Source Unknown |

| Assessment Summary for Colorado River West Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT-L-14060007-005_00 | Scofield Reservoir | | FRESHWATER LAKE | 2815 ACRES | LL= 394610/1110910 12S 7E 4,9,10,16,17,18,20,21,28,29 USGS MAP AND DATE: SCOFIELD RES. QUAD-1978 WATERSHED: PRICE RIVER, WMU Colorado River West | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural | Fully Supporting | N | | | | • Industrial Point Source Discharge<br>• Managed Pasture Grazing |
| Cold Water Aquatic Life | Not Supporting | N | Oxygen, Dissolved<br>pH<br>Phosphorus (Total) | 2006<br>2006<br>1994 | Completed<br>Completed<br>Completed | • Other Recreational Pollution Sources<br>• Septage Disposal<br>• Subsurface (Hardrock) Mining |
| Domestic Water Supply | Fully Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

## Assessment Summary for Colorado River West Watershed Streams

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT-L-14070003-010_00 | Johnson Valley Reservoir | FRESHWATER LAKE | 704 ACRES | LL= 383605/1113800 25S 2,3E 23-26,30 USGS MAP AND DATE: FISHLAKE, 1968 WATERSHED: FREMONT RIVER, WMU Colorado River West |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | Phosphorus (Total) | 1992 | Completed | • Managed Pasture Grazing<br>• Other Recreational Pollution Sources<br>• Source Unknown |
| Cold Water Aquatic Life | Not Supporting | N | | | | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT-L-14070003-015_00 | Mill Meadow Reservoir | FRESHWATER LAKE | 156 ACRES | LL= 383024/1113353 26N 3E 27,34,35 USGS MAP AND DATE: FORSYTH RESERVOIR, UTAH-1968 WATERSHED: UM CREEK, WMU Colorado River West |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|

| Assessment Summary for Colorado River West Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural<br><br>Cold Water Aquatic Life<br><br>Secondary Recreation | Fully Supporting<br><br>Not Supporting<br><br>Not Assessed | N<br><br>N<br><br>N | Phosphorus (Total) | 1992 | Completed | • Grazing in Riparian or Shoreline Zones<br>• Other Recreational Pollution Sources<br>• Rangeland Grazing<br>• Silviculture Plantation Management |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT-L-14070003-019_00 | Forsyth Reservoir | | FRESHWATER LAKE | 158 ACRES | LL= 383109/113109 26S 3E 24,25 USGS MAP AND DATE: FORSYTH RESERVOIR, UTAH-1968 WATERSHED: UM CREEK, WMU Colorado River West | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **TMDL Status** | **Source** |
| Agricultural<br><br>Cold Water Aquatic Life<br><br>Secondary Recreation | Fully Supporting<br><br>Not Supporting<br><br>Not Assessed | N<br><br>N<br><br>N | Oxygen, Dissolved<br>Phosphorus (Total) | 2006<br>1992 | Completed<br>Completed | • Grazing in Riparian or Shoreline Zones<br>• Managed Pasture Grazing<br>• Other Recreational Pollution Sources<br>• Rangeland Grazing |

## Assessment Summary for Colorado River West Watershed Streams

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT-L-14070003-044_00 | Lower Bowns Reservoir | FRESHWATER LAKE | 90 ACRES | LL= 380635/1111612 31S 6E 17 USGS MAP AND DATE: GROVER 15' QUAD.-1952 WATERSHED: OAK CREEK; WMU Colorado River West |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | • Rangeland Grazing |
| Cold Water Aquatic Life | Not Supporting | N | Oxygen, Dissolved<br>pH<br>Temperature, water | 2010<br>2006<br>2010 | Low Priority<br>Low Priority<br>Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT-L-14070005-011_00 | Wide Hollow Reservoir | FRESHWATER LAKE | 145 ACRES | LL= 374714/1113813 35S 2E 1,2,12 USGS MAP AND DATE: WIDE HOLLOW RESERVOIR, UTAH, QUAD-1964 WATERSHED: ESCALANTE RIVER, WMU Colorado River West |

| Use | Attainment | Threatened | Cause | Cycle First Listed | TMDL Status | Source |
|---|---|---|---|---|---|---|

| Assessment Summary for Colorado River West Watershed Streams | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | | |
| Cold Water Aquatic Life | Not Supporting | N | pH<br>Temperature, water | 2010<br>2010 | Low Priority<br>Low Priority | |
| Secondary Recreation | Not Assessed | N | | | | |

**Table 11-5 Assessment Results for Colorado River West Watershed Management Unit Lakes**

## *Assessment Results for Colorado River West Watershed Management Unit Lakes*

| | | | | | *Parameters Not Supporting 2010* | | | | | | | *Assessment Cycle* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Assessment Unit ID* | *Name* | *Assessment Category 2008* | *Assessment Category 2010* | *Parameters Not Supporting 2008* | *DO* | *pH* | *T* | *Other* | *Total P > 0.025 mg/L or TSI>50* | *Winter DO/Fish Kills* | *Cyano Bacteria Present* | *2002* | *2004* | *2006* | *2008* | *2010* |
| ***UT-L-14060009-024*** | ***Cleveland Reservoir*** | ***2*** | ***3B*** | | ***FS*** | ***FS*** | ***NS*** | | ***No*** | | ***Y*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | ***NS*** |
| ***UT-L-14070003-018*** | ***Cook Lake*** | ***2*** | ***2*** | | | | | | ***ND*** | | ***ND*** | ***NS*** | ***FS*** | ***FS*** | ***FS*** | |
| ***UT-L-14070003-027*** | ***Donkey Reservoir*** | ***2*** | ***2*** | | | | | | ***ND*** | | ***N*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | |
| ***UT-L-14060009-003*** | ***Duck Fork Reservoir*** | ***2*** | ***2*** | | | | | | ***ND*** | ***DO*** | ***N*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | |
| ***UT-L-14060009-025*** | ***Electric Lake*** | ***2*** | ***3B*** | | ***FS*** | ***FS*** | ***NS*** | | ***No*** | | ***Y*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | ***NS*** |

## Assessment Results for Colorado River West Watershed Management Unit Lakes

| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010: DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | Assessment Cycle: 2002 | 2004 | 2006 | 2008 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***UT-L-14060007-001*** | ***Fairview Lake #2*** | ***2*** | ***2*** | | | | | | ***ND*** | | ***N*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | |
| ***UT-L-14060009-001*** | ***Ferron Reservoir*** | ***2*** | ***2*** | | | | | | ***ND*** | | ***N*** | ***FS*** | ***FS*** | ***NS*** | ***FS*** | |
| ***UT-L-14070003-006*** | ***Fish Lake*** | ***2*** | ***2*** | | ***FS*** | ***FS*** | ***FS*** | | ***No*** | | ***N*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** |
| ***UT-L-14070003-019*** | ***Forsyth Reservoir*** | ***4A*** | ***4A*** | | ***FS*** | ***FS*** | ***FS*** | | ***No*** | | ***N*** | ***NS*** | ***NS*** | ***NS*** | ***NS*** | ***FS*** |
| ***UT-L-14060009-034*** | ***Huntington Lake North*** | ***2*** | ***2*** | | ***FS*** | ***FS*** | ***FS*** | | ***No*** | | ***N*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** |

## Assessment Results for Colorado River West Watershed Management Unit Lakes

| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010 | | | | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DO | pH | T | Other | | | | 2002 | 2004 | 2006 | 2008 | 2010 |
| ***UT-L-14060009-018*** | ***Huntington Reservoir*** | ***2*** | ***2*** | | | | | | | | ***N*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | |
| ***UT-L-14060009-017*** | ***Joes Valley Reservoir*** | ***2*** | ***3B*** | | ***FS*** | ***NS*** | ***NS*** | | ***No*** | | ***N*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | ***NS*** |
| ***UT-L-14070003-010*** | ***Johnson Valley Reservoir*** | ***4*** | ***4A*** | | ***FS*** | ***FS*** | ***FS*** | | ***TP, TSI*** | ***DO*** | ***Y*** | ***NS*** | ***NS*** | ***NS*** | ***FS*** | ***FS*** |
| ***UT-L-14070006-001*** | ***Lake Powell*** | ***1*** | ***1*** | | ***FS*** | ***FS*** | ***FS*** | | | | ***ND*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** |
| ***UT-L-14070003-044*** | ***Lower Bowns Reservoir*** | ***5*** | ***5, 3B*** | ***pH*** | ***NS*** | ***NS*** | ***NS*** | | ***TP*** | | ***Y*** | ***FS*** | ***NS*** | ***NS*** | ***NS*** | ***NS*** |

## Assessment Results for Colorado River West Watershed Management Unit Lakes

| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010 | | | | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DO | pH | T | Other | | | | 2002 | 2004 | 2006 | 2008 | 2010 |
| ***UT-L-14060007-004*** | ***Lower Gooseberry Reservoir*** | ***5*** | ***5*** | | ***FS*** | ***FS*** | ***FS*** | | ***No*** | ***DO/FK*** | ***Y*** | ***NS*** | ***NS*** | ***NS*** | ***FS*** | ***FS*** |
| ***UT-L-14070003-015*** | ***Mill Meadow Reservoir*** | ***4*** | ***4*** | ***pH*** | ***FS*** | ***FS*** | ***FS*** | | ***TP, TSI*** | | ***Y*** | ***NS*** | ***NS*** | ***NS*** | ***NS*** | ***FS*** |
| ***UT-L-14060009-023*** | ***Miller Flat Reservoir*** | ***2*** | ***2*** | | | | | | | | ***Y*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | |
| ***UT-L-14060009-026*** | ***Millsite Reservoir*** | ***2*** | ***2*** | | | | | | | | ***N*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | |
| ***UT-L-14070005-008*** | ***Posey Lake*** | ***2*** | ***2*** | ***FS*** | | | | | | | ***N*** | ***FS*** | ***FS*** | ***FS*** | ***FS*** | |

## *Assessment Results for Colorado River West Watershed Management Unit Lakes*

| | | | | | *Parameters Not Supporting 2010* | | | | | | | *Assessment Cycle* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Assessment Unit ID* | *Name* | *Assessment Category 2008* | *Assessment Category 2010* | *Parameters Not Supporting 2008* | *DO* | *pH* | *T* | *Other* | *Total P > 0.025 mg/L or TSI>50* | *Winter DO/Fish Kills* | *Cyano Bacteria Present* | *2002* | *2004* | *2006* | *2008* | *2010* |
| ***UT-L-14060007-005*** | ***Scofield Reservoir*** | ***4*** | ***4*** | ***FS*** | | | | | ***No*** | | ***Y*** | ***NS*** | ***NS*** | ***NS*** | ***FS*** | |
| ***UT-L-14070005-011*** | ***Wide Hollow Reservoir*** | ***5*** | ***5*** | ***T, pH*** | ***FS*** | ***NS*** | ***NS*** | | ***No*** | | ***N*** | ***NS*** | ***NS*** | ***NS*** | ***NS*** | ***NS*** |

## *Assessment Results for Colorado River West Watershed Management Unit Lakes*

| | | | | | *Parameters Not Supporting 2010* | | | | | | | *Assessment Cycle* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Assessment Unit ID* | *Name* | *Assessment Category 2008* | *Assessment Category 2010* | *Parameters Not Supporting 2008* | *DO* | *pH* | *T* | *Other* | *Total P > 0.025 mg/L or TSI>50* | *Winter DO/Fish Kills* | *Cyano Bacteria Present* | *2002* | *2004* | *2006* | *2008* | *2010* |

*Notes:*

***FS Fully Supporting***

***NS Not Supporting***

***Y Yes***

***N No***

***DO Dissolved Oxygen***

***FK Fish Kill***

***T Temperature***

***Total P Total Phosphorus***

***NA Not Analyzed***

***TDS Total Dissolved Solids***

**Table 11-6 Individual Lake and Reservoir 2010 Trophic State Index (TSI)**

| Individual Lake and Reservoir 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Colorado River West | UT-L-14060009-024 | Cleveland Reservoir | 7/31/2007 | 45 | 43 | 48 |
| Colorado River West | UT-L-14060009-025 | Electric Lake | 7/31/2007 | 40 | 34 | 37 |
| Colorado River West | UT-L-14070003-006 | Fish Lake | 9/24/2008 | 33 | 40 | 37 |
| Colorado River West | UT-L-14070003-019 | Forsyth Reservoir | 7/6/2007 | 37 | 8 | |
| Colorado River West | UT-L-14060009-034 | Huntington Lake North | 8/16/2007 | 56 | 8 | 37 |
| Colorado River West | UT-L-14060009-017 | Joes Valley Reservoir | 8/1/2007 | 45 | 19 | 37 |

| Individual Lake and Reservoir 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Colorado River West | UT-L-14070003-010 | Johnson Valley Reservoir | 8/1/2007 | 70 | 68 | 63 |
| Colorado River West | UT-L-14070003-044 | Lower Bowns Reservoir | 7/11/2007 | 40 | 41 | 37 |
| Colorado River West | UT-L-14070003-044 | Lower Bowns Reservoir | 6/25/2008 | 45 | 38 | 37 |
| Colorado River West | UT-L-14070003-044 | Lower Bowns Reservoir | 7/22/2008 | 41 | 37 | 61 |
| Colorado River West | UT-L-14070003-044 | Lower Bowns Reservoir | 8/6/2008 | 47 | 41 | 37 |
| Colorado River West | UT-L-14070003-044 | Lower Bowns Reservoir | 9/23/2008 | 51 | 63 | 53 |
| Colorado River West | UT-L-14060007-004 | Lower Gooseberry Reservoir | 7/31/2007 | 48 | 40 | 37 |

| Individual Lake and Reservoir 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Colorado River West | UT-L-14070003-015 | Mill Meadow Reservoir | 8/1/2007 | 66 | 77 | 64 |
| Colorado River West | UT-L-14060007-005 | Scofield Reservoir | 7/23/2007 | 47 | 34 | 47 |
| Colorado River West | UT-L-14060007-005 | Scofield Reservoir | 7/23/2007 | | 34 | 47 |
| Colorado River West | UT-L-14070005-011 | Wide Hollow Reservoir | 6/28/2007 | 37 | 35 | 38 |
| Colorado River West | UT-L-14070005-011 | Wide Hollow Reservoir | 7/22/2008 | | | 62 |

Notes:

TSI-SD = Trophic State Index from secchi disk

TSI-Chla = Trophic State Index from chlorophyll-a

TSI-TP = Trophic State Index from total phosphorus

**Table 11-7 Summary of Individual Lake and Reservoir Trophic State Index (TSI)**

| Summary of Individual Lake and Reservoir Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Colorado River West | UT-L-14060009-024 | Cleveland Reservoir | 42 | 52 | 43 | 36 | 47 | 47 | 39 | 50 | 45 | 43 | M | M |
| Colorado River West | UT-L-14060009-025 | Electric Lake Reservoir | 39 | 50 | 44 | 40 | 44 | 48 | 40 | NA | 37 | 34 | O | O |
| Colorado River West | UT-L-14070003-006 | Fish Lake | 41 | 40 | 34 | 34 | 34 | 36 | 36 | 35 | 37 | 40 | O | M |
| Colorado River West | UT-L-14070003-019 | Forsyth Reservoir | 62 | 53 | 57 | 49 | 55 | 51 | 46 | 50 | 27 | 8 | O | O |
| Colorado River West | UT-L-14060009-034 | Huntington Lake North | 37 | 45 | 38 | 35 | 44 | 46 | 31 | 35 | 34 | 8 | O | O |
| Colorado River West | UT-L-14060009-017 | Joes Valley Reservoir | 31 | 35 | 32 | 37 | 44 | 41 | 35 | 50 | 34 | 19 | O | O |

| Summary of Individual Lake and Reservoir Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Colorado River West | UT-L-14070003-010 | Johnson Reservoir | 64 | 68 | 65 | 64 | 58 | 60 | 64 | 60 | 67 | 68 | E | E |
| Colorado River West | UT-L-14070003-044 | Lower Bowns Reservoir | 50 | 41 | 47 | 48 | 41 | 40 | 44 | 56 | 39 | 44 | O | M |
| Colorado River West | UT-L-14060007-004 | Lower Gooseberry Reservoir | 46 | 44 | 41 | 40 | 46 | 45 | 38 | 45 | 42 | 40 | M | M |
| Colorado River West | UT-L-14070003-015 | Mill Meadow Reservoir | 67 | 69 | 56 | 60 | 50 | 56 | 46 | 63 | 69 | 77 | E | H |
| Colorado River West | UT-L-14060007-005 | Scofield Reservoir | 63 | 56 | 53 | 42 | 45 | 46 | 44 | 52 | 43 | 34 | M | O |

| Summary of Individual Lake and Reservoir Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Colorado River West | UT-L-14070005-011 | Wide Hollow Reservoir | 46 | 44 | 48 | 41 | 41 | DRY | DRY | 39 | 43 | 35 | M | O |

Notes:

2010 Old Method TSI calculated using the 2008 Integrated Report Methodology

2010 Current Method TSI calculated using the 2010 Integrated Report Methodology of only chlorophyll-a

O = Oligotrophic

M = Mesotrophic

E = Eutrophic

H = Hypereutrophic

# Figures

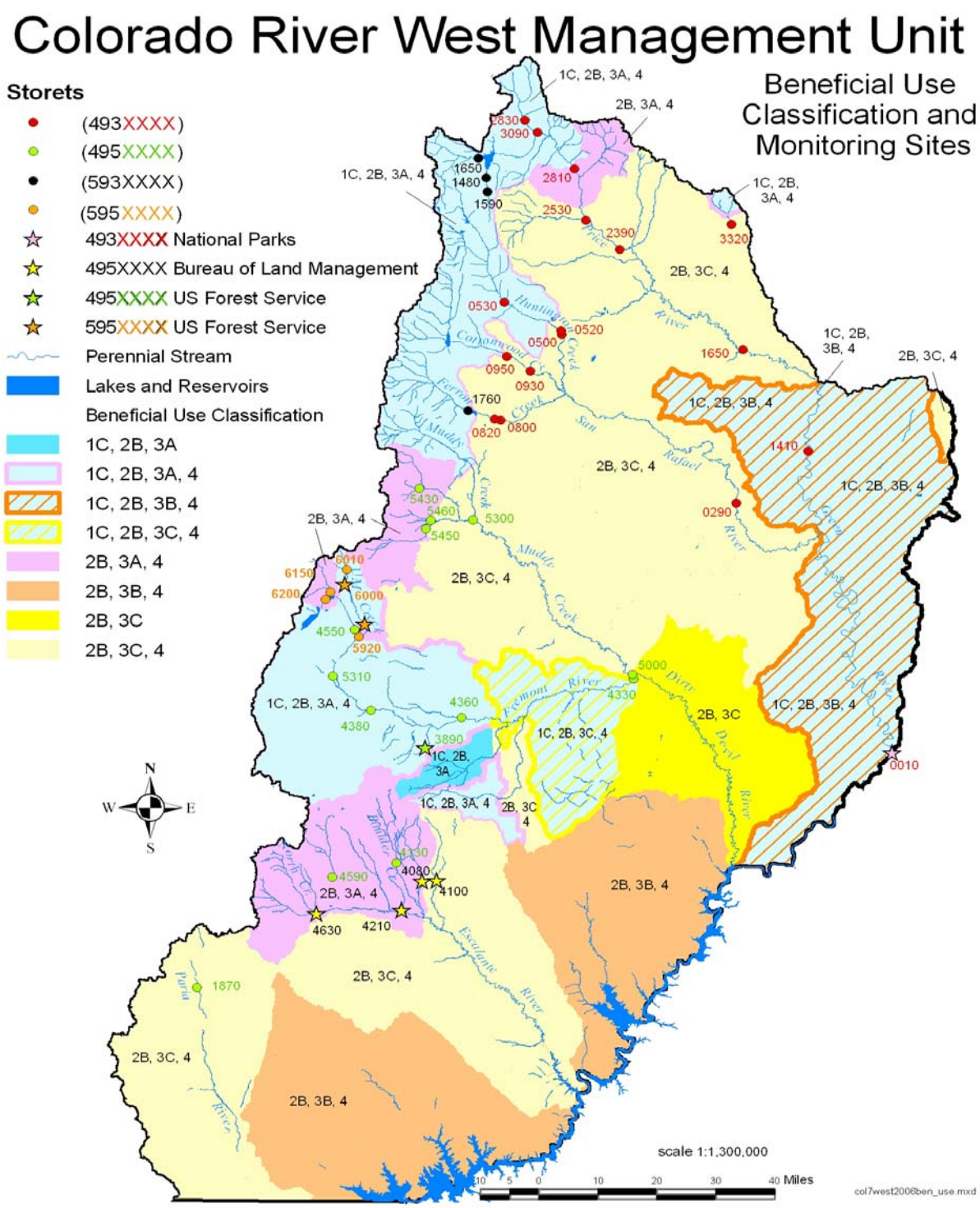


**Figure 11-1 Beneficial Use Classes for Colorado River West Watershed Management Unit**

# CHAPTER 12: COLORADO RIVER SOUTHEAST WATERSHED MANAGEMENT UNIT

## 12.1 INTRODUCTION

The Colorado River Southeast Watershed Management Unit (WMU) includes all streams located in the USGS Hydrological Units (HUCs) listed in Table 12-1. Some of the major streams in this WMU include: San Juan River, Dolores River, Mill Creek, Montezuma Creek, La Sal River, Geyser Creek and part of the Colorado River.

Biological, water chemistry and field data collected from January 1, 2004 through December 31, 2008 were used to make assessments. Water quality data were compared against standards established for each of the designated beneficial uses. Figure 12-1 shows the beneficial use classes for this watershed management unit.

## 12.2 IMPAIRED WATERS

The list of streams and lakes impaired and requiring a TMDL (Category 5; Section 303d) for the Colorado River Southeast are presented in Table 12-2. New listings for 2010 include Comb Wash, Cottonwood Wash, Westwater Creek, Pack Creek, Johnson Creek, and Recapture Reservoir. Assessment results for all stream AUs are presented in Table 12-3 and for lakes in Table 12-4. Lake assessments are further discussed in the next section.

## 12.3 LAKE ASSESSMENTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends.

Table 12-5 shows TSIs based on each sample collected from May through September by sample date. Table 12-6 contains a summary of lake trophic status by study periods. Note that some of the changes in TSIs between assessment periods are due to the variability in the lakes and reservoirs and some is due to switching methodologies between 2008 and 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). Table 12-6 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. Small differences were observed for Lloyds and Recapture Reservoirs. These small differences suggest little difference in trophic state between the new and older methods.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. No obvious trends in TSIs were observed among lakes in this watershed.

## 12.4 HEALTH ADVISORIES

Mill Creek-1 has a fish consumption advisory for mercury.

# Tables

**Table 12-1 USGS Hydrological Units in the Colorado River Southeast Watershed Management Unit**

| USGS Hydrological Units in the Colorado River Southeast Watershed Management Unit | |
|---|---|
| **Hydrological Unit Code** | **Hydrological Unit Name** |
| 14010005 | Colorado Headwaters/Plateau Utah |
| 14030001 | Westwater Canyon |
| 14030002 | Upper Delores |
| 14030004 | Lower Delores |
| 14030005 | Upper Colorado-Kane Springs |
| 14070006 | Lower Lake Powell |
| 14070007 | Paria |
| 14080201 | Lower San Juan-Four Corners Southeast |
| 14080202 | McElmo |
| 14080203 | Montezuma |
| 14080204 | Chinle |
| 14080205 | Lower San Juan |

**Table 12-2 Impaired Streams and Lakes Requiring a TMDL – Colorado River Southeast Watershed**

| Impaired Streams and Lakes Requiring a TMDL - Colorado River Southeast Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14080201-011_00 | Comb Wash | STREAM | 31.6 | Comb Wash and tributaries from the confluence with San Juan River to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Warm Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14010005-001_00 | Colorado River-6 | RIVER | 3.84 MILES | Colorado River from HUC 14010005-14030001 boundary to Colorado State Line |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Selenium | 2006 | Medium Priority | Warm Water Aquatic Life | • Sources Outside State Jurisdiction or Borders |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL - Colorado River Southeast Watershed | | | | |
|---|---|---|---|---|
| UT14030001-001_00 | Cottonwood Wash | RIVER | 20.869 MILES | Cottonwood Wash from Colorado River confluence to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14030001-003_00 | Westwater Creek | RIVER | 0.01 MILES | Westwater Creek and tributaries from confluence with Colorado River to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Cold Water Aquatic Life | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14030001-005_00 | Colorado River-5 | RIVER | 33.895 MILES | Colorado River from Dolores River confluence to HUC 14010005 boundary |

| Impaired Streams and Lakes Requiring a TMDL - Colorado River Southeast Watershed | | | | |
|---|---|---|---|---|
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Selenium | 2006 | Medium Priority | Warm Water Aquatic Life | • Sources Outside State Jurisdiction or Borders |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14030004-001_00 | Dolores River | RIVER | 61.727 MILES | Dolores River and tributaries (except Granite Creek) from confluence with Colorado River to headwaters or Utah-Colorado state line |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Total Dissolved Solids | 2008 | Low Priority | Agricultural | • Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14030005-003_00 | Colorado River-3 | RIVER | 62.688 MILES | Colorado River from Green River confluence to Moab |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Selenium | 2006 | Medium Priority | Warm Water Aquatic Life | • Sources Outside State Jurisdiction or Borders |

| Impaired Streams and Lakes Requiring a TMDL - Colorado River Southeast Watershed | | | | |
|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14030005-004_00 | Colorado River-4 | RIVER | 35.767 MILES | Colorado River from Moab to HUC unit (14030005) boundary |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Selenium | 2006 | Medium Priority | Warm Water Aquatic Life | • Sources Outside State Jurisdiction or Borders |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14030005-009_00 | Castle Creek-1 | RIVER | 9.1 MILES | Castle Creek and tributaries from confluence with Colorado River to Seventh-Day Adventist diversion |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2008 | Low Priority | Warm Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14030005-011_00 | Pack Creek | RIVER | 15.214 MILES | Pack Creek and tributaries from the confluence with Mill Creek to USFS |

| Impaired Streams and Lakes Requiring a TMDL - Colorado River Southeast Watershed | | | | |
|---|---|---|---|---|
| | | | | boundary |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Selenium<br><br>Temperature, water | 2010<br><br>2006 | Low Priority<br><br>Medium Priority | Cold Water Aquatic Life<br><br>Cold Water Aquatic Life | • Natural Sources<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT14030005-013_00 | Onion Creek Upper | RIVER | 2.198 MILES | Onion Creek and tributaries from road crossing above Stinking Springs to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Total Dissolved Solids | 2008 | Low Priority | Agricultural | • Agriculture<br>• Natural Sources<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL - Colorado River Southeast Watershed | | | | |
|---|---|---|---|---|
| UT14080201-004_00 | Johnson Creek | RIVER | 3.894 MILES | Johnson Creek and tributaries from confluence with Recapture Creek to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | • Natural Sources<br>• Source Unknown |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
| UT-L-14080201-007_00 | Recapture Reservoir | FRESHWATER RESERVOIR | 17 ACRES | TOWNSHIP: 36S RANGE: 22E SECTION: 10 USGS MAP AND DATE: BLANDING-1962, WMU Colorado River Southeast |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Oxygen, Dissolved | 2006 | Low Priority | Cold Water Aquatic Life | |
| Temperature, water | 2010 | Low Priority | Cold Water Aquatic Life | |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |

| Impaired Streams and Lakes Requiring a TMDL - Colorado River Southeast Watershed | | | | |
|---|---|---|---|---|
| UT-L-14080203-002_00 | MONTICELLO LAKE | FRESHWATER LAKE | 3 ACRES | LL= 375340/1092800 33S 22E 23 USGS MAP AND DATE: MONTICELLO, UTAH-1957 WATERSHED: SPRING CREEK, WMU Colorado River Southeast |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| pH | 2006 | Low Priority | Cold Water Aquatic Life | |

**Table 12-3 Assessment Results for Streams – Colorado River Southeast Watershed**

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14010005-001_00 | Colorado River-6 | | RIVER | 3.84 MILES | Colorado River from HUC 14010005-14030001 boundary to Colorado State Line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Supporting | N | Selenium | 2006 | Warm Water Aquatic Life | Not Supporting |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| UT14010005-002_00 | Unknown tribs | | RIVER | 0.01 MILES | Unknown tributaries from HUC boundary (14010005) to Utah-Colorado state line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Assessed | N | | | Warm Water Aquatic Life | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030001-001_00 | Cottonwood Wash | | RIVER | 20.869 MILES | Cottonwood Wash from Colorado River confluence to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2010 | Cold Water Aquatic Life | Not Supporting |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT14030001-002_00 | Little Dolores Rive | RIVER | 0.01 MILES | Little Dolores River from confluence with Colorado River to Utah-Colorado state line |

| Use | Attainment | Threatened | Cause | Cycle First Listed | Use | Attainment |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Cold Water Aquatic Life | Not Assessed | N | | | Cold Water Aquatic Life | Not Assessed |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030001-003_00 | Westwater Creek | | RIVER | 0.01 MILES | Westwater Creek and tributaries from confluence with Colorado River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Cold Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessments | 2010 | Cold Water Aquatic Life | Not Supporting |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030001-004_00 | Bitter Creek | | RIVER | 0.01 MILES | Bitter Creek and tributaries from Colorado River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Non-Game Fish and Other Aquatic Life | Not Assessed | N | | | Non-Game Fish and Other Aquatic Life | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030001-005_00 | Colorado River-5 | | RIVER | 33.895 MILES | Colorado River from Dolores River confluence to HUC 14010005 boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Fully | N | | | Agricultural | Fully Supporting |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Supporting | N | | | Domestic Water Supply | Fully Supporting |
| Secondary Recreation | Fully Supporting | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Assessed | N | Selenium | 2006 | Warm Water Aquatic Life | Not Supporting |
| | Not Supporting | | | | | |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT14030001-060_00 | Undefined Waterbodies (CU 14030001) | RIVER INTERMITTENT | 5.94 MILES | Area of undefined waterbodies |

| Use | Attainment | Threatened | Cause | Cycle First Listed | Use | Attainment |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Cold Water Aquatic Life | Not Assessed | N | | | Cold Water Aquatic Life | Not Assessed |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030001-061_00 | Undefined Waterbodies (CU 14030001) | | RIVER INTERMITTENT | 0.48 MILES | Area of undefined waterbodies | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Cold Water Aquatic Life | Not Assessed | N | | | Cold Water Aquatic Life | Not Assessed |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| UT14030001-063_00 | Undefined Waterbodies (CU 14030001) | | RIVER INTERMITTENT | 0 MILES | Area of undefined waterbodies | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Cold Water Aquatic Life | Not Assessed | N | | | Cold Water Aquatic Life | Not Assessed |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030002-001_00 | LaSal Creek | | RIVER | 18 MILES | LaSal Creek and tributaries from Utah-Colorado state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Cold Water Aquatic Life | Fully Supporting | N | | | Cold Water Aquatic Life | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030002-002_00 | Roc Creek | | RIVER | 20.222 MILES | Roc Creek and tributaries from Utah-Colorado state line to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Cold Water Aquatic Life | Not Assessed | N | | | Cold Water Aquatic Life | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030004-001_00 | Dolores River | | RIVER | 61.727 MILES | Dolores River and tributaries (except Granite Creek) from confluence with Colorado River to headwaters or Utah-Colorado state line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2008 | Agricultural | Not Supporting |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | Non-Game Fish and Other Aquatic Life | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030004-002_00 | Granite Creek | | RIVER | 9.478 MILES | Granite Creek and tributaries from confluence with Dolores River to Utah-Colorado state line | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Non-Game Fish and Other Aquatic Life | Fully Supporting | N | | | Non-Game Fish and Other Aquatic Life | Fully Supporting |
| Primary Recreation | Not Assessed | N | | | Primary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030005-001_00 | Kane Spring Wash | | RIVER | 48.844 MILES | Kane Spring Wash from confluence with Colorado River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Non-Game Fish and Other Aquatic Life | Not Assessed | N | | | Non-Game Fish and Other Aquatic Life | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030005-002_00 | Indian Creek-2 | | RIVER | 15.498 MILES | Indian Creek and tributaries from Newspaper Rock north boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Cold Water Aquatic Life | Fully Supporting | N | | | Cold Water Aquatic Life | Fully Supporting |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030005-003_00 | Colorado River-3 | | RIVER | 62.688 MILES | Colorado River from Green River confluence to Moab | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Supporting | N | Selenium | 2006 | Warm Water Aquatic Life | Not Supporting |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030005-004_00 | Colorado River-4 | | RIVER | 35.767 MILES | Colorado River from Moab to HUC unit (14030005) boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Supporting | N | Selenium | 2006 | Warm Water Aquatic Life | Not Supporting |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT14030005-005_00 | Mill Creek-1 | RIVER | 31.769 MILES | Mill Creek and tributaries, except Pack Creek, from the confluence with Colorado River to USFS boundary |

| Use | Attainment | Threatened | Cause | Cycle First Listed | Use | Attainment |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2008 | Cold Water Aquatic Life | Not Supporting |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | Fully Supporting |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030005-006_00 | Mill Creek-2 | | RIVER | 29.614 MILES | Mill Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Cold Water Aquatic Life | Fully Supporting | N | | | Cold Water Aquatic Life | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030005-007_00 | Salt Wash | | RIVER | 22.907 MILES | Salt Wash and tributaries from confluence with Colorado River to headwaters | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Assessed | N | | | Warm Water Aquatic Life | Not Assessed |

| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
|---|---|---|---|---|
| UT14030005-008_00 | Negro Bill | RIVER | 10.115 MILES | Negro Bill Creek from confluence with Colorado River to headwaters |

| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Assessed | N | | | Warm Water Aquatic Life | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030005-009_00 | Castle Creek-1 | | RIVER | 9.1 MILES | Castle Creek and tributaries from confluence with Colorado River to Seventh-Day Adventist diversion | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Supporting | N | Benthic-Macroinvertebrate Bioassessme | 2008 | Warm Water Aquatic Life | Not Supporting |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| | | | nts | | | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030005-010_00 | Onion Creek Lower | | RIVER | 7.973 MILES | Onion Creek and tributaries from confluence with Colorado River to road crossing above Stinking Springs | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Supporting | N | Temperature, water | 2006 | Warm Water Aquatic Life | Not Supporting |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| UT14030005-011_00 | Pack Creek | | RIVER | 15.214 MILES | Pack Creek and tributaries from the confluence with Mill Creek to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2006 | Agricultural | Not Supporting |
| Cold Water Aquatic Life | Not Supporting | N | Selenium | 2010<br>2006 | Cold Water Aquatic Life | Not Supporting |
| Secondary Recreation | Not Assessed | N | Temperature, water | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030005-012_00 | Castle Creek-2 | | RIVER | 9.14 MILES | Castle Creek and tributaries from Seventh-Day Adventist diversion to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Fully Supporting | N | | | Warm Water Aquatic Life | Fully Supporting |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14030005-013_00 | Onion Creek Upper | | RIVER | 2.198 MILES | Onion Creek and tributaries from road crossing above Stinking Springs to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | **Attainment** |
| Agricultural | Not Supporting | N | Total Dissolved Solids | 2008 | Agricultural | Not Supporting |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | Fully Supporting |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Supporting | N | Temperature, water | 2006 | Warm Water Aquatic Life | Not Supporting |

| AU ID | AU Name | Water Type | Size | Location Description |
|---|---|---|---|---|
| UT14030005-044_00 | Undefined Waterbodies (CU 14030005) | RIVER INTERMITTENT | 37.46 MILES | Area of undefined waterbodies |

| Use | Attainment | Threatened | Cause | Cycle First Listed | Use | Attainment |
|---|---|---|---|---|---|---|
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Cold Water Aquatic Life | Not Assessed | N | | | Cold Water Aquatic Life | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | | | | | | |
| UT14030005-045_00 | Undefined Waterbodies (CU 14030005) | | RIVER INTERMITTENT | 0 MILES | Area of undefined waterbodies | |
| **Use** | **Attainment** | | **Threatened** | **Cause** | **Cycle First Listed** | |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Non-Game Fish and Other Aquatic Life | Not Assessed | N | | | Non-Game Fish and Other Aquatic Life | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** | **AU ID** | **AU Name** |
| UT14030005-046_00 | Undefined Waterbodies (CU 14030005) | | RIVER INTERMITTENT | 0.9 MILES | Area of undefined waterbodies | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | | **Threatened** | **Cause** | **Cycle First Listed** | |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Non-Game Fish and Other Aquatic Life | Not Assessed | N | | | Non-Game Fish and Other Aquatic Life | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** | **AU ID** | **AU Name** |
| UT14030005-052_00 | Undefined Waterbodies (CU 14030005) | | RIVER INTERMITTENT | 4.97 MILES | Area of undefined waterbodies | |
| **Use** | **Attainment** | | **Threatened** | **Cause** | **Cycle First Listed** | |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Assessed | N | | | Warm Water Aquatic Life | Not Assessed |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** | **AU ID** | **AU Name** |
| UT14030005-058_00 | Undefined Waterbodies (CU 14030005) | | RIVER INTERMITTENT | 0 MILES | Area of undefined waterbodies | |
| **Use** | **Attainment** | | **Threatened** | **Cause** | **Cycle First Listed** | |
| Agricultural | Not Assessed | N | | | Agricultural | Not Assessed |
| Cold Water Aquatic Life | Not Assessed | N | | | Cold Water Aquatic Life | Not Assessed |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | Not Assessed |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** | **AU ID** | **AU Name** |
| UT14010005-001_00 | Colorado River-6 | | RIVER | 3.84 MILES | Colorado River from HUC 14010005-14030001 boundary to Colorado State Line | |
| **Use** | **Attainment** | | **Threatened** | **Cause** | **Cycle First Listed** | |
| Agricultural | Fully Supporting | N | | | Agricultural | Fully Supporting |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | Fully Supporting |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | Not Assessed |
| Warm Water Aquatic Life | Not Supporting | N | Selenium | 2006 | Warm Water Aquatic Life | Not Supporting |
| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** | **AU ID** | **AU Name** |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| UT14080201-001_00 | Butler Wash | | RIVER | 7.664 MILES | Butler Wash and tributaries from confluence with San Juan River to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |
| Agricultural | Not Assessed | N | | | Agricultural | |
| Cold Water Aquatic Life | Not Assessed | N | | | Cold Water Aquatic Life | |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14080201-002_00 | Cottonwood Wash-1 | | RIVER | 0.01 MILES | Cottonwood Wash and tributaries from confluence with San Juan River to Westwater Creek confluence | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |
| Agricultural | Fully Supporting | N | | | Agricultural | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | |
| Warm Water Aquatic Life | Fully Supporting | N | | | Warm Water Aquatic Life | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14080201-003_00 | Recapture Creek-2 | | RIVER | 3.989 MILES | Recapture Creek and tributaries from USFS boundary to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |
| Agricultural | Not Assessed | N | | | Agricultural | |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Warm Water Aquatic Life | Not Assessed | N | | | Warm Water Aquatic Life | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14080201-004_00 | Johnson Creek | | RIVER | 3.894 MILES | Johnson Creek and tributaries from confluence with Recapture Creek to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |
| Agricultural | Fully Supporting | N | | | Agricultural | |
| Cold Water Aquatic Life | Not Supporting | N | Temperature, water | 2010 | Cold Water Aquatic Life | |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| UT14080201-005_00 | Recapture Creek-1 | | RIVER | 0.01 MILES | Recapture Creek and tributaries from confluence with San Juan River to USFS boundary, except Johnson Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |
| Agricultural | Fully Supporting | N | | | Agricultural | |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | |
| Warm Water Aquatic Life | Fully Supporting | N | | | Warm Water Aquatic Life | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14080201-006_00 | Cottonwood Wash-2 | | RIVER | 4.63 MILES | Cottonwood Wash from Westwater confluence to USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Agricultural | Fully Supporting | N | | | Agricultural | |
| Domestic Water Supply | Not Supporting | N | Radium | 2000 | Domestic Water Supply | |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | |
| Warm Water Aquatic Life | Fully Supporting | N | | | Warm Water Aquatic Life | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14080201-007_00 | Cottonwood Wash-3 | | RIVER | 17.164 MILES | Cottonwood Wash and tributaries within USFS boundary | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |
| Agricultural | Fully Supporting | N | | | Agricultural | |
| Domestic Water Supply | Not Supporting | N | Radium | 2000 | Domestic Water Supply | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | |
| Warm Water Aquatic Life | Fully Supporting | N | | | Warm Water Aquatic Life | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14080201-008_00 | Westwater Creek | | RIVER | 6.095 MILES | Westwater Creek and tributaries from confluence with Cottonwood Wash to headwaters | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |
| Agricultural | Fully Supporting | N | | | Agricultural | |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | |
| Warm Water Aquatic Life | Fully Supporting | N | | | Warm Water Aquatic Life | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14080201-009_00 | San Juan River-2 | | RIVER | 31.132 MILES | San Juan River from the confluence with Chinle Creek to the confluence with Montezuma Creek | |
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |
| Agricultural | Fully Supporting | N | | | Agricultural | |
| Domestic Water Supply | Fully Supporting | N | | | Domestic Water Supply | |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | |
| Warm Water Aquatic Life | Fully Supporting | N | | | Warm Water Aquatic Life | |
| **AU ID** | **AU Name** | | **Water Type** | **Size** | **Location Description** | |
| UT14080201-010_00 | San Juan River-3 | | RIVER | 33.739 MILES | San Juan River from the confluence with Montezuma Creek to the Utah-Colorado border | |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | | | |
|---|---|---|---|---|---|---|
| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |
| Agricultural | Not Assessed | N | | | Agricultural | |
| Domestic Water Supply | Not Assessed | N | | | Domestic Water Supply | |
| Secondary Recreation | Not Assessed | N | | | Secondary Recreation | |
| Warm Water Aquatic Life | Not Assessed | N | | | Warm Water Aquatic Life | |

| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
|---|---|---|---|---|
| UT14080201-011_00 | Comb Wash | STREAM | 31.6 MILES | Comb Wash and tributaries from the confluence with San Juan River to headwaters |

| **Use** | **Attainment** | **Threatened** | **Cause** | **Cycle First Listed** | **Use** | |
|---|---|---|---|---|---|---|

| **AU ID** | **AU Name** | **Water Type** | **Size** | **Location Description** |
|---|---|---|---|---|
| UT14080201-011_00 | Comb Wash | STREAM | 31.6 | Comb Wash and tributaries from the confluence with San |

| Assessment Results for Streams Colorado River Southeast Watershed | | | | |
|---|---|---|---|---|
| | | | | Juan River to headwaters |
| **Cause** | **Cycle First Listed** | **TMDL Status** | **Use** | **Source** |
| Benthic-Macroinvertebrate Bioassessments | 2010 | Low Priority | Warm Water Aquatic Life | • Source Unknown |

**Table 12-4 Assessment Results for Colorado River Southeast Watershed Management Unit Lake Assessment Units**

| Summary of Individual Lake and Reservoir Support for Colorado River Southeast Watershed Management Unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14030004-001 | Dark Canyon Lake | 2 | 2 | | | | | | ND | | ND | FS | FS | FS | FS | |
| UT-L-14030005-004 | Kens Lake | 2 | 2 | | FS | FS | FS | | No | | Y | NS | NS | FS | FS | FS |
| UT-L-14080203-009 | Lloyds Reservoir | 2 | 2 | FS | FS | FS | FS | | No | | Y | FS | NS | NS | FS | FS |

| Summary of Individual Lake and Reservoir Support for Colorado River Southeast Watershed Management Unit | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-14080203-002 | Monticello Lake | 5 | 5 | pH | | | | | | | N | FS | FS | NS | NS | |
| UT-L-14080201-007 | Recapture Reservoir | 5 | 5, 3B | T, DO | NS | NS | FS | | No | | N | NS | NS | NS | NS | NS |
| UT-L-14030004-001 | Dark Canyon Lake | 2 | 2 | | | | | | ND | | ND | FS | FS | FS | FS | |

## Summary of Individual Lake and Reservoir Support for Colorado River Southeast Watershed Management Unit

| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | Parameters Not Supporting 2010 | | | | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | Assessment Cycle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DO | pH | T | Other | | | | 2002 | 2004 | 2006 | 2008 | 2010 |

**Notes:**

FS Fully Supporting

NS Not Supporting

Y Yes

N No

DO Dissolved Oxygen

FK Fish Kill

T Temperature

Total P Total Phosphorus

NA Not Analyzed

TDS Total Dissolved Solids

**Table 12-5 Individual Lake and Reservoir 2010 Trophic State Index (TSI)**

| Individual Lake and Reservoir 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Colorado River Southeast | UT-L-14030005-004 | Kens Lake | 7/11/2007 | 45 | 42 | 37 |
| Colorado River Southeast | UT-L-14080203-009 | Lloyds Reservoir | 7/11/2007 | 59 | 39 | 37 |
| Colorado River Southeast | UT-L-14080201-007 | Recapture Reservoir | 6/28/2007 | 46 | 33 | 37 |
| Colorado River Southeast | UT-L-14080201-007 | Recapture Reservoir | 7/10/2007 | 52 | | |
| Colorado River Southeast | UT-L-14080201-007 | Recapture Reservoir | 7/11/2007 | | 33 | 37 |
| Colorado River Southeast | UT-L-14080201-007 | Recapture Reservoir | 8/9/2007 | 56 | 27 | 37 |
| Colorado River Southeast | UT-L-14080201-007 | Recapture Reservoir | 8/29/2007 | 54 | 30 | 37 |

| Individual Lake and Reservoir 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| Colorado River Southeast | UT-L-14080201-007 | Recapture Reservoir | 9/19/2007 | 60 | 37 | 37 |

Notes:

TSI-SD = Trophic State Index from secchi disk

TSI-Chla = Trophic State Index from chlorophyll-a

TSI-TP = Trophic State Index from total phosphorus

**Table 12-6 Summary of Individual Lake and Reservoir Trophic State Index (TSI)**

| Summary of Individual Lake and Reservoir Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| Colorado River Southeast | UT-L-14030005-004 | Kens Lake | 57 | 44 | 45 | 36 | 39 | 43 | 41 | 40 | 41 | 42 | M | M |
| Colorado River Southeast | UT-L-14080203-009 | Lloyds Reservoir | 49 | 43 | 47 | 36 | 38 | 36 | 33 | 52 | 45 | 39 | M | E |
| Colorado River Southeast | UT-L-14080201-007 | Recapture Creek Reservoir | 46 | 49 | 45 | 36 | 41 | 40 | 34 | 46 | 41 | 32 | M | O |

| Summary of Individual Lake and Reservoir Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |

Notes:

2010 Old Method TSI calculated using the 2008 Integrated Report Methodology

2010 Current Method TSI calculated using the 2010 Integrated Report Methodology of only chlorophyll-a

O = Oligotrophic

M = Mesotrophic

E = Eutrophic

H = Hypereutrophic

# Figures

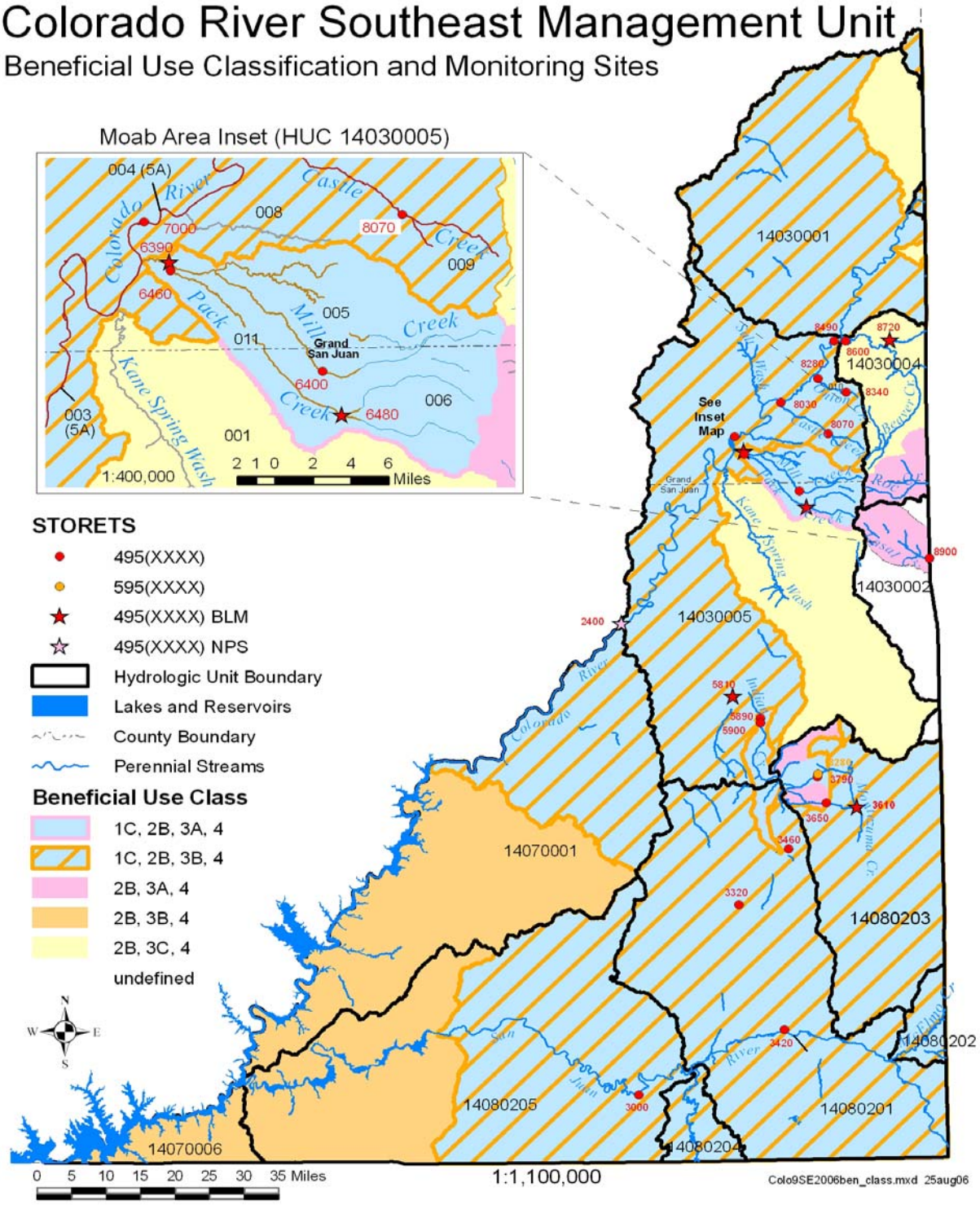


**Figure 12-1 Beneficial Use Classes for Colorado River Southeast Watershed Management Unit**

# CHAPTER 13: GREAT SALT LAKE AND WEST DESERT WATERSHED MANAGEMENT UNIT ASSESSMENT

## 13.1 INTRODUCTION

The Great Salt Lake and West Desert Watershed Management Unit (WMU) includes all streams located in the USGS Hydrological Units (HUCs) listed in Table 13-1. This management unit stretches from the north western portion of the state south to almost Cedar/Beaver Management Unit. There are many small streams within this WMU, which include: Deep Creek, Trout Creek, Grouse Creek, Pine Creek, Pole Creek, and South Junction Creek. These streams flow from the various mountain ranges into the West Desert and disappear. Some of them are diverted at the canyon mouths to be used for irrigation. Those streams in the Hydrologic Unit 17040210 flow north into the Snake River. Figure 13-1 shows the beneficial use classes for this WMU.

## 13.2 STREAM ASSESSMENT RESULTS

The west desert portion of this unit is remote, with rugged mountain ranges, and desert. As a result, assessments for these watersheds are limited to biological assessments until water quality problems are observed. To date, biological data has been collected for three streams in this unit: Trout Creek, Thomas Creek and Pole Creek. The biological data for Trout and Thomas Creeks is fully supporting. The biological data for Pole Creek was inconclusive, so the stream was listed as Category 3A (insufficient data and information). The remaining streams in this unit are not assessed. Beneficial use classifications for waters in this management unit are shown in Figure 13-1.

## 13.3 LAKE ASSESSMENT RESULTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends.

Table 13-3 shows TSIs based on each sample collected from May through September by sample date. Table 13-4 contains a summary of lake trophic status by study periods. Note that some of the change in TSIs between assessment periods is due to the variability in the lakes and some is due to switching methodologies between 2008 and 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). Table 13-4 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. Small differences were observed for Grantsville Reservoir. These small differences suggest little difference in trophic state between the new and older methods for Grantsville Reservoir.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. Consistent trends that resulted in a net TSI change of five or changes greater than 10 between 2008 and 2010, which are not attributable to the change in TSI methodology alone, are identified. No trends were observed.

Development of assessment methods for Great Salt Lake is currently incomplete. More information on progress with developing assessment methods for the Great Salt Lake ecosystem can be found in Chapter 14.

# TABLES

**Table 13-1 USGS Hydrological Units in the West Desert Watershed Management Unit**

| USGS Hydrological Units in the West Desert Watershed Management Unit | |
|---|---|
| **Hydrological Unit Code** | **Hydrological Unit Name** |
| 17040210 | Raft |
| 17040211 | Goose |
| 16020301 | Hamlin-Snake Valleys |
| 16020302 | Pine Valley |
| 16020303 | Tule Valley |
| 16020304 | Rush-Tooele Valleys |
| 16020305 | Skull Valley |
| 16020306 | Southern Great Salt Lake Desert |
| 16020307 | Pilot - Thousand Springs |
| 16020308 | Northern Great Salt Lake Desert |
| 16020309 | Curlew Valley |
| 16020310 | Great Salt Lake |

**Table 13-2 Summary of Assessment Results for Great Salt Lake and West Desert Watershed Management Unit Lakes**

| Summary of Assessment Results for Great Salt Lake and West Desert Watershed Management Unit Lakes | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |
| UT-L-16020304-005 | Grantsville Reservoir | 2 | 2 | | FS | FS | FS | | No | | Y | FS | FS | FS | FS | FS |
| UT-L-16020304-002 | Rush Lake | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |
| UT-L-16020304-004 | Settlement Canyon Res | 2 | 2 | FS | | | | | | | N | FS | FS | FS | FS | |
| UT-L-16020304-003 | Stansbury Lake | 3B | 3B | DO | | | | | | | N | FS | FS | FS | | |

| Summary of Assessment Results for Great Salt Lake and West Desert Watershed Management Unit Lakes | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parameters Not Supporting 2010 | | | | | | | Assessment Cycle | | | | |
| Assessment Unit ID | Name | Assessment Category 2008 | Assessment Category 2010 | Parameters Not Supporting 2008 | DO | pH | T | Other | Total P > 0.025 mg/L or TSI>50 | Winter DO/Fish Kills | Cyano Bacteria Present | 2002 | 2004 | 2006 | 2008 | 2010 |

**Notes:**

FS Fully Supporting

NS Not Supporting

Y Yes

N No

DO Dissolved Oxygen

FK Fish Kill

T Temperature

Total P Total Phosphorus

NA Not Analyzed

TDS Total Dissolved Solids

**Table 13-3 Individual Lake and Reservoir 2010 Trophic State Index (TSI)**

| Individual Lake and Reservoir 2010 Trophic State Index (TSI) | | | | | | |
|---|---|---|---|---|---|---|
| **Watershed Management Unit** | **Assessment Unit** | **Name** | **Date** | **TSI-SD** | **TSI-Chla** | **TSI-TP** |
| GSL and West Desert | UT-L-16020304-005 | Grantsville Reservoir | 9/4/2007 | 62 | 41 | 37 |

Notes:

TSI-SD = Trophic State Index from secchi disk

TSI-Chla = Trophic State Index from chlorophyll-a

TSI-TP = Trophic State Index from total phosphorus

**Table 13-4 Summary of Individual Lake and Reservoir Trophic State Index (TSI)**

| Summary of Individual Lake and Reservoir Trophic State Index (TSI) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed Management Unit | Assessment Unit | Lake / Reservoir | Assessment Cycle Trophic State Index | | | | | | | | | | Trophic State | |
| | | | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2004 | 2008 | 2010 Old Method | 2010 Current Method | 2010 Old Method | 2010 Current Method |
| GSL Desert / Columbia | UT-L-16020304-005 | Grantsville Reservoir | 44 | 49 | 46 | 41 | 50 | 45 | 41 | 43 | 47 | 41 | M | M |

Notes:

2010 Old Method TSI calculated using the 2008 Integrated Report Methodology

2010 Current Method TSI calculated using the 2010 Integrated Report Methodology of only chlorophyll-a

O = Oligotrophic

M = Mesotrophic

E = Eutrophic

H = Hypereutrophic

# Figures

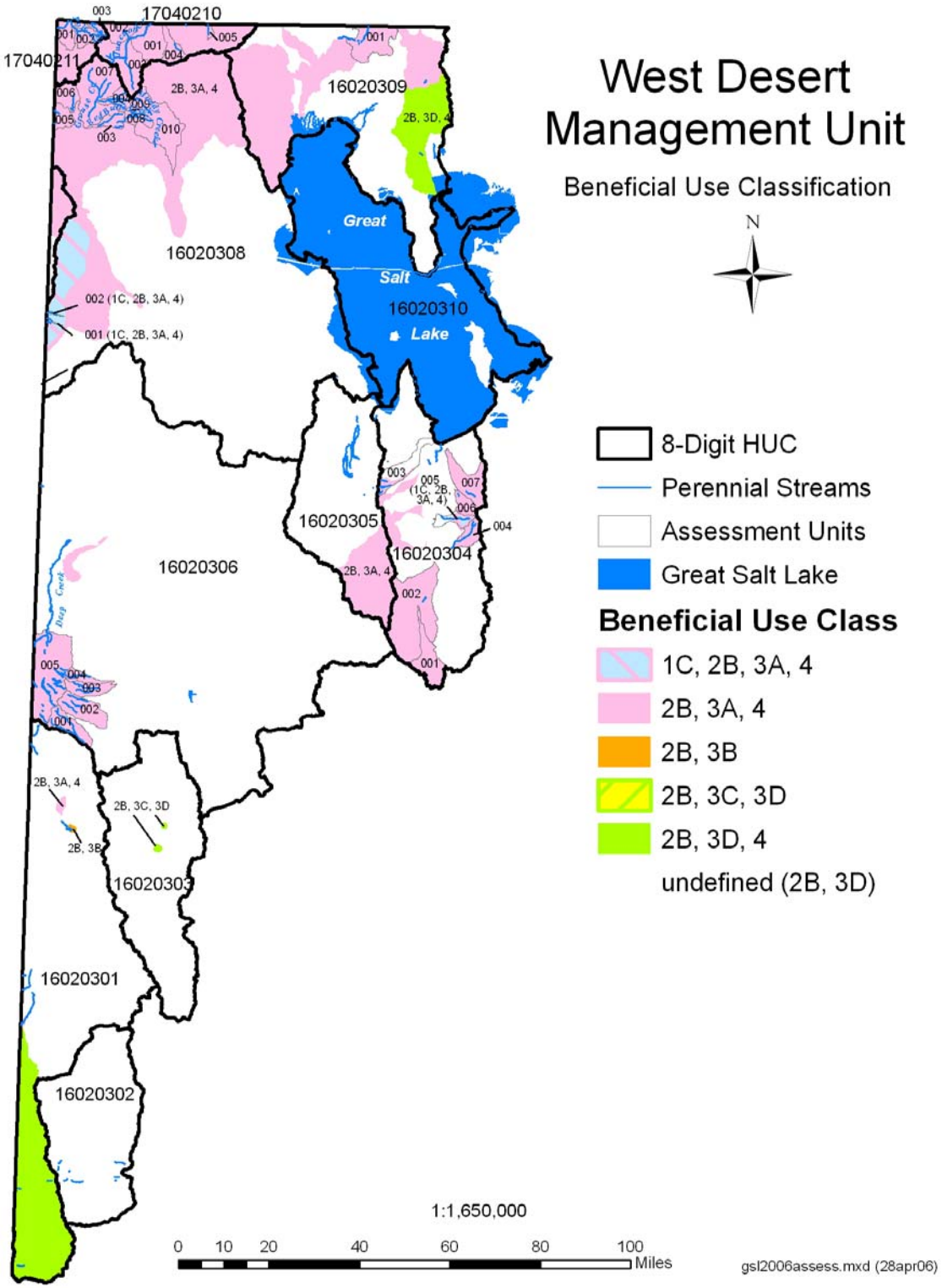


**Figure 13-1 Beneficial Use Classes for Great Salt Lake/West Desert Watershed Management Unit**

# CHAPTER 14: GREAT SALT LAKE

## 14.1 OVERVIEW

The Great Salt Lake (GSL) is a unique and ecologically important ecosystem, yet numeric water quality criteria have generally not been developed for the lake yet. The lake's unique biogeochemistry and hydrology, has made it difficult to establish numeric criteria because scientific investigations of appropriate freshwater or marine standards are not applicable. Further, it has been difficult to establish expected or natural conditions without comparable reference sites. Despite these difficulties, the Utah Division of Water Quality (UDWQ) is committed to establishing numeric criteria and associated assessment methods for this ecologically and economically unique ecosystem.

Over the past several years DWQ has made significant headway towards understanding water quality on the GSL and assessing whether the GSL can support its beneficial uses as required by Clean Water Act (CWA) rules and regulations. As of 2008, a selenium standard for the lake was established and represents the lake's first numeric water quality criterion. Other numeric criteria will follow, but until they are developed UDWQ must develop procedures to interpret and apply the narrative standard to ensure that water quality is protected. In particular, protections are needed to assess beneficial use support, develop permit limits, implement antidegradation, and other CWA protections established through State and Federal regulations.

The overall strategy is to create assessment frameworks based on biological, physical and chemical parameters and use the frameworks to document if and how the beneficial uses are protected using the narrative criteria.

In the GSL Appendix of the 2008 Integrated Report, http://www.waterquality.utah.gov/WQAssess/Draft_2008IR_GSL_Appendix2.2.pdf, an assessment framework for Mercury and Nutrients were proposed that would use biological, physical and chemical indicators to assess the support of the lake's designated uses. This framework uses multiple lines of evidence, interpreted through a risk analysis, to ultimately assess support of aquatic life through the narrative standard. For each major bay (Gilbert, Gunnison, Bear River, and Farmington) of the GSL and the transitional wetlands, different lines of evidence were developed and weighted based on the distinct salinity and hydrologic regimes of these areas and their unique biological communities. Through this process, DWQ realized that each of these areas needed to be considered independently to further develop CWA programs. As a result, DWQ reclassified the designated beneficial uses of Great Salt Lake (Class 5) into five subclasses (5A-5E) in state code UAC R317-2-6. This reclassification is described in this document along with a characterization of each of these classes.

For this reporting cycle, a scoping level beneficial use assessment of Mercury in GSL was conducted and a process was developed that will allow UDWQ to use an Ecological Risk Assessment to interpret all mercury data in the context of beneficial use support. At present, additional data and information are necessary to perform the ecological risk assessment. DWQ anticipates that a beneficial use support determination will be made in the 2012 Integrated Report Cycle. Until then, the decision is to place the GSL in Category 3B, which includes waters where data and information are insufficient to determine an assessment status.

A preliminary Multimetric Index (MMI) for GSL Impounded Wetlands was also developed that uses multiple lines of evidence to quantify the physical, chemical, and biological condition of these waters (http://www.deq.utah.gov/Issues/gslwetlands/docs/FinalReport122209.pdf). Similar tools are being developed for

other wetland classes with funds recently provided to DWQ through an EPA competitive grant. Ongoing data collection and research will focus on improving and validating the preliminary assessment framework for the impounded wetlands. It is anticipated that the MMI for impounded wetlands of Great Salt Lake will be formally adopted and used to make assessments on the 2012 Integrated Report cycle. DWQ will provide an update on progress of other GSL wetland assessments.

The development of all GSL programs is complex and involves the cooperation and close coordination of many stakeholders. Expertise is also required in numerous, sometimes unrelated, disciplines. Data collection activities must also be coordinated among different State and Federal agencies. All of these stakeholders have a vested, sometimes contrary, interest and/or various regulatory responsibilities. Continued coordination among all of these individuals will be critical to the development of a sustainable water quality program for Great Salt Lake.

## 14.2 REGULATORY REQUIREMENTS

The federal Water Pollution Control Act Amendments of 1972—also known as the Clean Water Act (CWA)—established the institutional structure for the U.S. Environmental Protection Agency (EPA) to regulate discharges of pollutants into the waters of the U.S., establish water quality standards, conduct planning studies, and provide funding for specific grant projects. The EPA has provided most states with the authority to administer many of the provisions of the CWA. Accordingly, UDWQ has assigned appropriate beneficial uses for waters of the State (UAC R317-2) and protects those uses through the development and enforcement of water quality standards (40 *Code of Federal Regulations* (CFR)131.11).

Under the CWA, states are required to develop water quality standards for their surface waters, including wetlands. The EPA has established numeric standards (toxicity thresholds) for many toxic pollutants; these standards are refined and used by the states in conjunction with assessments of the beneficial uses for the various types of water bodies. The application of national freshwater or marine quality criteria to Great Salt Lake is inappropriate because the lake has unique biogeochemical processes that alter the fate and transport of pollutants, and the lake supports unique species different from those upon which national criteria are based. As a result, DWQ is relegated to development of nutrient criteria as resources become available. To date, DWQ has established a single numeric water quality criterion for selenium, which is applicable to Class 5A, Gilbert Bay (UAC R317-2-14).

Until numeric criteria can be developed, the beneficial uses of GSL have are protected with the following narrative criterion (UAC R317-2-7.2):

> *It shall be unlawful, and a violation of these regulations, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures.*

## 14.3 GREAT SALT LAKE BENEFICIAL USE CLASSES 5A-5E

The State of Utah reclassified the designated uses of GSL (Class 5) in 2008 into five subclasses (use Classes 5A, 5B, 5C, 5D, and 5E) that more accurately reflect different salinity and hydrologic regimes and the unique ecosystems associated with each of the four major bays (Gilbert, Gunnison, Bear River, and Farmington) and transitional wetlands. Classification of Great Salt Lake in this manner provides the UDWQ with the flexibility to develop scientifically defensible water quality criteria for each of these unique ecosystems. This flexibility is important because water quality criteria associated with aquatic life uses are intended to protect the species that occupy those waters, which differs among each of GSL's major bays (see Section 2.3). As a result, these distinct ecosystems were recently reclassified in UAC R317-2-6 into separate classes, which are described in this section.

**Class 5A: Gilbert Bay**

Geographical Boundary -- All open waters at or below approximately 4,208-foot elevation south of the Union Pacific Causeway, excluding all of the Farmington Bay south of the Antelope Island Causeway and salt evaporation ponds.

Beneficial Uses -- Protected for frequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

**Class 5B: Gunnison Bay**

Geographical Boundary -- All open waters at or below approximately 4,208-foot elevation north of the Union Pacific Causeway and west of the Promontory Mountains, excluding salt evaporation ponds.

Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

**Class 5C: Bear River Bay**

Geographical Boundary -- All open waters at or below approximately 4,208-foot elevation north of the Union Pacific Causeway and east of the Promontory Mountains, excluding salt evaporation ponds.

Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

**Class 5D: Farmington Bay**

Geographical Boundary -- All open waters at or below approximately 4,208-foot elevation east of Antelope Island and south of the []Antelope Island Causeway, excluding salt evaporation ponds.

Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

**Class 5E: Transitional Waters along the Shoreline of the Great Salt Lake**

Geographical Boundary -- All waters below approximately 4,208-foot elevation to the current lake elevation of the open water of the Great Salt Lake receiving their source water from naturally occurring springs and streams, impounded wetlands, or facilities requiring a UPDES permit. The geographical areas of these transitional waters change corresponding to the fluctuation of open water elevation.

Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

Note that the uses are intentionally general and the language used to describe the uses of these sub-classifications do not dramatically differ. However, the classes are still useful because the chemical and biological data collected from the different bays require independent interpretation. While all areas around GSL support birds, the specific uses of various bird species differ among each area of the lake. For instance, the food webs—organisms in the necessary food chain—of bird species often varies from one bay to the next. Also, while all the bays are hydrologically connected with an interdependence that cannot be ignored, their different salinities affect background chemical constituents and therefore, an appropriate interpretation of chemical data must be location-specific. As a result, it is anticipated that specific assessment methods and numeric criteria will be required for each of these classes.

## 14.4 LAKE ELEVATION BOUNDARY OF 4208 FEET

A lake elevation of 4208 feet was chosen as the boundary to distinguish GSL from its surrounding aquatic ecosystems. UDWQ chose 4208 feet as the maximum elevation because below this elevation, fluctuations in lake levels result in changes to soil salinity that subsequently cause important shifts in communities of aquatic dependent plants and animals and alters the aquatic life uses of 5E wetlands. These alterations are part of GSL's natural history and the resulting ecological succession is hypothesized to be among the many reasons for GSL's amazing biodiversity.

Over the years, UDWQ has been asked by stakeholders where the GSL ends and freshwater criteria apply. There are no clear rules that UDWQ could follow to demarcate the GSL from its surrounding environment, so any boundary selected is necessary and somewhat arbitrary. After consideration of various potential boundaries, the elevation of 4208 feet was determined to be an appropriate boundary due to some of the following reasons:

- The State of Utah owns and manages sovereign lands pursuant to the Equal Footing Doctrine. The bed of Great Salt Lake below the boundary of the surveyed meander line is sovereign land. The meander line is located between 4202 and 4212 feet above sea level with a general elevation of 4208 feet (personal communication Dave Grierson, FFSL). The surveyed meander line is the adjudicated, fixed and limiting boundary between sovereign land and upland owners (Great Salt Lake Comprehensive Management Plan 1999). Above the meander line, ownership is largely private consisting of numerous privately owned duck clubs, sanctuaries (the Nature Conservancy and National Audobon's Gilmore), and some mitigation preserves (the Legacy Nature Preserve, Inland Sea Shorebird Reserve and the Salt Lake International Airport Wetland)

- The West Desert Pumping Project was designed to alleviate the effects of flooding in Great Salt Lake by pumping water into the West Desert, lowering the lake level in the shortest period of time. Pumping north arm brines when the elevation in the South Arm is 4208 feet was determined by the State as optimal to meet environmental concerns, avoiding substantial start up and operational costs, and minimizing conflict with the US Air Force.
- According to USGS records recorded at Saltaire from 1881 to 2006, the mean annual average of the GSL is 4199.8 feet and 99% of the time, the mean annual elevation will be below 4209.79 feet
- The top of the Davis County Causeway is located at an elevation of crest at 4208.75 feet. When lake level is above this elevation, waters of Farmington Bay and Gilbert Bay would be free to mix (Gwynn, 1998).
- According to the GSL Comprehensive Management Plan, from an elevation of 4208 to 4212 (Zone 6) feet, many recreation, wildlife and other facilities close to the lake would experience damage due to flooding and the salinity of the lake would range from 4 to 6% in the South Arm and 15 to 17% in the North Arm. This is a significant change from Zone 4 (elevation of 4204' to 4208') where salinity of the lake would range from 9 to 12% in the South Arm and 20 to 24% in the North Arm.
- Major transportation (interstates and railroads), mineral industries and sewage treatment facilities are protected to at least 4208' (Great Salt Lake Comprehensive Management Plan (1999).

Despite these rationales, the elevation boundary of 4208 feet remains controversial and this boundary may be altered in the future if a more appropriate boundary can be identified.

## 14.5 HYDROLOGIC AND GEOCHEMICAL DIFFERENCES BETWEEN CLASSES 5A-5E

### 14.5.1 Gilbert (Class 5A) and Gunnison Bay (Class 5B)

Prior to completion of the Southern Pacific railroad causeway in 1959, the hydrologic and geochemical characteristics of Great Salt Lake were typical of a terminal lake. The lake was considered to be well mixed from top to bottom with no density stratification (Gwynn, 1988). As lake volume, area and elevation increased, salinity decreased.

After completion, the rock fill causeway spanned from Promontory Point to the west shore of the lake and flow between the North arm and South arm was limited to two 15 foot by 20 foot culverts and the permeability of the rock fill causeway. As a result of the causeway, two ecologically distinct parts of the lake, Gunnison Bay north of the causeway and Gilbert Bay south of the causeway, developed. With limited exchange flow and 90% of the fresh water inflow coming into Gilbert Bay with little inflow to Gunnison Bay, Gunnison bay has become a highly saline system with an average salinity of 27% (as recorded by the USGS gage at Saline). At the same time, Gilbert Bay is much less saline with an average salinity of 14% recorded at the USGS gage at Salt Air. Overall, the salinity of Gilbert Bay fluctuates inversely with lake elevation while Gunnison Bay stays relatively constant, near saturation (Gwynn, 2002).

From September 1982 to June 1986, the level of Great Salt Lake in Gilbert Bay rose from 4199.8 feet to 4211.85 feet exceeding the previous historic high recorded in 1873 (Austin, 2000). This rapid rise caused extensive flood damage. In 1984, the state of Utah created a 290 foot breach in the causeway to lower the lake level in Gilbert Bay as an interim flood control remediation effort. As a more permanent flood control solution, the state legislature funded in 1985 the West Desert Pumping Project designed to pump large volumes of water into an area in the West Desert. From 1987 to 1989, 2.2 million acre feet of water and 695 million tons of salt were pumped out of the lake. Figure 14-1 illustrates the differences in salinity between the pre and post causeway conditions and the dramatic drop in salinity during the flood years. The new breach, the pumping, and the flooding caused an overall

freshening of all GSL bays, but the relative among-bay differences in salinity (i.e., Gunnison Bay remaining more saline then Gilbert Bay) remained.

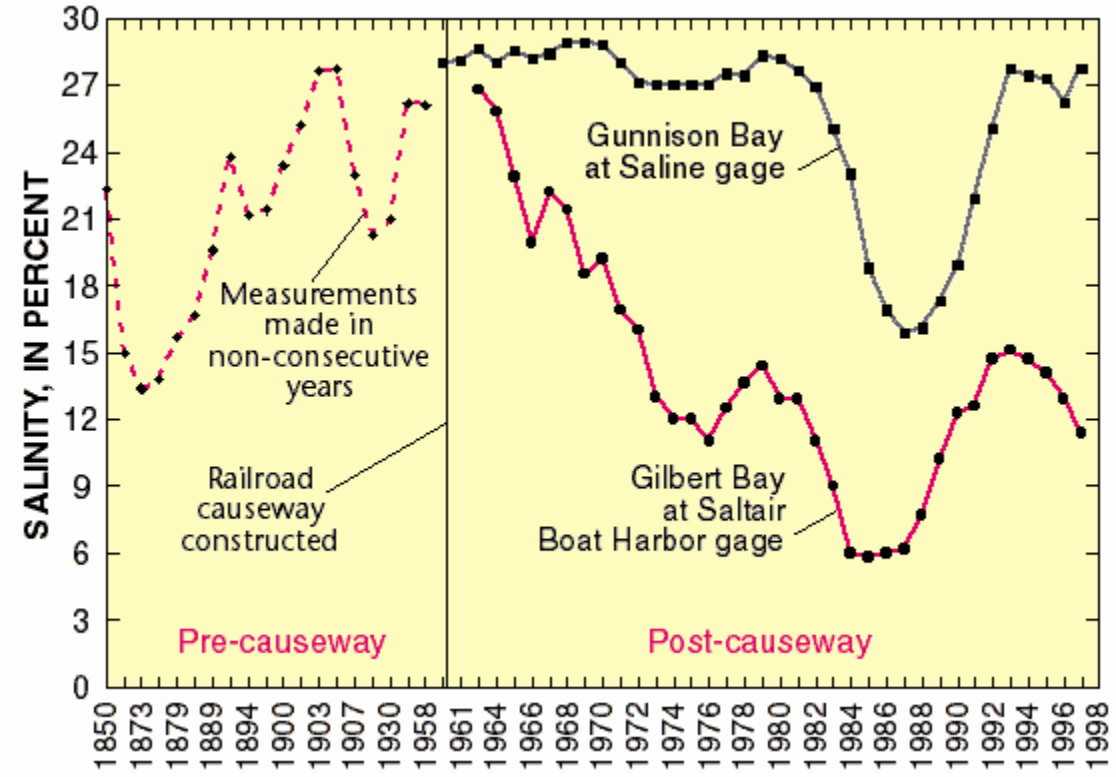


**Figure 14-1 Salinity of Gunnison and Gilbert Bays pre and post causeway as reported by the USGS based on the Saline and Saltair gages**

One of the GSL's unique hydrological characteristics is bidirectional flow through causeway breaches between the bays. This bi-direction flow is characterized by a deep, dense, and turbid brine layer overlaid by a less dense clearer brine layer. The movement of the layers through culvert openings is dependant on the density difference between the layers and the head differential (differences in elevation) between the bays. For instance, deep brine from Gunnsion Bay flows to Gilbert Bay as lighter surficial brine flows from Gilbert Bay to Gunnison Bay simultaneously and in opposite directions. These directions occasionally reverse due to storm events. The deep brine layer is characterized by extremely high salinity and anoxic conditions and thus few organisms survive in this layer. The dense brine layer also affects the fate and transport of pollutants because this layer creates reducing conditions that alter the cycling of phosphorous, nitrogen, and metals. Mixing of the deep brine and shallow brine layers and movement of the layers between culverts can also occur during wind events.

To characterize the hydrology and geochemistry for each Bay (Classes 5A – 5E), post flood conditions (from 1995 onwards) will be used to develop numeric criteria and assessment methods for the GSL.

### 14.5.2 Bear River Bay (Class 5C)

Bear River Bay is separated from Gilbert Bay by the Southern Pacific Railroad causeway that extends from Promontory Point to Little Mountain. One culvert allows for bi-directional flow between Bear River Bay and Gilbert Bay. The upper layer of water near the culvert contains 1 to 2% salt while the deeper brine layer is similar in salinity to the deep brine layer in Gilbert Bay. The thickness of the deep brine layer with the overlying less dense brine extending into the Bay is dependant on the inflow rate into the bay and wind conditions. North of the railroad causeway lies a dike and bridge managed by Great Salt Lake Minerals owned by Compass Minerals. The bridge opening is roughly 50 feet in length. Bear River Bay receives the most fresh water inflow of any of the bays from the Bear River and as a result, is the least saline. At an elevation of 4200', the maximum depth of water is 8' and the average depth of water is 2' (Gwynn, 1986). Before reaching the Great Salt Lake, the Bear River flows through the Bear River Migratory Refuge, owned and managed by the US Fish & Wildlife Service since 1928.

### 14.5.3 Farmington Bay (Class 5D)

Farmington Bay is separated from Gilbert Bay by the Davis County (Antelope Island) Causeway at the northern end and the Island Dike Road at the southern end of Antelope Island. The limited exchange of flow between Farmington Bay and Gilbert Bay is through 2, 10' x 15' culverts and a bridge at 4213.5'. The Bay is shallow with a maximum depth of 7 to 8 feet at a lake elevation of 4200' (Gwynn, 2000). The Bay receives inflows of fresh water from the Jordan River, numerous creeks, groundwater and the Central Davis Sewer district outflow. Bi-directional flow occurs at the culverts and the bridge opening where denser brines from Gilbert Bay flow into Farmington Bay underneath less dense fresher brines from the Bay. The south to north flow of less dense fresher brines through the causeway is due to the head differential between Farmington Bay and Gilbert Bay. The difference in the density of the brines causes the denser brines to flow from Gilbert Bay into Farmington Bay. This bi directional flow prevents the bay from being fresh water. When the lake elevation is above 4208.75' (the crest elevation of the Davis County Causeway), Farmington Bay and Gilbert Bay mix and the salinity becomes more equal to Gilbert Bay.

### 14.5.4 Transitional Waters along the Shoreline of the Great Salt Lake (Class 5E)

The Transitional Waters are defined as all waters below approximately 4,208-foot elevation to the current lake elevation of the open water of the Great Salt Lake. These wetlands receive their source water from naturally occurring springs and streams, impounded wetlands, or from wastewater discharges of facilities with UPDES permits. The geographical areas of these transitional waters changes with the fluctuation in open water lake elevation. Considerable land area is exposed or submerged with small changes in lake elevation. On average for every foot of change in elevation whether rising or lowering, it is estimated that 44,000 acres lake wide and 17,500 acres along the eastern shore are inundated or exposed (Cruff, 1986). The boundaries of wetland plant communities are limited by the salinity of the water and sediments. Species composition is dependant on the tolerance to salinity, time of inundation and the depth of water (Aldrich and Paul, 2002). Micro habitats may be formed in the transitional wetlands and include estuaries, shoreline playas, ephemeral pools and emergent marshes and within them freshwater invertebrates, fish, and birds become present. In turn, these microhabitats are important to birds because they provide foraging areas, staging areas during migration, and areas for breeding and brooding offspring.

## 14.6 GSL BENEFICIAL USES: WATERFOWL, SHORE BIRDS AND OTHER WATER-ORIENTED WILDLIFE INCLUDING THEIR NECESSARY FOOD CHAIN

The aquatic organisms found in GSL are those that can survive highly saline waters. These specialized aquatic organisms (e.g. brine shrimp) do so with little predation or competition for food sources and can subsequently thrive in these environments. As salinity decreases, more organisms become present and generally out-compete the salt tolerant organisms resulting in a gradual shift towards communities of fresh water organisms (Collister and Schamel, 2002). These discrete ranges of salinity result in biological communities dominated by different species, which subsequently alters the food web through alterations of the composition and abundance of organisms that occupy different ecological guilds. Annual variation in lake level, water temperature and salinity dictate the abundance of plants and animals, and the timing of many biological processes. Table 14-1 lists the salt water and fresh water organisms that are typically found within the Bays at an elevation between 4198' to the boundary of 4208' post 1987 flood conditions. For the 2012 Integrated Report, the biological communities and their habitats for purposes of water quality assessments will be further defined for classes 5A –5E.

**Table 14-1 Source of inflow, range of salinity and aquatic organisms present in Gunnison, Gilbert, Farmington and Bear River Bays**

| BAY | SOURCE OF INFLOW | ESTIMATED SALINITY (%)<br><br>(RANGE DETERMINED AT 4198' AND 4208' POST 1987) | PERIPHYTON AND PHYTOPLANKTON | BRINE SHRIMP (*ARTEMIA FRANCISCANA)* | BRINE FLIES (*EPHYDRA SPP*) | FRESHWATER SPECIES | AVIAN ENDPOINTS |
|---|---|---|---|---|---|---|---|
| Gunnison | Springs, Creeks, groundwater, Gilbert Bay bi directional flow | 16 to 27%* | Halophylic bacteria, Chlorophyta *(Dunaliella salina)* | Solely at railroad causeway, no known reproduction | In littoral zone | | |
| Gilbert | Jordan River (Goggin Drain, North Point), Kennecott Outfall, Lee Creek, Weber River, Howard Slough, Bear River bi directional flow Farmington Bay | 7% to 15% * | Chlorophyta,( *Dunaliell viridis)* Cyanophyta (*Nodularia spumigena, A.halophytical*), Pyrrhophyta, Diatoms | Main population consisting of cysts, napulii, juveniles and adults | Main population consisting of brine fly larvae, pupae, and adults | | Reproductive success and body condition |

| BAY | SOURCE OF INFLOW | ESTIMATED SALINITY (%)<br><br>(RANGE DETERMINED AT 4198' AND 4208' POST 1987) | PERIPHYTON AND PHYTOPLANKTON | BRINE SHRIMP (*ARTEMIA FRANCISCANA)* | BRINE FLIES (*EPHYDRA SPP*) | FRESHWATER SPECIES | AVIAN ENDPOINTS |
|---|---|---|---|---|---|---|---|
| | bidirectional flow | | | | | | |
| Farmington | Jordan River, Surplus Canal, Salt Lake Sewage Canal, Central Davis Sewer District Outflow, Gilbert Bay bi directional flow, Creeks (Kays, Holmes, Farmington, Crystal, Spring) | 2 to 6%** | *Nitzschia* spp, Chlorophyta,( *Dunaliell viridis)* Cyanophyta (*Nodularia spumigena*), Diatoms | | | Corixids, Chironomids, fish near sources of inflow, emergent and submergent vegetation | Reproductive success and body condition |
| Bear River | Bear River, Gilbert Bay bi | 1 to 6%** | | | | Corixids, chironomids, | Reproductive success and |

| BAY | SOURCE OF INFLOW | ESTIMATED SALINITY (%)<br><br>(RANGE DETERMINED AT 4198' AND 4208' POST 1987) | PERIPHYTON AND PHYTOPLANKTON | BRINE SHRIMP (*ARTEMIA FRANCISCANA)* | BRINE FLIES (*EPHYDRA SPP*) | FRESHWATER SPECIES | AVIAN ENDPOINTS |
|---|---|---|---|---|---|---|---|
| | directional flow | | | | | fish from 4200' upwards, Freshwater invertebrates, emergent and submergent vegetation | body condition |

* Figure 14-10 Great Salt Lake Comprehensive Management Plan

**Estimated

## 14.7 UPDATE OF ASSESSMENT EFFORTS

### 14.7.1 Mercury

Over the past several years UDWQ has devoted considerable resources to assessing the extent to which mercury poses a risk to GSL aquatic birds and organisms in their food chain. Researchers from US Fish & Wildlife Service, the Utah Division of Wildlife Resources, US Geological Survey, Utah State University and UDWQ collected data in the water, sediment, aquatic birds, and their food chain for mercury concentrations from key focus areas funded by an EPA Regional Geographic Initiative (RGI) grant and state funds. The data from this study and others (i.e., USFWS, Vest et al.) were compiled and compared to literary benchmarks assembled by EPA and USFWS. The results of this effort are detailed in Part 1 of the GSL Mercury Assessment (Appendix A-1). While these efforts have greatly improved our understanding of mercury in GSL, enough questions currently remain that UDWQ believes that decisions regarding mercury impairment should be postponed. For instance, selection of the most appropriate benchmarks to use for quantifying biological responses to mercury have not been finalized. In addition, the linkage between avian tissue concentrations and exposure to GSL as opposed to other waters visited by birds remains unknown. These data gaps will be investigated and incorporated into an ecological risk assessment framework to help UDWQ determine if GSL fails to meet its beneficial uses due to mercury pollution. Part 2 of the GSL Mercury Assessment (Appendix A-2) provides an overview of the ecological risk assessment process and the problem formulation for Mercury in Great Salt Lake. This framework more clearly highlights specific data and information needed to perform the ecological risk assessment. Nonetheless, UDWQ anticipates that a beneficial use support determination will be made by the 2012 Integrated Report Cycle. Until then, the decision is to place the GSL in Category 3B which includes waters where data and information are insufficient to determine an assessment status.

### 14.7.2 Selenium

The first numeric water quality standard for selenium for Great Salt Lake was established in state rule (UAC R317-2-14) in November, 2008. This selenium water quality standard of 12.5 mg/kg is a tissue-based standard based on the complete egg/embryo of aquatic-dependent birds that use the waters of Gilbert Bay (Class 5A), Great Salt Lake. Establishing this standard required a 4-year arduous process led by a Selenium Steering Committee comprised of prominent stakeholders who were advised by an international scientific panel of selenium experts. While this standard became state rule in the Utah Administrative Code, it is awaiting approval by the Environmental Protection Agency, Region 8. The delay in approval is due to legal questions regarding the nexus of the Clean Water Act administered by EPA and the Migratory Bird Treaty Act administered by the US Fish & Wildlife Service. Nonetheless, DWQ continues to protect Great Salt Lake for selenium by monitoring egg tissue in aquatic birds, refining the trophic transfer model through ecosystem monitoring, evaluating trigger selenium concentrations that initiate various monitoring, assessment and management actions and identifying management actions to mitigate further increases in selenium concentrations if an upward trend is observed. The results of these efforts will be reported in the 2012 Integrated Report.

### 14.7.3 Great Salt Lake Wetlands

In December, 2009, UDWQ developed a preliminary Multimetric Index (MMI) for the Great Salt Lake Impounded Wetlands that includes quantitative indicators of water chemistry, submerged aquatic vegetation, surface mats, and benthic macroinvertebrates. These indicators provide multiple lines of evidence that together quantify the relative condition of GSL's impounded wetlands (please access the report and all materials at the UDWQ wetlands website at http://www.deq.utah.gov/Issues/gslwetlands/index.htm). Ultimately, this MMI will allow UDWQ to assess support of aquatic life beneficial uses for these waters. Impounded wetlands are defined as wetlands where the hydrology has been artificially modified through the use of berms, weirs, and culverts to create open water features. Per the updated National Wetland Inventory (US Fish and Wildlife Service, 2008), there are approximately 100,000 acres of such impounded wetlands in and along Great Salt Lake. Ongoing data collection and research will focus on improving and validating the preliminary assessment framework. It is anticipated that the MMI for impounded wetlands of Great Salt Lake will not be formally adopted until 2012.

The MMI for impounded wetlands represents the first step towards UDWQ's management program for assessing all of Great Salt Lake Wetlands. Program tasks to be completed in an iterative manner include: 1) Develop Monitoring and Assessment Methods for Wetland Ecosystems starting with impounded wetlands; 2) Adopt an Assessment (Decision) Framework; 3) Revise Existing Water Quality Standards; 4) Implement a Water Quality Management Strategy for Great Salt Lake Wetlands and; 5) Outline a Comprehensive Great Salt Lake Wetland Water Quality Management Strategy.

The development of this MMI was significantly aided by the input of the Great Salt Lake Wetland stakeholders and scientists. UDWQ will continue to engage stakeholders through the ongoing Great Salt Lake Wetlands Workgroup with the intent to strengthen future assessment frameworks by incorporating input from scientists and other stakeholders, with different areas of expertise.

### 14.7.4 Nutrients

Collaboration between EPA and DWQ resulted in a nutrient assessment framework for Farmington Bay that was part of the Great Salt Lake appendix in the 2008 Integrated Report. Paleolimnological research is underway to evaluate changes in key water quality parameters and biological assemblages over the last 200 years. The results of this study (draft report due April, 2011) will provide preliminary conclusions of nutrient impacts to Farmington Bay.

### 14.7.5 Coordination of Great Salt Lake Monitoring Efforts

Numerous state and federal agencies as well as academic researchers have and are currently collecting data from the GSL. To maximize the exchange of knowledge, data and resources, UDWQ intends on holding a GSL monitoring workshop in 2010. The goal of the workshop will be to identify potential opportunities to collaborate with sampling programs under way by other entities.

### 14.7.6 Scoping Requirements for the Development of a Hydrodynamic Model for GSL

DWQ has contracted for the development of a GSL water quality model to assist in future implementation of GSL water quality standards. Objectives include the development of a strategy that identifies objectives, requirements, and options for assessing how changes in pollutant loads to the lake will affect lake concentrations. Initial criteria that include water quality concerns, key water chemistry issues and hydrodynamic processes in GSL will be used to evaluate model options. The criteria will be refined to identify and evaluate alternative water quality models, and provide a recommended path forward.

## 14.8 CONCLUSION AND NEXT STEPS

UDWQ is striving to develop water quality assessments and endpoints for GSL that measure beneficial use support to determine water quality goals and to evaluate management actions. Our efforts for the next reporting cycle are detailed in the individual reports on Mercury (see Great Salt Lake Assessment for Mercury Parts 1 and 2 of this report), Selenium (http://www.deq.utah.gov/Issues/GSL_WQSC/docs/GLS_Selenium_Standards/index.htm) and the Great Salt Lake Wetlands (http://www.deq.utah.gov/Issues/gslwetlands/docs/FinalReport122209.pdf). UDWQ is in the process of creating a Great Salt Lake website at greatsaltlake@utah.gov (scheduled to go live September, 2010) that will provide all materials pertaining to UDWQ Great Salt Lake issues. The results of additional research on selenium and nutrients as well as the effort to increase coordination with partnering agencies to monitor and manage the lake will be posted on the website. Stakeholder participation and resources are integral to us achieving these goals.

Aldrich, T.W. and D.S. Paul. 2002. “Avian Ecology of Great Salt Lake.” In *Great Salt Lake: An Overview of Change*, ed. J.W. Gwynn. Utah Department of Natural Resources. Special Publication. pp. 343–374.

Collister, J.W., Schamel, S. 2002. “Lipid Composition of Recent Sediments from the Great Salt Lake.” In *Great Salt Lake: An Overview of Change*, ed. J.W. Gwynn. Utah Department of Natural Resources. Special Publication. pp. 127–142.

Cruff, R.W., 1986, Updated table of hypsographic data for Great Salt Lake: U.S. Geological Survey Memorandum, 8 p.

Grierson, Dave. 2008. Strategic Planner, Utah Division of Forestry, Fire and State Lands. Personal Communication.

Gwynn, J.W. 1980. “Great Salt Lake, A Scientific, Historical and Economic Overview.” Bulletin 116, Utah Department of Natural Resources, Utah Geological and Mineral Survey. June.

Gwynn, J. Wallace. 1986. “An approximation of the physical and chemical characteristics of Farmington Bay and Bear River Bay, Great Salt Lake, Utah”: Utah Geological and Mineral Survey Open-File Report 211, 22 p.

Gwynn, J. Wallace. 1997. “Brine Properties, Mineral Extraction Industries, and Salt Load of Great Salt Lake, Utah.” *Public Information Series 51*. Utah Geological Survey, Utah Department of Natural Resources.

Gwynn, J. Wallace. 1998. “Great Salt Lake, Utah: Chemical and physical variations of the brine and effects of the SPRR Causeway, 1966-1996” Utah Geological Association Guidebook 26, p. 71-90.

Gwynn, J. Wallace. 2000. “The Waters Surrounding Antelope Island Great Salt Lake Utah.” Utah Geological Survey Publication 001-1, 11p.

Gwynn, J.W. 2002. “Great Salt Lake, An Overview of Change.” Special Publication of Utah Department of Natural Resources (UDNR), Utah Geological Survey.

U.S. Environmental Protection Agency (EPA). 2005. 40 *Code of Federal Regulations* §131.11 Criteria. Revised July 1, 2005.

U.S. Fish and Wildlife Service (USFWS). 2009. *Assessment of Contaminants in the Wetlands and Open Waters of the Great Salt Lake, Utah 1996-2000*. U.S. Department of Interior, Fish and Wildlife Service. May. 98p.

Vest, J.L., M.R. Conover, C. Perschon, J. Luft, and J.O. Hall. 2009. Trace Element Concentrations in Wintering Waterfowl from Great Salt Lake. Arch. Environ. Contam. Toxicol. 56:302-316

# APPENDIX A-1

# DRAFT GREAT SALT LAKE ASSESSMENT FOR MERCURY

# PART 1 - 2010 STATUS OF SCOPING-LEVEL ASSESSMENT

## TABLE OF CONTENTS

## LIST OF TABLES



## LIST OF FIGURES

## 1. INTRODUCTION

In Utah's 2006 Integrated Report, Great Salt Lake (GSL) was not included in any assessment category. Because of the unique characteristics of GSL and the lack of assigned numeric criteria, the State's Assessment Methodology did not provide for a process to use in determining if GSL supports its assigned beneficial uses under the Clean Water Act. Public comment on the 2006 Integrated Report (IR) raised concerns about the condition of the GSL and cited evidence of potential nutrient enrichment in Farmington Bay, elevated water-column mercury concentrations, and findings of mercury accumulation in the avian species frequenting GSL. In addition, studies conducted by DWQ and our collaborators further highlighted potential problems with mercury and potential degradation of some of GSL's wetlands.

In response to these increasing concerns over water quality in the GSL, the Utah Division of Water Quality (UDWQ) and the Environmental Protection Agency (EPA) formed a collaborative workgroup to develop a framework that will ultimately allow DWQ to assess the ability of GSL to support its beneficial uses as designated under the Clean Water Act and associated Utah Administrative Rules.

The result of this collaborative effort was a draft assessment framework that identifies potential indicators of water quality for both eutrophication and mercury, and then ranks the relative strength of each indicator. This approach for assessing the GSL and its surrounding wetlands is described in Appendix A of the 2008 IR. Over the past two years the framework described in this appendix has served as a guide in the development and implementation of scientific investigations to fill key data gaps identified through the assessment methodology for the GSL. The status of these monitoring and research efforts is described in this document. The reader is directed to Utah's 2008 IR Appendix A that discusses general project planning and the initiation of these efforts.

While efforts have been made to fill data gaps for both eutrophication and mercury, DWQ has primarily focused our efforts on establishing an assessment framework for the open water of GSL for mercury, because mercury is a toxic pollutant with potentially deleterious effects to both human health and GSL biota. This document describes the preliminary findings of a scoping-level assessment of mercury in GSL in Part 1 and the approach to an ecological risk assessment in Part 2. This work is designed to determine whether mercury conditions in the GSL have impaired aquatic life uses and to identify potential remediation efforts to ensure protection of this important waterbody.

The assessment methodology outlined in this document represents the scoping level portion of the assessment process developed in 2008 (step 4 as identified in figure SS-1 – see the 2008IR). The purpose of Part 1 of this scoping level effort is to gather preliminary data and develop thresholds with which to interpret these data. This process is expected to be iterative and conclusions may change as additional data become available. The purpose of Part 2 is to develop a process to make environmental decisions using an Ecological Risk Assessment for Mercury in GSL.

Based on the available data for GSL, enough questions remain regarding the most appropriate benchmarks to use for data evaluation and the linkage between avian tissue concentrations and exposure to GSL warranting further targeted study and an ecological risk assessment prior to determining if GSL is meeting its beneficial uses. Peer review of the assessment presented in this document is required as well as expert review of the proposed benchmarks. It is expected that a final listing decision will be made by the 2012 Integrated Reporting cycle.

## 2. APPLICABLE BENEFICIAL USES AND NARRATIVE WATER QUALITY CRITERIA FOR GSL

The State of Utah's Rule R317-2 for Standards of Quality for Waters of the State lists GSL as a category 5 waterbody. The State of Utah reclassified the designated uses of Great Salt Lake (Class 5) in 2008 into five subclasses (5A-5E) that more accurately reflect different salinity and hydrologic regimes and the unique ecosystems associated with each of the four major bays (Gilbert, Gunnison, Bear River, and Farmington) and transitional wetlands (UAC R317-2-6). All five of these Great Salt Lake subclasses are protected for infrequent primary and secondary contact recreation, waterfowl, shore birds, and other water-oriented wildlife, including their necessary food chain. These are the GSL's beneficial uses that must be protected under the Clean Water Act.

Because of the unique and variable limnological conditions of GSL and lack of reference sites with which to compare this waterbody, expected conditions for this waterbody are difficult to define. This has slowed the establishment of numeric criteria. At present, numeric water quality criteria have not been established for the GSL for mercury, rather the State's narrative criterion applies and states:

> *"it shall be unlawful, and a violation of these regulations, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures."*

## 3. BACKGROUND ON BENEFICIAL USE SUPPORT IMPAIRMENT DETERMINATIONS USING INDICATORS

Since GSL does not have a numeric criterion for water column mercury concentrations, assessing whether GSL supports its beneficial uses requires a methodology for interpreting Utah's narrative water quality standards. The mercury assessment framework that was developed uses multiple lines of evidence to evaluate the effects of mercury on GSL biota. The advantage of this approach is that definitive proof of mercury impairment is not needed for each indicator. Instead, the approach allows all indicators to be weighted and subsequently interpreted through a risk analysis process to evaluate whether aquatic life uses of the GSL are at risk.

### 3.1 INDICATORS OF BENEFICIAL USE SUPPORT

The assessment framework proposes both *direct* and *indirect* indicators of GSL ecosystem health. Thereby, multiple lines of evidence and measures were to be used to determine whether the beneficial uses are at risk.

**Direct Indicators of Beneficial Use Support**

The most direct evidence for determining whether a waterbody is supporting its beneficial uses associated with shorebirds and waterfowl is to measure the success of these populations directly. Examples of direct indicators include:

- *Waterfowl/ Shorebird Use Support*: Quantifiable measures of the shorebird or waterfowl population counts and documented deaths or reproductive impairment occurring in the waterbody and attributable to the GSL.

Direct indicators are often difficult to develop due to the amount of data required, the influence of multiple stressors, and the need for "reference" sites for the development of thresholds or benchmarks. Because GSL is such a unique ecosystem, biological indices for macroinvertebrates, zooplankton, and algal species are not readily available in the literature or are not applicable to GSL. Hence, it is difficult to directly assess changes in the avian food-chain productivity. Additionally, direct indicators for waterfowl and shorebird use support would involve long-term population and reproduction studies. Though some of this work is underway, results and interpretation of population studies are not available to assess GSL in the short-term.

**Indirect Indicators of Beneficial Use Support**

When it is difficult to gather or interpret data for direct indicators, *indirect indicators* can serve as surrogates to evaluate whether environmental conditions support an associated beneficial use. Examples of indirect indicators include the following types of measurements:

- *Waterfowl/ Shorebird Use Support*: Mercury concentrations in avian dietary items and in the livers, eggs and other tissues of birds have shown a link between mercury exposure and affects on avian reproduction and health. Hence, concentrations of mercury in the food-chain or avian species that are above thresholds or benchmarks for protection of health and reproduction of birds may be used to indicate nonsupport of this beneficial use.

For the beneficial use assessment of mercury in GSL, use of indirect indicators including the concentration of mercury in the food chain and avian tissues were used to estimate risk to the avian species frequenting GSL. The indirect indicators used in this assessment are identified in Table 1. Direct population counts and measures of avian reproductive health are not currently available.

**Table 1 Draft Mercury Assessment Indicators and Availability of Benchmarks and Data for GSL**

| GSL All areas with waterfowl/ shorebird use | | | | | | | |
|---|---|---|---|---|---|---|---|
| Beneficial Use | Direct Indicators of Beneficial Use Support | Indirect Indicators applicable to the direct indicator | Utility of the Indicator (1-3 with 3 being highest) | Confidence in the Indicator (1-3 with 3 being highest) | Exposure Location/Timeframe Represented by Indicator | Benchmarks Identified for Indirect Indicator | Data Available from GSL |
| Support for Waterfowl and Shorebirds including their food-chain | Waterfowl and/or shorebird health | Hg in diet | 3 | 3 | GSL linked exposure | Yes | Yes |
| | | Hg in adult kidney | 1* | 3 | Not determined | Limited | No |
| | | Hg in adult liver | 3 | 3 | Fairly recent exposure | Yes | Yes |
| | | Hg in adult blood | 3 | 3 | Recent exposure – reflects dietary exposure | Yes | No |
| | | Hg in adult feathers | 2 | 3 | Historic exposure record | Yes | Limited |
| | | Hg in adult brain | 1* | 3 | Not determined | Limited | No |
| | | Hg in adult muscle | 1* | 3 | Not determined | Not for Avian Health | Yes |
| | Waterfowl and/or shorebird reproductive success (hatching, fledgling) | Hg in Egg | 3 | 3 | Walsh 1990 suggested that eggs provide good indicator of mercury exposure in vicinity of nesting site in for immediate pre-laying season. (AEHHIM) | Yes | Yes |
| | | Hg in adult diet | 3 | 3 | GSL linked exposure | Yes | Yes |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Hg in down feathers | 3 | 3 | GSL linked exposure | Yes | No |
| | | Hg in adult liver | 3 | 3 | Fairly recent exposure | Yes | Yes |
| | | Hg in adult brain | 1* | 3 | Not determined | No | No |
| | | Hg in chick blood or whole body | 3 | 3 | GSL linked exposure | Yes | No |

High priority indicators are highlighted in yellow.

* These may be reasonable indirect indicators; but, few literature benchmarks were identified for these tissues and/or limited data are available for GSL.

## 4. WEIGHT OF EVIDENCE DECISION MAKING APPROACH AND PROJECT PLAN

Using a weight of evidence approach, one would identify the important direct and indirect indicators needed to assess beneficial use attainment, identify thresholds for those indicators, and use the preponderance of evidence to make a conclusion regarding impairment. Using the weight of evidence approach, it is not necessary to prove beyond any doubt that a particular contaminant is impacting a beneficial use but rather to demonstrate, using multiple lines of evidence that the beneficial use is likely at risk.

In this case, direct evidence of impairment would include changes in avian populations or reproduction which is not available. Hence, the approach taken for this initial assessment of GSL was to determine if GSL is posing a risk to avian species as indicated by mercury concentrations in the GSL food chain and in multiple types of tissues in birds inhabiting the GSL. The assumption is that if high concentrations of mercury (above applicable pub lished threshold levels for mercury effects) are found in the food chain of GSL as well as in avian tissues of birds feeding at GSL, it is likely that GSL is posing a risk to those species. If GSL is posing a risk to bird species, it should be considered impaired under the Clean Water Act based on the State's narrative criteria described previously.

In order to implement the weight of evidence approach, this scoping level assessment focused on two activities: 1) identifying published mercury thresholds or benchmarks to be used in determining risk for both acute and chronic mercury impacts to avian species; and 2) gathering mercury data from the food chain and birds from GSL to be compared to these benchmarks. Data associated with high priority indicators shown in Table 1 were gathered or assembled from published information. Some data gaps exist and will be discussed in more detail.

## 5. IDENTIFICATION AND SELECTION OF MERCURY BENCHMARKS

The workgroup with support from the US Fish and Wildlife Service (FWS) undertook an extensive literature review to identify potential benchmarks for mercury impairment in avian species. Benchmark selection is ongoing as additional published information becomes available. Hence, this compendium of literature values will continue to be refined. In addition, expert opinion is being sought to assist in the final selection of benchmarks for this study. This document provides an opportunity for comment on the completeness of the benchmark identification and choice of benchmarks for this scoping level assessment of risk.

Evers et al. (2004) has undertaken extensive studies with Loons in the Northeast to determine mercury benchmarks and risk ranges for this species. Evers proposes risk ranges (hereafter ERRs) from low to extra high for dietary exposures, egg concentrations, blood concentrations, and feather concentrations. Of these indicators, diet, blood, and egg risk ranges are of interest for this assessment as there are data available for GSL that may be compared to these ranges.

Evers et al. (2004) was selected for this iteration because:

- The loon is an aquatic-dependent species.
- The ranges are the result of an extensive compilation of studies.
- The ranges provide convenient categories.

The applicability of these ranges to GSL is currently undetermined. Several uncertainties must be addressed prior to making any conclusions using Evers et al. (2004). For instance, how are freshwater exposures different than the high salinity waters of GSL?

Tables 2, 3, and 4 provide a summary of the identified benchmarks for the avian receptors for this assessment (including nonpiscivorus birds) as compared to the risk ranges proposed by Evers for Loons (piscivorous birds). The table header provides the ranges proposed by Evers and the body of the table provides other benchmarks identified in the literature. Currently, these risk ranges and benchmarks are undergoing peer review to refine the selection process. It should be noted that the benchmarks that are listed against the risk ranges were not necessarily used by Evers in establishing his ranges. These tables are provided to illustrate the other benchmarks that are available and how they compare to ERRs.

Evers provides risk ranges for mercury concentrations found in the diet, blood, and eggs for loons. Besides these types of data, liver concentrations of mercury were also measured for GSL species; but, risk ranges for liver concentrations were not identified by Evers for this indicator. Hence, the workgroup applied the concept of risk ranges to the available literature benchmarks to establish low, moderate, high, and extra high concentrations for mercury in avian livers. The benchmarks plotted in Table 5 were used to establish the risk ranges shown in the table header. Again, these are draft risk ranges that are being peer reviewed and should not be used to draw conclusions regarding an impairment of GSL.

# 6. COMPARISON OF GSL DATA AGAINST PROPOSED RISK RANGES AND BENCHMARKS

Assuming that the risk ranges proposed by Evers et al. (2004) and the workgroup are reasonable for a first-cut assessment, we have compared the available data for GSL against these ranges to illustrate the estimated risk posed by mercury concentrations for the indicators of choice. Evers risk ranges are based on data reported on a wet weight basis yet all data used in this report were reported as dry weight. To convert from dry weight to wet weight, multiply the dry weight measurement by (1- percent moisture/100). Percent moisture values for each data set are provided in the sections below.

All data in this report are illustrated with Box and Whisker plots to show the distribution of mercury data. The median is the line between the blue and gray portions. The blue portion is the upper quartile and the gray portion is the lower quartile. The upper line extends to the highest data point and the lower line to the sample minimum. The diamonds represent the average of the data set. The number of samples (n) and the geometric mean (geomean) are also provided. The geometric mean is a measure of central tendency and dampens the effects of outliers. Often aquatic life data are summarized by using the geometric mean as noted in the benchmarks tables. Note that the mercury concentrations sometime vary extensively depending upon the source of the data. Further investgations are needed to evaluate whether these differences are real or an artifact of differing field or laboratory methods; nevertheless, the published values from all sources are reported here.

## 6.1 COMPARISON OF GSL AVIAN LIVER DATA AGAINST PROPOSED RISK RANGES AND BENCHMARKS

Table 6 provides a summary of the available avian liver data associated with the GSL and compared to the very preliminary ERRs.

### 6.1.1 Common Goldeneye Liver Data

From the data reported by Vest et al. 2009, the Common Goldeneye liver results have geometric mean values that fall within the high to extra high risk categories (See Table 6). The values noted for some individuals are above benchmark levels (based on published values by Heinz 1974, Barr 1986, and Scheuhammer 1997) for frank health effects in birds. Common Goldeneye are migratory waterfowl that spend the winter at GSL and feed primarily on brine fly larvae (Vest, 2008). Further analyses are needed to evaluate the linkage of the Common Goldeneye body burdens reflected in the liver concentrations to time spent at GSL, the possible protective effects of selenium interactions with mercury in these birds, and the GSL dietary exposure route and nesting areas for this species. However, one can conclude from these results that further investigation is warranted for this species whether or not their mercury exposure is from GSL or other sites encountered during migration.

### 6.1.2 Northern Shoveler Liver Data

Figure 1 and Table 6 provide the RGI grant data gathered for Northern Shovelers from Farmington Bay, Ogden Bay and Bear River Bay collected from October to December, 2008. This data was collected by the USFWS and the Utah Division of Wildlife Resources per the RGI grant. An average percent liver moisture content of 71% was calculated from the percent moisture results from the USGS Wisconsin laboratory. The geometric mean body burdens of methyl mercury in the liver for Northern Shovelers fall within the low risk range (values less then 0.89 parts per million (ppm) wet weight (ww)). These results are significantly lower than the methyl mercury concentrations reported by Vest et al. 2009 (see Table 6). Those data report geometric mean methyl mercury liver concentrations within the moderate to high risk range. It will be important in future analyses to determine whether the apparent differences in mercury concentrations between Northern Shovelers collected by Vest from 2004 to 2006 as opposed to RGI data collected in 2008 are due to analytical procedures, exposure differences, time of collection, or location.

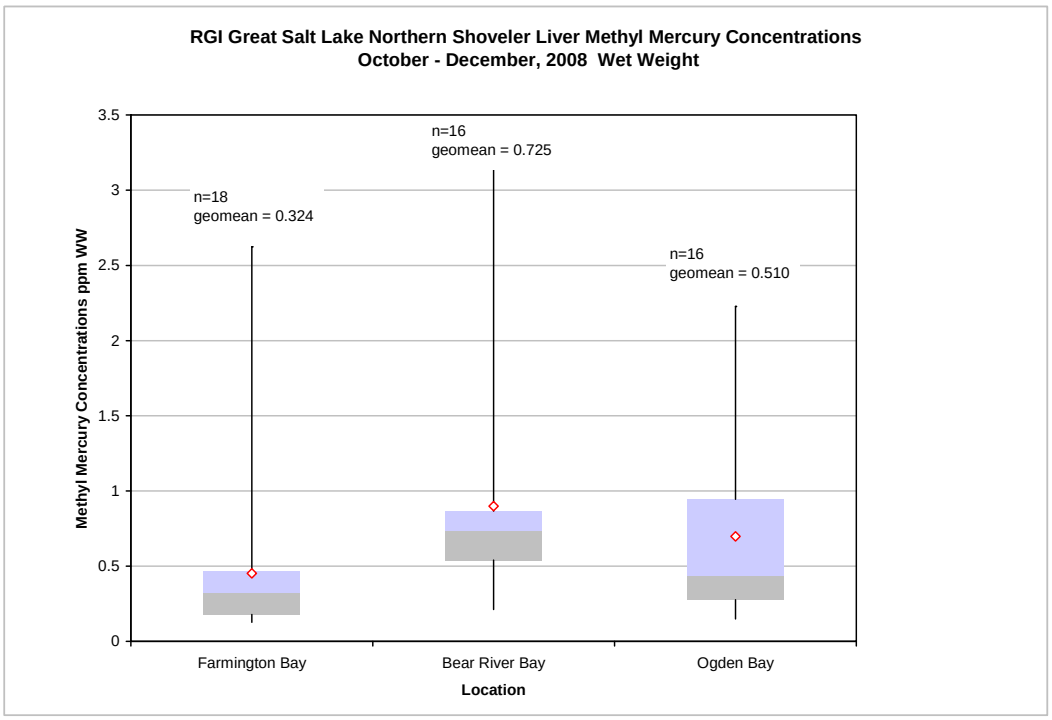


**Figure 1 Northern Shoveler Liver Methyl Mercury Concentrations (ppm ww) from Farmington Bay, Bear River Bay and Ogden Bay in October-December, 2008 collected per the RGI Grant**

### 6.1.3 Cinnamon Teal Liver Data

Figure 2 and Table 6 provide the data gathered for Cinnamon teal from Farmington Bay, Ogden Bay and Bear River Bay wetlands around GSL by the month they were collected. These data were collected by the USFWS and Utah Division of Wildlife Resources per the RGI Grant. An assumed percent liver moisture content of 68% was used as reported by USFWS, 2009 for Cinnamon Teal. At all sites, the average and the geometric mean body burdens of methyl mercury in the liver for Cinnamon teal fall within the low risk range (values less then 0.89 ppm wet weight). It will be important in future analyses to determine whether or not the apparent differences in mercury

concentrations between Common Goldeneye and Cinnamon Teal are related to feeding regimes, time spent at GSL as opposed to elsewhere in their migration, or species differences.

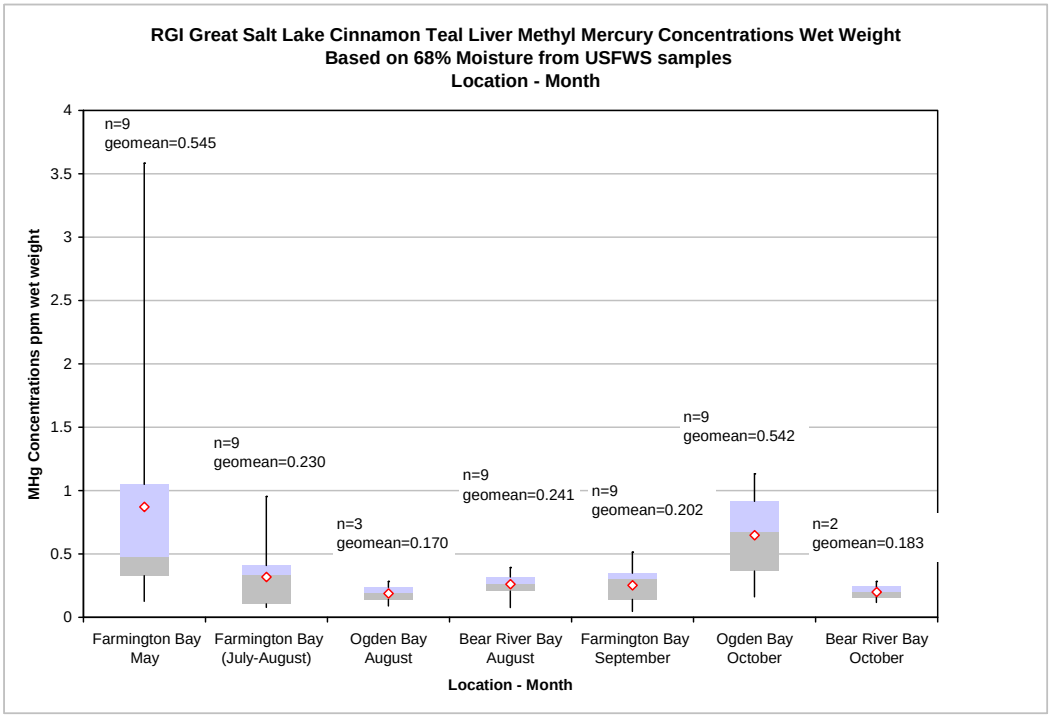


**Figure 2 Cinnamon Teal Liver Methyl Mercury Concentrations (ppm ww) from Farmington Bay, Bear River Bay and Ogden Bay in May-October, 2008 collected per the RGI Grant**

Some individuals sampled from Ogden Bay (Howard Slough) and Farmington Bay wetlands had liver mercury concentrations in the medium to high risk ranges. At Ogden Bay there were 2 samples out of a total 12 samples that fell within the medium risk range. At Farmington Bay three samples out of 27 fell within the medium risk range and one was in the high risk range. Again the relationship between these findings and mercury availability in the sampling locations need to be evaluated in detail.

### 6.1.4 Eared Grebe Liver Data

Figure 3 and Table 6 provides Eared Grebe liver data collected by USFWS in 1997, 1998, 2000 and 2006 from Gilbert Bay. Eared Grebes are an important species for this assessment as they arrive at GSL in the early fall and spend 3 to 4 months on the lake feeding almost exclusively on brine shrimp. It could be possible that increases in Eared Grebe liver concentrations of mercury over these 3 to 4 months reflect dietary exposure from GSL.

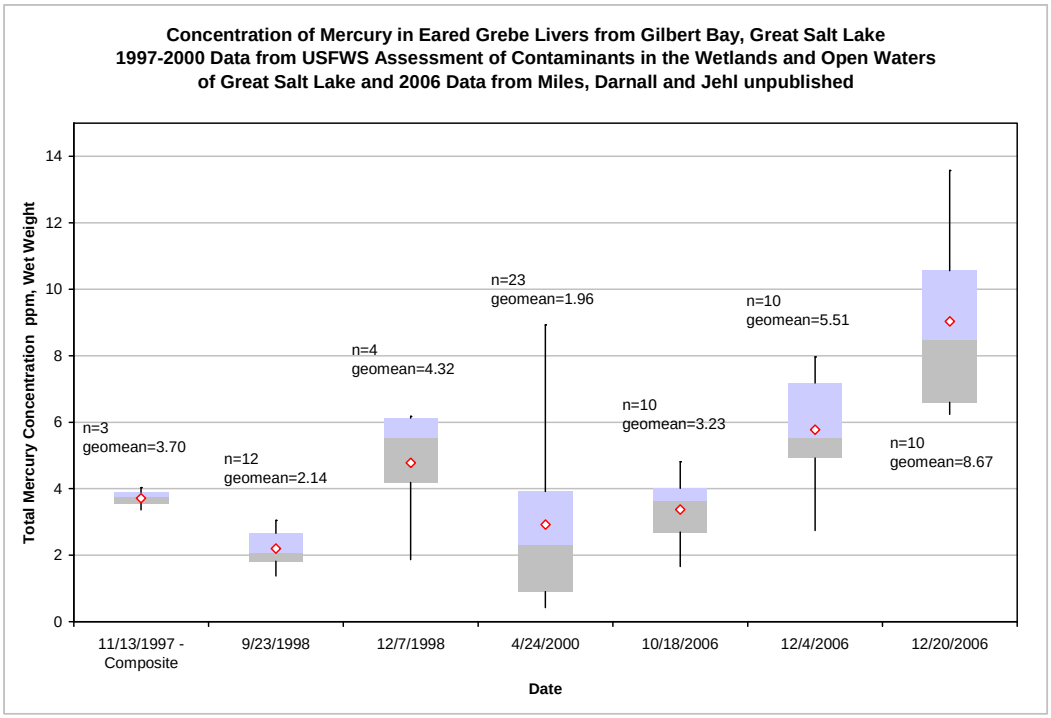


**Figure 3 Eared Grebe Total Mercury Concentration (ppm ww) collected by USFWS from Gilbert Bay in 1996-2000 and 2006**

For the Eared Grebe data, geometric mean liver concentrations were within the moderate risk range in May, 2000 and September 1998. In November 1997, October 2006 and early December 2006, the geometric mean liver concentrations were within the high risk range and in December 2006 they were in the extra high risk range. It appears in 2006 that there is a trend for increasing liver concentrations in Eared Grebes throughout the fall as the length of time they have spent feeding on the lake increases. This suggests that time spent at GSL may result in an increased body burden of mercury for Eared Grebes. In addition these data indicate that the median liver concentration for Eared Grebes populations may be increasing over the years. Additional data are needed to confirm these trends and the link between adult brine shrimp mercury concentrations.

## 6.2 COMPARISON OF GSL AVIAN EGG DATA AGAINST PROPOSED RISK RANGES AND BENCHMARKS

### 6.2.1 Cinnamon Teal Egg Data

Figure 4 shows Cinnamon Teal egg data collected from May 2 to July 1, 2008 from Bear River Bay (Unit 5C), Ogden Bay (Howard Slough) and Farmington Bay (Turpin Unit) around GSL. These data were collected by the USFWS and Utah Division of Wildlife Resources per the RGI Grant. Table 8 provides a summary of this egg data. For Cinnamon teal eggs, all geometric mean values for mercury concentrations were in the low risk range (values less then 0.5 ppm ww).

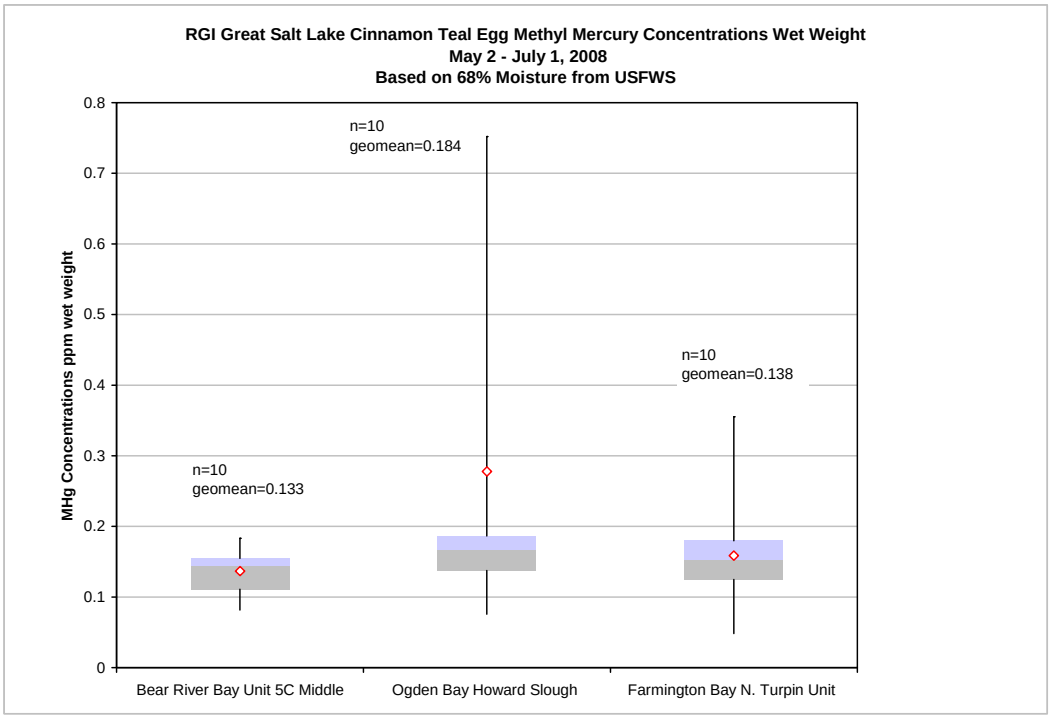


**Figure 4 Cinnamon Teal Methyl Mercury Egg Concentrations (ppm ww) from Farmington Bay, Bear River Bay and Ogden Bay in May-July, 2008 collected per the RGI Grant**

From these data, one would not expect reproductive effects for these species if these data are representative. Additional egg samples should be collected for species such as the Eared Grebe and the Common Goldeneye which have shown liver concentrations in the higher risk ranges. In addition, the relationship between feeding regimes, nesting areas and mercury concentrations in eggs should be evaluated.

## 6.3 COMPARISON OF GSL AVIAN BLOOD DATA AGAINST PROPOSED RISK RANGES AND BENCHMARKS

### 6.3.1 Blood Data for Eared Grebe

Table 8 provides a summary of the available avian blood data for the GSL.

Conover and Vest (2000) report blood concentrations for Eared Grebes sampled during the fall of 2006. In general, geometric mean values for both adults and juveniles fall in the moderate risk range.

## 6.4 COMPARISON OF GSL BRINE SHRIMP DATA AGAINST PROPOSED DIETARY RISK RANGES AND BENCHMARKS

### 6.4.1 Brine Shrimp Data

Brine shrimp represent one of the major dietary routes of mercury that must be evaluated for birds frequenting GSL. Other food-chain components including wetland macroinvertebrates, brine flies, brine fly larvae, and other items need to be sampled to provide a more complete picture of the avian dietary exposure path. Data from these other food sources were not available at the time of this report's preparation. Figures 5 and 6 illustrate the total mercury concentrations by month over all locations for cysts/napulii and adults respectively. Figures 7 and 8 illustrate the total mercury concentrations by location over all months for cysts/napulii and adults respectively. These data were collected by the Utah Division of Wildlife Resources/Great Salt Lake Ecosystem Program per the RGI Grant. Brine Table 9 provides a summary of these brine shrimp data. A 90% moisture content was used to convert from dry weight to wet weight based on the average percent moisture of 68 Brine shrimp samples reported in the USFWS in the Assessment of Contaminants in the Wetlands and Open Water of the Great salt Lake, Utah 1996-2000.

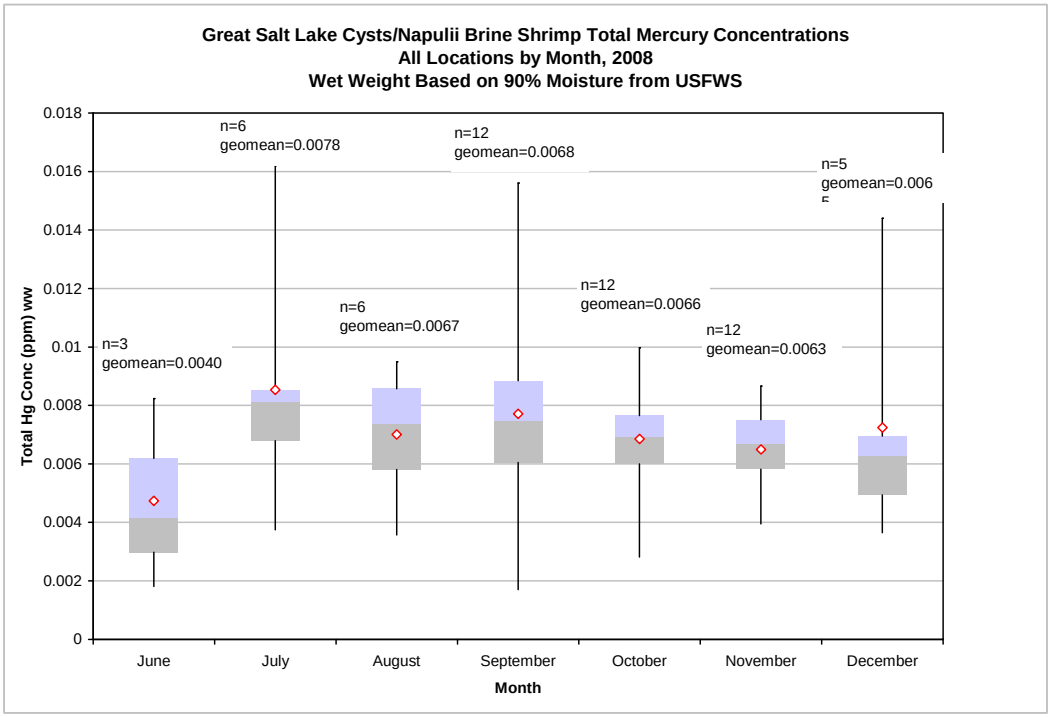


**Figure 5 Brine Shrimp Cysts/Napulii Total Mercury Concentrations (ppm ww) from Gilbert Bay in July-December, 2008 collected per the RGI Grant**

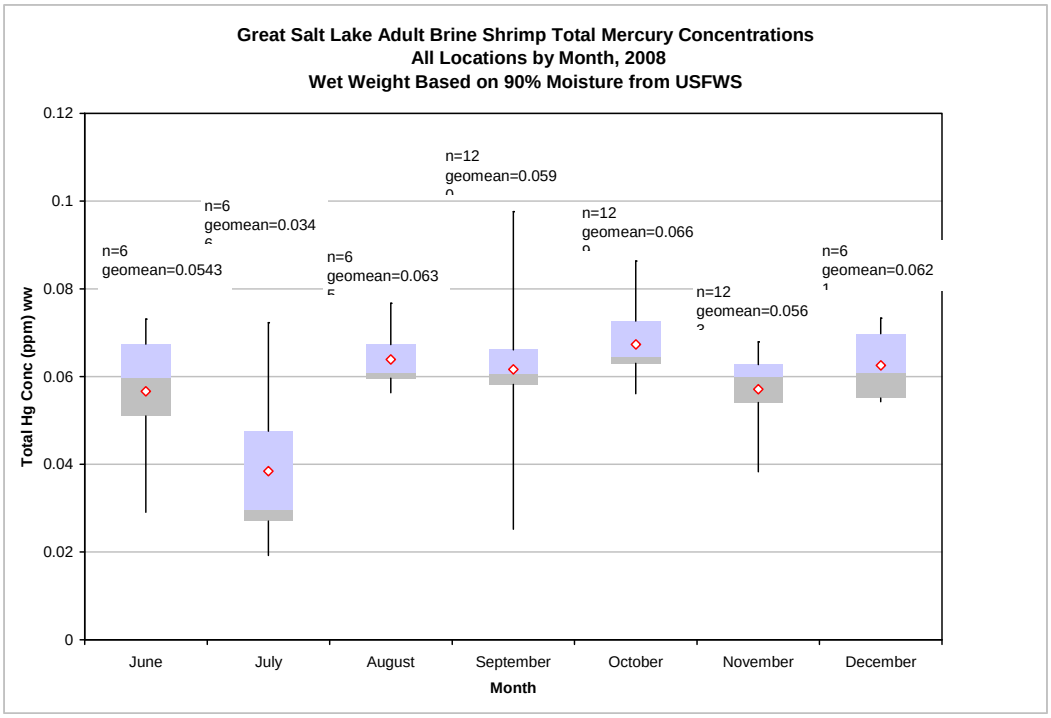


**Figure 6** **Brine Shrimp Adults Total Mercury Concentrations (ppm ww) from Gilbert Bay in July-December, 2008 collected per the RGI Grant**

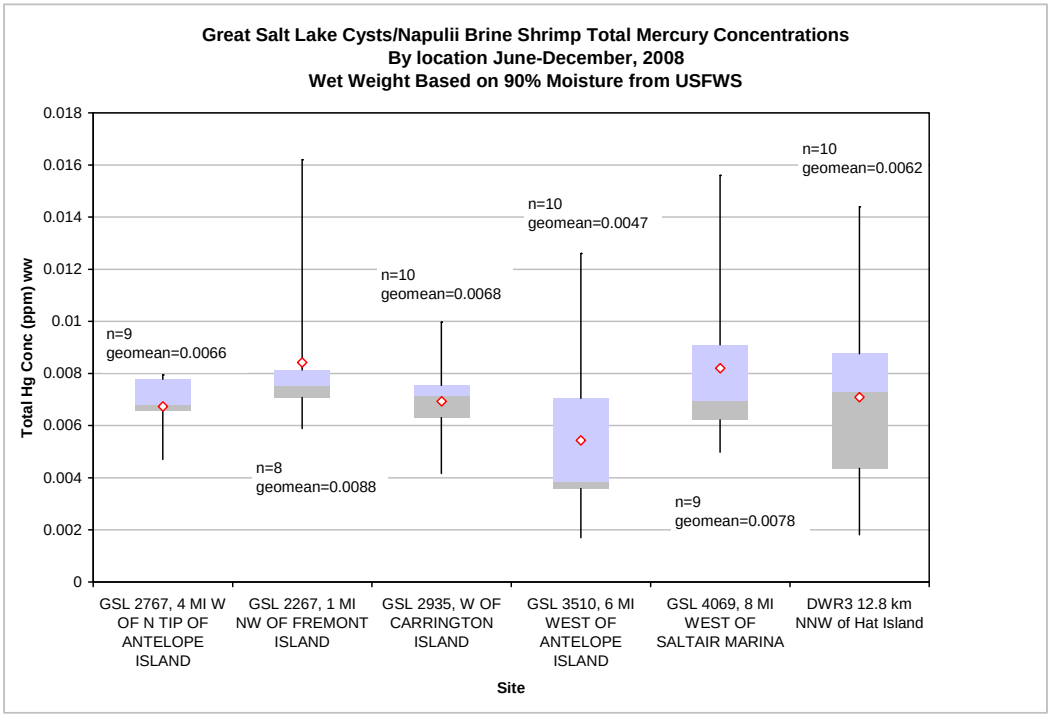


**Figure 7** **Brine Shrimp Cysts/Napulii Total Mercury Concentrations (ppm ww) from Gilbert Bay in July-December, 2008 by location collected per the RGI Grant**

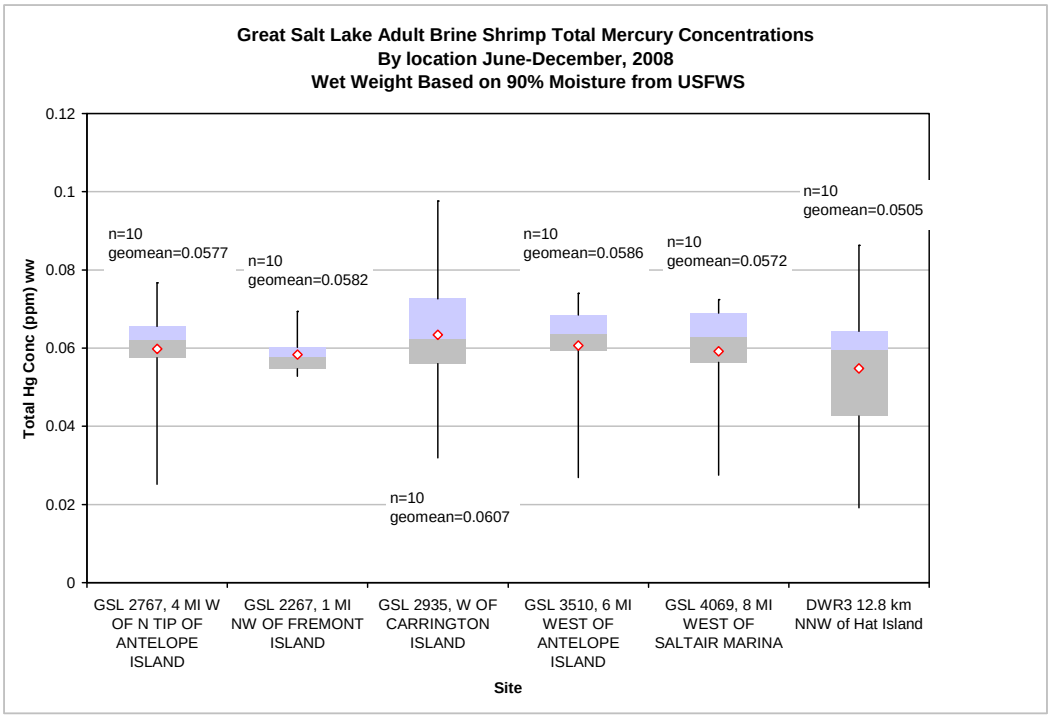


**Figure 8 Brine Shrimp Cysts/Adults Total Mercury Concentrations (ppm ww) from Gilbert Bay in July-December, 2008 by location collected per the RGI Grant**

Adult Brine Shrimp geometric mean values measured from June though December, 2008 fall within the low end of the moderate risk range. Cyst geometric mean concentrations are well within the low risk range. The geometric mean brine shrimp mercury concentrations did not vary between locations. Future analyses would determine if brine shrimp accumulate more mercury in the early season.

## 7. CONCLUSIONS

This section of the report provides available avian mercury data for GSL. It demonstrates the progress made to gather additional data for GSL and move forward in assessing this waterbody.

There are mixed findings associated with the potential for mercury risk to avian receptors at GSL. Based on the available data, Cinnamon teal body burdens and egg concentrations suggest that they are not at risk from mercury exposure. The link between the low risk tissue values and time spent at GSL has not been established. Hence it is not clear how long the sampled birds had been at the lake, what they were consuming, and the concentration of mercury in their food-chain.

Several species tested including the Common Goldeneye and Eared Grebe present body burdens that suggest the potential for moderate to high risk for health or reproductive effects. For the Common Goldeneye, the link between body burdens and time spent at GSL has not been established. However, the liver concentrations found in the Common Goldeneye are concerning. Northern Shoveler data collected from 2004 to 2006 as reported by

Vest 2008 show body burdens that indicate a moderate to high risk while the samples collected in 2008 per the RGI indicates there is low risk from Mercury exposure. It is not clear whether the differences are due to analytical procedures, exposure differences, time of collection, and location

For Eared Grebes, it appears that time spent at GSL consuming brine shrimp poses a risk for this species. The presence of selenium in the environment at GSL may help mitigate the toxic effects of mercury in adult birds (selenium and mercury tend to have antagonistic effects in adult birds). This possibility has not been evaluated in detail. Some literature suggests that the protection offered by selenium in the adult birds does not extend to the egg or hatchlings. Hence, egg samples for Eared Grebe and Common Goldeneye would be very useful.

Enough questions remain regarding the most appropriate benchmarks to use for data evaluation and the linkage between avian tissue concentrations and exposure to GSL to warrant further targeted study prior to listing of the waterbody on the 303(d) list. Peer review of the assessment presented in this document is required as well as expert review of the proposed benchmarks. It is expected that a listing decision can be made by the 2012 Integrated Reporting cycle.

## 8. NEXT STEPS

Expert support will be sought to develop a focused project plan to answer the questions that remain for this assessment. Based on the results of this initial effort, a detailed ecological risk assessment for mercury in the GSL is merited and an approach is presented in Part 2 of this document. The risk assessment will include milestones at which time stakeholders and experts will be given the opportunity to review and provide input.

Through this scoping level assessment, the workgroup has identified several important information/data gaps that must be addressed to move forward with the GSL assessment. Additional data to establish the food-chain mercury concentrations for Cinnamon teal, Common Goldeneye, Northern Shoveler, and other representative species, are required. Species sensitivity to mercury must be considered for additional data collection to ensure that the range of sensitive species is reflected in the assessment.

The relationship between food-chain exposure and body burden as determined from liver samples may be required. Additional blood samples should be collected as they reflect mercury exposures from recent feeding and will help to link body-burden data with time spent at GSL. Additionally, targeted egg samples should be collected as they reflect mercury exposure at the time of production and best predict reproductive risk levels. This will be important for species in which adult body burdens are elevated.

Various laboratories were used to analyze Mercury concentrations in the biological tissues presented in this assessment. Studies performed by USFWS and Vest used different laboratories then the RGI data. A laboratory round robin should be conducted to compare analytical results from these laboratories so that the data presented here can be verified.

This list of data gaps is not all inclusive and will be refined as the project plan is developed for the next phase of this assessment.

## 9. REFERENCES


Birds of North America Online, From the Cornell Lab of Ornithology and American Ornithologists Union. http://bna.birds.cornell.edu/bna

Birdnature. 2003. North American Migration Flyways. Available: http://www.birdnature.com/flyways.html.

El-Begearmi, M.M., M.L. Sunde, and H.E. Ganther. 1977. A mutual protective effect of mercury and selenium in Japanese quail. Poult Sci. 1977, Jan; 56(1):313-22.

Beyer et al. 1994 Estimates of Soil Ingestion by Wildlife. J Wildl. Manage. 8(2):375-382

Bird, H.R. Effect of selenium and mercury on survival of chick embryos. 1976. Poult Sci. Jul; 55(4):1423-8

Conover, M.R. and J.L. Vest. 2008. Selenium and Mercury Concentrations in California Gulls Breeding on the Great Salt Lake, Utah, USA. Environ. Tox. Chem.

EPA, 2003, EPA Wildlife Exposure Factors Handbook. EPA/600/R-93/187a, December 1993.

Gregus, Z., A. Gyurasics, I. Csanaky, and Z. Pinter. 2001. Effects of methylmercury and organic acid mercurials on the disposition of exogenous selenium in rats. Toxicol Appl Pharmacol. 2001, Jul 15; 174(2):177-87

Harriss, R.C., White, D., and MacFarlane, R. 1970. Mercury Compounds Reduce Photosynthesis in Plankton. Science. 170:736

Heinz, G.H. and D.J. Hoffman. 1998. Methylmercury chloride and selenomethionine interactions on health and reproduction in mallards. Environ Toxicol Chem 1998;17(2):139-45

Magos, L., T.W. Clarkson, S. Sparrow, and A.R. Hudson. 1987. Comparison of the protection given by selenite, selenomethionine and biological selenium against the renotoxicity of mercury. Arch Toxicol. 1987, Aug; 60(6):422-6

Parizek, J., I. Benes, I. Ostadalova, A. Babicky, and J. Benes. 1969

Metabolic interactions of trace elements. The effect of some inorganic and organic compounds of selenium on the metabolism of cadmium and mercury in the rat. Physiol. Bohemoslov.; 18(2): 95-103

Pandey, A.S., and T.H. MacRae. 1991. Toxicity of organic mercury compounds to the developing brine shrimp, Artemia. Ecotoxicol Environ Saf. Feb; 21(1):68-79

Santolo,G., and H. Ohlendorf. 2008. Technical Memorandum for Utah Division of Water Quality, Evaluation of Mercury Concentrations in Birds Collected from Great Salt Lake. April 7. http://www.deq.utah.gov/Issues/GSL_WQSC/docs/appendix/051408_Appendix_L.pdf

Utah Division of Wildlife Resources. Great Salt Lake Waterbird Survey, 1997-2001. http://wildlife.utah.gov/gsl/waterbirdsurvey/birds.htm

Utah Division of Wildlife Resources. 1999. Wildlife Notebook Series No. 6. Wilson's phalarope (*Phalaropus tricolor*). Available: http://www.wildlife.utah.gov/publications.

Utah Department of Natural Resources, Division of Wildlife Resources, Sensitive Species List, 2007.

Utah Division of Wildlife Resource (UDWR), 2010. Wildlife Disease in Utah Avian Cholera. Updated January 26, 2010. http://wildlife.utah.gov/diseases/avian_cholera.php

USEPA, 1998. Guidelines for Ecological Risk Assessment. EPA/630/R-95/002F

USEPA, 2009. Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, Final. January PA-823-R-09-002

Vest, J.L., M.R. Conover, C. Perschon, J. Luft, and J.O. Hall. 2009. Trace Element Concentrations in Wintering Waterfowl from Great Salt Lake. Arch. Environ. Contam. Toxicol. 56:302-316

Wurtsbaugh, W. 1995. Nutrient & Physical Factors Controlling Algal Production in the Great Salt Lake. March 15, 2005 presentation to the Great Salt Lake Steering Committee. http://www.deq.utah.gov/Issues/GSL_WQSC/docs/wdocs/Wayne.pdf

Yang, D.Y., Y.W. Chen, J.M. Gunn, and Nelson Belzile. 2008. Selenium and mercury in organisms: Interactions and mechanisms. Environ. Rev. 16:71-92

**Table 2 DIET - Evers Risk Levels Compared to Other Literature Benchmarks**

| DIET - Evers Risk Levels Compared to Other Literature Benchmarks<br>(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004) | | | | | |
|---|---|---|---|---|---|
| Reference | Low Risk in Diet<br>< 0.05 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Diet<br>0.05 – 0.15 mHg[1]<br>ppm (ww)[2] | High Risk in Diet<br>0.15 – 0.3 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Diet<br>>0.3 mHg[1]<br>ppm (ww)[2] | Organism |
| Barr 1986 | | | | 0.3 to 0.4 ww – reduced productivity;<br>>0.4 complete reproductive failure | Common loon |
| Heinz studies 1974, 1975, 1976a, b, 1979 | | | | 0.5 ppm fresh weight in diet<br>LOAEL[4] (Heinz reports this as equivalent to 0.1 ppm in actual diet based on ww calc.) for reproductive effects in 2nd and 3rd generation | Mallard |
| BHRN 1996[3] | | | | 3 ww Impact on reproduction<br>10 ww Lethal level | Threshold for birds in general |
| Borg et al 1970 | | | | 10 and 13<br>Behavior impacts | Goshawks |
| Bouton et | | | | 0.5 | Threshold for |

| DIET - Evers Risk Levels Compared to Other Literature Benchmarks<br>(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004) | | | | | |
|---|---|---|---|---|---|
| Reference | Low Risk in Diet<br>< 0.05 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Diet<br>0.05 – 0.15 mHg[1]<br>ppm (ww)[2] | High Risk in Diet<br>0.15 – 0.3 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Diet<br>>0.3 mHg[1]<br>ppm (ww)[2] | Organism |
| al (1999) | | | | LOAEL[4] Behavioral changes | birds in general |
| Burgess and Meyer 2008 | | | 0.21<br>EC50[5] Production | 0.41 EC100[6]<br>Estimate for<br>reproductive failure for population | Common loon |
| Eisler 1987 | | 0.1 ww LOAEL[4]<br>for dietary impacts | | | Birds in General |
| Evers 2003, 2004 | | 0.05 - 0.15<br>20% decrease in reproduction | >0.15<br>37% decrease in reproduction | | Common loon |
| Fimreite 1971 | | | | 2 to 3<br>Reproductive effects | Pheasants |
| Findley and Stendell 1978 | | | | 3<br>Egg hatching and chick survival impacted | Black ducks |

| DIET - Evers Risk Levels Compared to Other Literature Benchmarks<br>(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004) | | | | | |
|---|---|---|---|---|---|
| Reference | Low Risk in Diet<br>< 0.05 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Diet<br>0.05 – 0.15 mHg[1]<br>ppm (ww)[2] | High Risk in Diet<br>0.15 – 0.3 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Diet<br>>0.3 mHg[1]<br>ppm (ww)[2] | Organism |
| Finley et al 1979 | | | | 40<br>Lethal level | Cowbirds, grackles, starlings, black birds |
| Gardiner 1972 | | | | 32<br>LC90[7] | Pheasants |
| Gullvag et al 1978 | | | | 8<br>Liver cell damage | Quail |
| Chan et al_2003 | | 0.1<br>LOAEL[4] Reproduction | | | Birds in general |
| Heinz and Hoffman 1998 | | | | 10<br>Embryo deformities | Mallard |

| DIET - Evers Risk Levels Compared to Other Literature Benchmarks<br>(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004) | | | | | |
|---|---|---|---|---|---|
| Reference | Low Risk in Diet<br>< 0.05 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Diet<br>0.05 – 0.15 mHg[1]<br>ppm (ww)[2] | High Risk in Diet<br>0.15 – 0.3 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Diet<br>>0.3 mHg[1]<br>ppm (ww)[2] | Organism |
| Koeman et al, 1971) | | | | 13.3<br>LC90[7] | Kestrels |
| Meyer 2006 | | 0.08 ww NOAEL[8] Behavioral/neurological effects | | 0.4 ww LOAEL[4] for neurological impacts in chicks | Common loon – controlled feeding study |
| Nicholson and Osborn 1984 | | | | 1.1<br>Nephrotoxic lesions | Starlings |
| Scheuhammer (1988), Spalding et al (2000) | | | | 5 LOAEL[4] Neurological impacts | Birds in General |
| Schuhammer 1991 | | | | >1 dw (need to | Piscivorous |

| DIET - Evers Risk Levels Compared to Other Literature Benchmarks<br>(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004) | | | | | |
|---|---|---|---|---|---|
| Reference | Low Risk in Diet<br>< 0.05 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Diet<br>0.05 – 0.15 mHg[1]<br>ppm (ww)[2] | High Risk in Diet<br>0.15 – 0.3 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Diet<br>>0.3 mHg[1]<br>ppm (ww)[2] | Organism |
| concluded this from Heinz and Barr studies | | | | translate to ww) Subletha l effects | Birds in general |
| Spalding et al 2000a | | | | 0.5<br>LOAEL[4]<br>Behavior, Growth, Immune function, Histological changes, Biochemical changes | Great Egrets |
| Spann et al 1972 | | | | 4.2<br>Lethal level | Ring-necked pheasants |
| Burgess_2008 | | | 0.21<br>EC50[5] Productivity | 0.41<br>EC100[6] Productivity | Common Loon |
| Eisler 1987, Fimreite1 | | | | 2.2 to 28.3 (check ww or dw)<br>LD50[9] or greater | Mallard, Norther |

| DIET - Evers Risk Levels Compared to Other Literature Benchmarks<br>(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004) | | | | | |
|---|---|---|---|---|---|
| Reference | Low Risk in Diet<br>< 0.05 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Diet<br>0.05 – 0.15 mHg[1]<br>ppm (ww)[2] | High Risk in Diet<br>0.15 – 0.3 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Diet<br>>0.3 mHg[1]<br>ppm (ww)[2] | Organism |
| 979, Scheuhammer 1987 | | | | | n bobwhite, quail |
| Thompson 1996 | | | | 0.6 Threshold for impaired reproduction | Birds in general |

1 mHg = methyl mercury

2 ppm (ww) = parts per million wet weight

3 Beyer, Heinz, Redmon, Norwood 1996

4 LOAEL = lowest observed adverse effect level

5 EC50 = effective concentration 50% of test organisms

6 EC100 = effective concentration 100% of test organisms

7 LC90 = lethal concentration 90% of test organisms

8 NOAEL = no observed adverse effect level

9 LD50 = lethal dose 50% of test organisms

**Table 3 EGG - Evers Risk Levels Compared to Other Literature Benchmarks**

| EGG - Evers Risk Levels Compared to Other Literature Benchmarks<br>(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004) | | | | | |
|---|---|---|---|---|---|
| Reference | Low Risk in Eggs<br>0 – 0.5 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Eggs<br>0.5 – 1.3 mHg[1]<br>ppm (ww)[2] | High Risk in Eggs<br>1.3 -2.0 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Eggs<br>>2.0 mHg[1]<br>ppm (ww)[2] | Organism/<br>Notes |
| Barr 1986 | 0.2 – 0.3<br>LOAEL[5]<br>Reproduction | | | | Loon |
| BHRN 1996[3] | | 0.5<br>LOAEL[5]<br>Reproduction | | | General Bird |
| BHRN 1996[3] | | 0.5 to 2.0<br>Range where reproductive effects noted | | | General Bird |
| Borg 1969 | | | 1.3 – 2.0<br>Impacts on hatch rate | | Ring-necked pheasants |

| EGG - Evers Risk Levels Compared to Other Literature Benchmarks<br>(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004) | | | | | |
|---|---|---|---|---|---|
| Reference | Low Risk in Eggs<br>0 – 0.5 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Eggs<br>0.5 – 1.3 mHg[1]<br>ppm (ww)[2] | High Risk in Eggs<br>1.3 -2.0 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Eggs<br>>2.0 mHg[1]<br>ppm (ww)[2] | Organism/<br>Notes |
| Eisler 1996 | | | >0.9 to 2.0<br>Threshold of reproductive impacts | | General Bird |
| Evers 2003 | | | 1.3<br>reproductive impacts | | Common Loon |
| Fimreite 1971 | | 0.5<br>LOAEL[5]<br>Reproduction | | | Birds reproduction in general |
| Heinz 1974, 1976 a and b, 1979 | | 0.5<br>LOAEL[5]<br>Reproduction, behavior, growth | | | Mallard |

| EGG - Evers Risk Levels Compared to Other Literature Benchmarks<br>(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004) | | | | | |
|---|---|---|---|---|---|
| Reference | Low Risk in Eggs<br>0 – 0.5 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Eggs<br>0.5 – 1.3 mHg[1]<br>ppm (ww)[2] | High Risk in Eggs<br>1.3 -2.0 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Eggs<br>>2.0 mHg[1]<br>ppm (ww)[2] | Organism/<br>Notes |
| Heinz et al, 2008[4] | 0.12 LC50[6] White Ibis, Falcon;<br>0.15 LC50[6] Snowy egret;<br>0.18 LC50[6] Osprey;<br>0.22 LC50[6] Tri-colored heron;<br>0.44 LC50[6] Ring-necked pheasant and Chicken | 0.97 LC50[6] Canada Goose;<br>1.23 LC50[6] Hooded Merganser; | 1.53 LC50[6] Lesser scaup<br>1.79 LC50[6] Mallard | | LC50 for mHg to embryos of injected eggs |
| Heinz et al, 2008[4] | 0.26 LC50[6] Common grackle;<br>0.28 LC50[6] Herring gull;<br>0.32 LC50[6] Tree swallow;<br>0.33 LC50[6]Clapper rail;<br>0.40 LC50[6] Royal Tern | 0.56 LC50[6] Anhinga;<br>0.76 LC50[6] Sandhill crane;<br>0.87 LC50[6] Common Tern;<br>0.89 LC50[6] Brown Pelican;<br>1.25 LC50[6] Laughing gull | | 2.42 LC50[6]<br>Double-crested cormorant;<br>4.33 LC50[6] American avocet | LC50 for mHg to embryos of injected eggs |

**EGG - Evers Risk Levels Compared to Other Literature Benchmarks**

**(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004)**

| Reference | Low Risk in Eggs<br>0 – 0.5 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Eggs<br>0.5 – 1.3 mHg[1]<br>ppm (ww)[2] | High Risk in Eggs<br>1.3 -2.0 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Eggs<br>>2.0 mHg[1]<br>ppm (ww)[2] | Organism/<br>Notes |
|---|---|---|---|---|---|
| Fimreite 1974 | | 1.0<br>LOAEL[5]<br>Reproduction | | 3.5<br>73% hatch failure | Common Tern reproduction |
| Heinz and Hoffman 2003 | | | | 2.3<br>neurological impacts | Mallards |
| Keck et al. 1982 | 0.1 – 0.3<br>Egg sterility | | | | Peregrine Falcon |
| Newton & Hass 1988 | | 0.6<br>decreased brood size | | | Merlin |

**EGG - Evers Risk Levels Compared to Other Literature Benchmarks**

**(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers et al. 2004)**

| Reference | Low Risk in Eggs<br>0 – 0.5 mHg[1]<br>ppm (ww)[2] | Moderate Risk in Eggs<br>0.5 – 1.3 mHg[1]<br>ppm (ww)[2] | High Risk in Eggs<br>1.3 -2.0 mHg[1]<br>ppm (ww)[2] | Extra High Risk in Eggs<br>>2.0 mHg[1]<br>ppm (ww)[2] | Organism/<br>Notes |
|---|---|---|---|---|---|
| Nyanza River Eco Risk Assess. | 0.09<br>NOAEL[7] Reproduction<br>0.16<br>LOAEL[5] Reproduction | | | | Bird Thresholds in general |
| Wiemer et al. 2007 | 0.18 – 0.47<br>NOAEL[7] | | | | American White Pelican |
| Wolfe et al. 1998 | | 1.0 – 3.6 range of significant toxic effects | | | Water birds in General |

Reported values for effect levels may be based upon total mercury analysis if methyl mercury not analyzed. These then are conservative values when compared to methyl mercury benchmarks.

1 mHg = methyl mercury

2 ppm (ww) = parts per million wet weight

3 Beyer, Heinz, Redmon, Norwood 1996

4 Heinz et al. 2008 egg injection study. Heinz reports that toxicity of mHg injected into egg is greater than same concentration deposited via mother. These benchmarks may overestimate impacts to embryos.

5 LOAEL = lowest observed adverse effect level

6 LC50 = lethal concentration 50% of test species

7 NOAEL = No observed adverse effect level

**Table 4 BLOOD - Evers Risk Levels Compared to Other Literature Benchmarks**

| **BLOOD - Evers Risk Levels Compared to Other Literature Benchmarks**<br>**(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers 2004)** | | | | | |
|---|---|---|---|---|---|
| Reference | Low Risk in Blood<br>0 - <1.0 mHg[1]<br>ppm (ww) [2] | Moderate Risk in Blood<br>1.0 – <3.0 mHg[1]<br>ppm (ww) [2] | High Risk in Blood<br>3.0 – <4.0 mHg[1]<br>ppm (ww) [2] | Extra High Risk in Blood<br>>4.0 mHg[1]<br>ppm (ww) [2] | Organism/<br>Notes |
| Evers 2008 | <1.0 NOAEL[4]<br># Fledglings produced | | | | Common Loon |

**BLOOD - Evers Risk Levels Compared to Other Literature Benchmarks**

**(Evers Risk Categories based on body of Evers' Literature and ranges published in Evers 2004)**

| Reference | Low Risk in Blood<br>0 - <1.0 mHg[1]<br>ppm (ww) [2] | Moderate Risk in Blood<br>1.0 – <3.0 mHg[1]<br>ppm (ww) [2] | High Risk in Blood<br>3.0 – <4.0 mHg[1]<br>ppm (ww) [2] | Extra High Risk in Blood<br>>4.0 mHg[1]<br>ppm (ww) [2] | Organism/<br>Notes |
|---|---|---|---|---|---|
| Nocera and Taylor – Nyanza River ERA | | 1.25 LOAEL[3] for Chick Behavior | | | Common Loon |
| Evers 2008 | | | >3.0 LOAEL[3] L for #Fledglings produced (41% reduction as compared to <1.0 NOAEL[4]) | | Common Loon |
| Burgess 2008 | | | 4.3 in adult EC50[5] for #Chicks produced per pair | | Common Loon |
| Burgess 2008 | | | | 8.6 in adult EC100[6] (no chicks produced per pair) | Common Loon |
| Spalding et. al 2000 | | | | 12 LOAEL[3] for Juvenille behavior | Great White Egrets |

1 mHg = methyl mercury

2 ppm (ww) = parts per million wet weight

3 LOAEL = lowest observed adverse effect level

4 NOAEL = No observed adverse effect level

5 EC50 = effective concentration 50% of test organisms

6 EC100 = effective concentration 100% of test organisms

**Table 5 LIVER - GSL Team Risk Levels Compared to Literature Benchmarks**

| LIVER - GSL Team Risk Levels Compared to Literature Benchmarks | | | | | |
|---|---|---|---|---|---|
| Reference | *Low Risk in Liver<br><0.89 Hg[1]<br>ppm (ww) [2] | **Moderate Risk in Liver<br>0.89 – <2.0 Hg[1]<br>ppm (ww) [2] | ***High Risk in Liver<br>2.0 -6.0 Hg[1]<br>ppm (ww) [2] | ****Extra High Risk in Liver<br>>6.0 Hg[1]<br>ppm (ww) [2] | Organism/<br>Notes |
| Heinz 1976a | | 0.89 (mHg)<br>LOAEL[3] reproductive impacts | | | Mallards |
| Gochfeld 1980 | | 1.06<br>NOAEL[4] | | | Common tern |

| LIVER - GSL Team Risk Levels Compared to Literature Benchmarks | | | | | |
|---|---|---|---|---|---|
| Reference | *Low Risk in Liver<br><0.89 Hg[1]<br>ppm (ww) [2] | **Moderate Risk in Liver<br>0.89 – <2.0 Hg[1]<br>ppm (ww) [2] | ***High Risk in Liver<br>2.0 -6.0 Hg[1]<br>ppm (ww) [2] | ****Extra High Risk in Liver<br>>6.0 Hg[1]<br>ppm (ww) [2] | Organism/<br>Notes |
| Scheuhammer 1987 | | | 2.0<br>Reproductive impacts | | Pheasants |
| Fimreite 1971; Heinz 1976 a,b | | | 2 to 12<br>impact on reproduction and mortality | | Pheasants and Mallards |
| Zillioux et al 1993 | | | 5.0<br>Conservative threshold for sign. toxic effects | | Birds in general |
| Barr 1986 | | | 3.0 to 13.7<br>decreased hatchability | | Common loon |

| LIVER - GSL Team Risk Levels Compared to Literature Benchmarks | | | | | |
|---|---|---|---|---|---|
| Reference | *Low Risk in Liver<br><0.89 Hg[1]<br>ppm (ww) [2] | **Moderate Risk in Liver<br>0.89 – <2.0 Hg[1]<br>ppm (ww) [2] | ***High Risk in Liver<br>2.0 -6.0 Hg[1]<br>ppm (ww) [2] | ****Extra High Risk in Liver<br>>6.0 Hg[1]<br>ppm (ww) [2] | Organism/<br>Notes |
| Spalding et al 1994 | | | | >6<br>Correlated with mortality from chronic disease | Great white heron |
| Spalding et al 1991 | | | | 7.2<br>increased disease and emaciation | Great white heron |
| Finley and Stendell 1978 | | | | 9.08<br>Reduced nesting success | Common tern |
| Spalding et al. 2000 | | | | 15 impacts on growth, appetite, hygiene | Great egrets |

| LIVER - GSL Team Risk Levels Compared to Literature Benchmarks | | | | | |
|---|---|---|---|---|---|
| Reference | *Low Risk in Liver<br><0.89 Hg[1]<br>ppm (ww) [2] | **Moderate Risk in Liver<br>0.89 – <2.0 Hg[1]<br>ppm (ww) [2] | ***High Risk in Liver<br>2.0 -6.0 Hg[1]<br>ppm (ww) [2] | ****Extra High Risk in Liver<br>>6.0 Hg[1]<br>ppm (ww) [2] | Organism/<br>Notes |
| Finley and Stendall 1978 | | | | 20.7 Reduced hatching success | Common tern |
| Thompson 1996 | | | | 20 – 30 range of significant toxic effect | Non-marine birds |
| Spalding et al. 1994 | | | | 27.5<br>10%-12% fledge rate | Common tern |
| Barr 1986 | | | | 29.7 Reduced nesting success | Common loon |
| Heinz 1974 | | | | 30 Threshold neurological effects | Birds in general |

| LIVER - GSL Team Risk Levels Compared to Literature Benchmarks | | | | | |
|---|---|---|---|---|---|
| Reference | *Low Risk in Liver<br><0.89 Hg[1]<br>ppm (ww) [2] | **Moderate Risk in Liver<br>0.89 – <2.0 Hg[1]<br>ppm (ww) [2] | ***High Risk in Liver<br>2.0 -6.0 Hg[1]<br>ppm (ww) [2] | ****Extra High Risk in Liver<br>>6.0 Hg[1]<br>ppm (ww) [2] | Organism/<br>Notes |
| BHRN 1996[6] | | | | 30 Threshold for survival | Birds in general |
| Scheuhammer 1991 | | | | 30 Frank neurological effects | Birds in general |
| Weimeyer et al. 1987 | | | | 35<br>death | Osprey |
| Barr 1986 | | | | 51.9 Reduced hatching success | Common loon |
| Finley et al 1979 | | | | 54.5<br>LD33[5] | Common grackle |

* Low risk – below LOEL for Mallard reproductive impacts

**Medium risk – From LOAEL to threshold for sublethal effects noted by several authors including Fimreite 1971, Heinz 1976 a, b; Scheuhammer 1987

***High Risk – from sublethal effects threshold to the threshold for major toxic effects suggest by Zillioux et al. 1993 and Spalding et al. 1994.

****Extra High Risk – includes concentrations above which long term survival significantly impacted.

1 mHg = methyl mercury

2 ppm (ww) = parts per million wet weight

3 LOAEL = lowest observed adverse effect level

4 NOAEL = No observed adverse effect level

5 LC33 = lethal concentration 33% of test species

6 Beyer, Heinz, Redmon, Norwood 1996

**Table 6 GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver <0.89 Hg[1] ppm (ww)[2] | **Moderate Risk in Liver 0.89 – <2.0 Hg[1] ppm (ww)[2] | ***High Risk in Liver 2.0 -6.0 Hg[1] ppm (ww)[2] | ****Extra High Risk in Liver >6.0 Hg[1] ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver <0.89 Hg[1] ppm (ww)[2] | **Moderate Risk in Liver 0.89 – <2.0 Hg[1] ppm (ww)[2] | ***High Risk in Liver 2.0 -6.0 Hg[1] ppm (ww)[2] | ****Extra High Risk in Liver >6.0 Hg[1] ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| Common Goldeneye | Nov 20 – Dec 31<br>2004-2006 | GSL | | | Females<br>3.1 geometric mean<br>0.9 – 13.8 range<br>2.3 – 4.2 95% CI<br>males<br>4.4 geometric mean<br>0.9 – 33.7 range<br>3.2 – 6.1, 95% CI<br>n=40 | | Vest et al. 2009 |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver <0.89 Hg[1] ppm (ww)[2] | **Moderate Risk in Liver 0.89 – <2.0 Hg[1] ppm (ww)[2] | ***High Risk in Liver 2.0 -6.0 Hg[1] ppm (ww)[2] | ****Extra High Risk in Liver >6.0 Hg[1] ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| | Jan 1 – Feb 27 2004-2006 | GSL | | | | Females 14.0 geometric mean 0.4 – 38. range 10.1 – 19.4 95% CI Males 14.6 geometric mean 1.4–31.9 range 10.4 – 20.3 95% CI males n=37 | Vest et al. 2009 |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver <0.89 Hg[1] ppm (ww)[2] | **Moderate Risk in Liver 0.89 – <2.0 Hg[1] ppm (ww)[2] | ***High Risk in Liver 2.0 -6.0 Hg[1] ppm (ww)[2] | ****Extra High Risk in Liver >6.0 Hg[1] ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| | Feb 28-April 5 2004 - 2006 | GSL | | | | females 8.5 geometric mean 1.0 – 46.1 range 6.3 – 11.6 95% CI | Vest et al. 2009 |
| | | | | | | males 13.7 geometric mean 0.3 – 71.5 range 10.0 – 18.7 95% CI n = 43 | |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver <0.89 Hg[1] ppm (ww)[2] | **Moderate Risk in Liver 0.89 – <2.0 Hg[1] ppm (ww)[2] | ***High Risk in Liver 2.0 -6.0 Hg[1] ppm (ww)[2] | ****Extra High Risk in Liver >6.0 Hg[1] ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| Northern Shovelers | November 2004-2006 | Open Waters | | 1.79 geometric mean<br>0.18 to 15.2 range<br>(n=13) | | | Vest et al. 2009 |
| | December 2004-2006 | Open Waters | | | 3.86 geometric mean<br>0.86 to 10.73 range<br>(n=42) | | Vest et al. 2009 |
| | February 2004-2006 | Open Waters | | | 3.64 geometric mean<br>1.19 to 11.9 range<br>(n=28) | | Vest et al. 2009 |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver<br><0.89 Hg[1]<br>ppm (ww)[2] | **Moderate Risk in Liver<br>0.89 – <2.0 Hg[1]<br>ppm (ww)[2] | ***High Risk in Liver<br>2.0 -6.0 Hg[1]<br>ppm (ww)[2] | ****Extra High Risk in Liver<br>>6.0 Hg[1]<br>ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| | October – December, 2008 | Bear River | 0.725 geomean mHg<br>0.212 to 3.161 range mHg;<br>(n=16) | | | | RGI Data |
| | October – December, 2008 | Ogden Bay | 0.510 geomean mHg<br>0.149 to 2.227 range mHg;<br>(n=16) | | | | RGI Data |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver <0.89 Hg[1] ppm (ww)[2] | **Moderate Risk in Liver 0.89 – <2.0 Hg[1] ppm (ww)[2] | ***High Risk in Liver 2.0 -6.0 Hg[1] ppm (ww)[2] | ****Extra High Risk in Liver >6.0 Hg[1] ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| | October – December, 2008 | Farmington Bay | 0.324 geomean mHg<br>0.127 to 2.625 range mHg;<br>(n=18) | | | | RGI Data |
| Cinnamon Teal | August and October<br>2008 | Bear River Wetlands | August:<br>0.241 geomean mHg 0.078 to 0.394 range mHg;<br>(n=9) | | | | RGI Data |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver<br><0.89 Hg[1]<br>ppm (ww)[2] | **Moderate Risk in Liver<br>0.89 – <2.0 Hg[1]<br>ppm (ww)[2] | ***High Risk in Liver<br>2.0 -6.0 Hg[1]<br>ppm (ww)[2] | ****Extra High Risk in Liver<br>>6.0 Hg[1]<br>ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| | | | October<br>0.183 geomean mHg<br>0.118 to 0.283 range mHg;<br>(n=2) | | | | |
| | August and October<br>2008 | Ogden Bay: Howard Slough | August:<br>0.170 geomean mHg<br>0.090 to 0.284 range mHg;<br>(n=3) | | | | RGI Data |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver<br><0.89 Hg[1]<br>ppm (ww)[2] | **Moderate Risk in Liver<br>0.89 – <2.0 Hg[1]<br>ppm (ww)[2] | ***High Risk in Liver<br>2.0 -6.0 Hg[1]<br>ppm (ww)[2] | ****Extra High Risk in Liver<br>>6.0 Hg[1]<br>ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| | | | October:<br>0.542 geomean mHg<br>0.163 to 1.133 range mHg;<br>(n=2) | | | | |
| | May, July-August, September 2008 | Farmington Bay Wetlands | May:<br>0.545 geomean mHg<br>0.178 to 3.584 range mHg;<br>(n=9) | | | | RGI Data |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver <0.89 Hg[1] ppm (ww)[2] | **Moderate Risk in Liver 0.89 – <2.0 Hg[1] ppm (ww)[2] | ***High Risk in Liver 2.0 -6.0 Hg[1] ppm (ww)[2] | ****Extra High Risk in Liver >6.0 Hg[1] ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| | | | July-August: 0.230 geomean mHg<br>0.079 to 0.954 range mHg;<br>(n=9) | | | | |
| | | | September: 0.202 geomean mHg<br>0.464 to 0.515 range mHg;<br>(n=9) | | | | |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver <0.89 Hg[1] ppm (ww)[2] | **Moderate Risk in Liver 0.89 – <2.0 Hg[1] ppm (ww)[2] | ***High Risk in Liver 2.0 -6.0 Hg[1] ppm (ww)[2] | ****Extra High Risk in Liver >6.0 Hg[1] ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| Eared Grebe | Nov 1997 | Gilbert Bay | | | 3.7 geomean mHg<br>3.36 to 4.03 range mHg;<br>(n= 3 composites sample) | | FWS Report 2009 |
| | Sept 1998 | Gilbert Bay | | 2.14 geomean mHg<br>1.38 to 3.04 range mHg;<br>(n= 12) | | | |
| | Dec 1998 | Gilbert Bay | | | 4.32 geomean mHg<br>1.87 to 6.18 range mHg;<br>(n= 4) | | |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver <0.89 Hg[1] ppm (ww)[2] | **Moderate Risk in Liver 0.89 – <2.0 Hg[1] ppm (ww)[2] | ***High Risk in Liver 2.0 -6.0 Hg[1] ppm (ww)[2] | ****Extra High Risk in Liver >6.0 Hg[1] ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| | May 2000 | Gilbert Bay | | 1.96 geomean mHg 0.425 to 8.93range mHg; (n= 23) | | | |
| | October 2006 | Gilbert Bay | | 3.23 geomean mHg 1.66 to 4.81range mHg; (n= 10) | | | USFWS Data from Miles, Darnall and Jehl (unpublished) |
| | December 4 2006 | Gilbert Bay | | | 5.51 geomean mHg 2.74 to 7.96 range mHg; (n= 10) | | USFWS Data from Miles, Darnall and Jehl (unpublished) |

**GSL Avian Liver Data Comparison with Liver Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | *Low Risk in Liver <0.89 Hg[1] ppm (ww)[2] | **Moderate Risk in Liver 0.89 – <2.0 Hg[1] ppm (ww)[2] | ***High Risk in Liver 2.0 -6.0 Hg[1] ppm (ww)[2] | ****Extra High Risk in Liver >6.0 Hg[1] ppm (ww)[2] | References/Notes |
|---|---|---|---|---|---|---|---|
| | | | | | | 8.67 geomean mHg | |
| | December 20 2006 | Gilbert Bay | | | | 6.24 to 13.58range mHg; (n= 10) | USFWS Data from Miles, Darnall and Jehl (unpublished) |

**Table 7 GSL Egg Data Comparison with Egg Risk Ranges for Hg**

**GSL Egg Data Comparison with Egg Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | Low Risk in Eggs 0 – 0.5 mHg[1] ppm (ww)[2] | Moderate Risk in Eggs 0.5 – 1.3 mHg[1] ppm (ww)[2] | High Risk in Eggs 1.3 -2.0 mHg[1] ppm (ww)[2] | Extra High Risk in Eggs >2.0 mHg[1] ppm (ww)[2] | References |
|---|---|---|---|---|---|---|---|
| | May 2 to July 1 2008 | Bear River Wetlands | 0.133 geomean mHg 0.082 to 0.183 range mHg; (n= 10) | | | | |
| Cinnamon Teal | May 2 to July 1 2008 | Ogden Bay: Howard Slough | 0.18 geomean mHg 0.08 to 0.75range mHg; (n= 10) | | | | RGI Grant |
| | May 2 to July 1 2008 | Farmington Bay Wetlands | 0.138 geomean mHg 0.05 to 0.36range mHg; (n= 10) | | | | |

**Table 8 GSL Blood Data Comparison with Evers Risk Ranges for Hg**

**GSL Blood Data Comparison with Evers Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | Low Risk in Blood 0 - <1.0 mHg[1] ppm (ww)[2] | Moderate Risk in Blood 1.0 – <3.0 mHg[1] ppm (ww)[2] | High Risk in Blood 3.0 – <4.0 mHg[1] ppm (ww)[2] | Extra High Risk in Blood >4.0 mHg[1] ppm (ww)[2] | References |
|---|---|---|---|---|---|---|---|
| Eared Grebes adults | Fall 2006 | Antelope Island | 0.86 geomean (n=30) | | | | Conover & Vest 2009 |
| | Fall 2006 | Stansbury Island | | 2.02 geomean (n=30) | | | |
| | Sept. 2006 | Antelope & Stansbury Island | | 1.12 geomean (n=30) | | | |
| | Nov. 2006 | Antelope & Stansbury Island | | 1.68 geomean (n=30) | | | |
| Eared Grebes juvenile | Fall 2006 | Antelope & Stansbury Island | | 1.10 geomean | | | |
| Eared Grebes adult | Fall 2006 | Antelope & Stansbury Island | | 1.68 geomean | | | |

**Table 9 GSL Diet Data Comparison with Evers Risk Ranges for Hg**

**GSL Diet Data Comparison with Evers Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | Low Risk in Diet < 0.05 mHg[1] ppm (ww)[2] | Moderate Risk in Diet 0.05 – < 0.15 mHg[1] ppm (ww)[2] | High Risk in Diet 0.15 – 0.3 mHg[1] ppm (ww)[2] | Extra High Risk in Diet >0.3 mHg[1] ppm (ww)[2] | References |
|---|---|---|---|---|---|---|---|
| | | | Cysts/Napulii | Adults | | | |
| Brine Shrimp | June – December 2008 | DWR3 12.8 km NNW of Hat Island | 0.0062 tHg geomean<br>0.0018 to 0.0014 tHg range (n=10) | 0.0505 tHg geomean<br>0.0192 to 0.0863 tHg range (n=10) | | | RGI Grant |
| | June, July, Aug, Oct, Nov 2008 | GSL Streak 1 - cysts | 0.0091 tHG geomean<br>0.006 to 0.0126 tHg range (n=7) | | | | |
| | June – Oct 2008 | GSL Streak 2- cysts | 0.0092 tHg geomean<br>0.006 to 0.0116 tHg range (n=9) | | | | |
| | June, Sept, Oct 2008 | GSL Streak 3- cysts | 0.0089 tHg geomean<br>0.0052 to 0.0123 tHg range (n=5) | | | | |
| | Nov 2008 | GSL USU2 | 0.0117 tHg geomean | | | | |

**GSL Diet Data Comparison with Evers Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | Low Risk in Diet < 0.05 mHg[1] ppm (ww)[2] | Moderate Risk in Diet 0.05 – < 0.15 mHg[1] ppm (ww)[2] | High Risk in Diet 0.15 – 0.3 mHg[1] ppm (ww)[2] | Extra High Risk in Diet >0.3 mHg[1] ppm (ww)[2] | References |
|---|---|---|---|---|---|---|---|
| | | | 0.0108 to 0.0863 tHg range (n=2) | | | | |
| | | | Cysts/Napulii | Adults | | | |
| | June – December 2008 | GSL 2267 1 mi NW of Fremont Island– | 0.0088 tHg geomean<br>0.0059 to 0.0162 tHg range (n=10) | 0.0582 tHg geomean<br>0.0528 to 0.0694 tHg range (n=10) | | | |
| | | | Cysts/Napulii | Adults | | | |
| | June – December 2008 | GSL 2767 4 mi W of North Tip Antelope Island– | 0.0066 tHg geomean<br>0.0047 to 0.0080 tHg range (n=10) | 0.0577 tHg geomean<br>0.0252 to 0.0767 tHg range (n=10) | | | |
| | | | Cysts/Napulii | Adults | | | |
| | June – December 2008 | GSL 2935 W of Carrington Island– | 0.0068 tHg geomean<br>0.0042 to 0.0099 tHg range (n=10) | 0.0607 tHg geomean<br>0.0319 to 0.0976 tHg range (n=10) | | | |

**GSL Diet Data Comparison with Evers Risk Ranges for Hg**

| Organism | Date Sampled | Location Sampled | Low Risk in Diet < 0.05 mHg[1] ppm (ww)[2] | Moderate Risk in Diet 0.05 – < 0.15 mHg[1] ppm (ww)[2] | High Risk in Diet 0.15 – 0.3 mHg[1] ppm (ww)[2] | Extra High Risk in Diet >0.3 mHg[1] ppm (ww)[2] | References |
|---|---|---|---|---|---|---|---|
| | | | Cysts/Napulii | Adults | | | |
| | June – December 2008 | GSL 3510 8 mi West of Antelope Island– | 0.0047 tHg geomean<br>0.0017 to 0.0013 tHg range (n=10) | 0.0586 tHg geomean<br>0.0269 to 0.074 tHg range (n=10) | | | |
| | | | Cysts/Napulii | Adults | | | |
| | June – December 2008 | GSL 4069 8 mi West of Saltair Marina | 0.0078 tHg geomean<br>0.0050 to 0.00160 tHg range (n=10) | 0.0572 tHg geomean<br>0.0275 to 0.0724 tHg range (n=10) | | | |

# APPENDIX A-2

# DRAFT GREAT SALT LAKE ASSESSMENT FOR MERCURY

# PART 2 - 2010 ECOLOGICAL RISK ASSESSMENT APPROACH

## TABLE OF CONTENTS

# 1. INTRODUCTION

As described in USEPA (1998) *Guidelines for Ecological Risk Assessment*, an ecological risk assessment is a process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors. The process is used to systematically evaluate and organize data, information, assumptions, and uncertainties in order to help understand and predict the relationships between stressors and ecological effects in a way that is useful for environmental decision making.

For GSL, the assessment considers chemical stressors such as mercury. Ecological risk assessments are developed within a risk management context to evaluate human-induced changes that are considered undesirable. Changes often considered undesirable are those that alter important structural or functional characteristics or components of ecosystems. An evaluation of adverse effects may include a consideration of the type, intensity, and scale of the effects as well as the potential for recovery. The acceptability of adverse effects is determined by risk managers. Descriptions of the likelihood of adverse effects may range from qualitative judgments to quantitative probabilities. Although risk assessments may include quantitative risk estimates, quantitation of risks is not always possible. It is better to convey conclusions (and associated uncertainties) qualitatively than to ignore them because they are not easily understood or estimated.

Ecological risk assessments for GSL can be used to predict the likelihood of future adverse effects, e.g., a future discharge containing mercury, or evaluate the likelihood that effects are caused by past exposure to stressors, e.g., existing mercury concentrations in GSL are adversely affecting wildlife.

The ecological risk assessment process is based on two major elements: characterization of effects and characterization of exposure. These provide the focus for conducting the three phases of risk assessment: problem formulation, analysis, and risk characterization.

In problem formulation, the purpose for the assessment is articulated, the problem is defined, and a plan for analyzing and characterizing risk is determined. Initial work in problem formulation includes the integration of available information on sources, stressors, effects, and ecosystem and receptor characteristics. From this information two products are generated: assessment endpoints and conceptual models. Either product may be generated first (the order depends on the type of risk assessment), but both are needed to complete an analysis plan, the final product of problem formulation.

Analysis is directed by the products of problem formulation. During the analysis phase, data are evaluated to determine how exposure to stressors is likely to occur (characterization of exposure) and, given this exposure, the potential and type of ecological effects that can be expected (characterization of ecological effects). The first step in analysis is to determine the strengths and limitations of data on exposure, effects, and ecosystem and receptor characteristics. Data are then analyzed to characterize the nature of potential or actual exposure and the ecological responses under the circumstances defined in the conceptual model.

The products from these analyses are two profiles, one for exposure and one for stressor response. These products provide the basis for risk characterization. During risk characterization, the exposure and stressor-response profiles are integrated through the risk characterization process. Risk characterization includes a summary of assumptions, scientific uncertainties, and strengths and limitations of the analyses. The final product is a risk description in which the results of the integration are presented, including an interpretation of ecological adverse effects and descriptions of uncertainty and lines of evidence.

Although problem formulation, analysis, and risk characterization are presented sequentially, ecological risk assessments are frequently iterative. Something learned during analysis or risk characterization often leads to a reevaluation of problem formulation or new data collection and analysis.

# 2. PROBLEM FORMULATION

## 2.1 MANAGEMENT GOALS, OBJECTIVES, AND OPTIONS

*Management Goals* are statements about the desired condition of ecological values of concern (USEPA, 1998). The management goals driving this assessment come from DWQ rules. The management goals (R317-2-6) for GSL are in part[1] to maintain GSL water quality to support:

- Waterfowl, shore birds and other water-oriented wildlife including their necessary food chain in Gilbert Bay.
- Waterfowl, shore birds and other water-oriented wildlife including their necessary food chain in Gunnison Bay.
- Waterfowl, shore birds and other water-oriented wildlife including their necessary food chain in Bear River Bay.
- Waterfowl, shore birds and other water-oriented wildlife including their necessary food chain in Farmington Bay.
- Waterfowl, shore birds and other water-oriented wildlife including their necessary food chain in transitional waters.

If GSL does not support these uses, then GSL is impaired.

*Management Objectives* define what must be true in order for the management goals to be met and provide the foundation for management decisions. Mercury is the primary concern and the management objectives are to prevent toxic levels of mercury in water, sediment and biota for each of the geographic areas defined above.

*Management Options* determine the means to obtain the management goals and assist the ecological risk assessor with scoping the assessment. Management options relevant to DWQ to prevent toxic levels of mercury from accumulating in GSL include:

- No further action because mercury from GSL is not impairing the use.
- Implement voluntary actions to reduce mercury inputs to the lake or actions that would reduce mercury methylation rates.
- Implement the Total Maximum Daily Load (TMDL) process
    - Identify mercury sources to GSL.
    - Control mercury additions to the lake with UPDES permit limits.
    - Implement best management practices to control mercury inputs from nonpoint sources.
    - Implement controls to reduce methylation rates of mercury.
    - Physically remove mercury from the lake.

[1] The designated beneficial uses for GSL also include primary and secondary recreation.

## 2.2 ASSESSMENT ENDPOINTS

*Assessment endpoints* (USEPA, 1998) are explicit expressions of the actual environmental value that is to be protected, operationally defined by an ecological entity and its attributes. Assessment endpoints are critical to problem formulation because they structure the assessment to address management concerns and are central to conceptual model development.

Once ecological values are selected as potential assessment endpoints, they need to be operationally defined. Two elements are required to define an assessment endpoint. The first is the identification of the specific valued ecological entity. This can be a species (e.g., brine shrimp), a functional group of species (e.g., herbivorous waterfowl), a community (e.g., benthic invertebrates), an ecosystem (e.g., GSL), a specific valued habitat (e.g., wetlands), or other entity of concern. The second is the characteristic about the entity of concern that is important to protect and potentially at risk. Thus, it is necessary to define what is important for

brine shrimp (e.g., saline waters free of toxic contaminants), a lake (e.g., mercury cycling), or wetlands (e.g., food source free of toxic contaminants for waterfowl). For an assessment endpoint to serve as a clear interpretation of the management goals and the basis for measurement in the risk assessment, both an entity and an attribute are required.

The following assessment endpoints are proposed for GSL include:

- survival, growth, and reproduction of algae used by brine shrimp and brine flies,
- survival, growth, and reproduction of brine shrimp,
- survival, growth and reproduction or brine flies,
- survival, growth, and reproduction of waterfowl, and
- survival, growth, and reproduction of shorebirds.

The next step is to develop testable hypotheses. These hypotheses were selected based on the premise that mercury is toxic to these receptors and can affect survival, growth, or reproduction. Methyl mercury has been measured in GSL water, sediment, and biota. The hypotheses for this assessment are:

- Mercury present in GSL water, sediment, and biota is adversely affecting the survival, growth, or reproduction of brine shrimp.
- Mercury present in GSL water, sediment, and biota is adversely affecting the survival, growth, or reproduction of brine flies.
- Mercury present in GSL water, sediment, and biota is adversely affecting the survival, growth, or reproduction of waterfowl.
- Mercury present in GSL water, sediment, and biota is adversely affecting the survival, growth, or reproduction of shorebirds.

To conclude that GSL is impaired requires that only one of these entities be adversely affected by mercury from GSL.

## 2.3 SELECTING MEASURES

For the assessment plan described in the appendix included in the 2008 IR, we proposed to identify both *direct* and *indirect* indicators of the GSL ecosystem health. Thereby, multiple lines of evidence and measures were to be used to determine whether the beneficial uses are at risk. In this iteration, the same lines of evidence and measures are proposed but are put in the framework described by *Guidance for Conducting Ecological Risk Assessments* (USEPA, 1998). USEPA (1998) uses the *direct* and *indirect* terms in a similar way but in reference to effects. Direct and indirect effects from USEPA (1998) are easiest to define by example. A *direct effect* would be mercury reducing the

survival of brine shrimp. An *indirect effect* would be the reduced number of brine shrimp causing reduced growth in Eared Grebes who feed on brine shrimp.

There are three categories of measures (USEPA, 1998). Measures of effect are measurable changes in an attribute of an assessment endpoint or its surrogate in response to a stressor to which it is exposed. Measures of exposure are measures of stressor existence and movement in the environment and their contact or co-occurrence with the assessment endpoint. Measures of ecosystem and receptor characteristics are measures of ecosystem characteristics that influence the behavior and location of entities selected as the assessment endpoint, the distribution of a stressor, and life history characteristics of the assessment endpoint or its surrogate that may affect exposure or response to the stressor.

### 2.3.1 Algae

Measures of effects for algae potentially include observations of reduced populations, increases in nuisance algae, or bioassays where algae were exposed to mercury and survival, growth, or reproduction are measured. Mercury is known to adversely affect algae (Harriss et al., 1970) but most work has focused on the tendency of algae to accumulate mercury and be a source of exposure to higher trophic levels. Bioassays using algae species indigenous to GSL could be conducted. GSL algae populations are known to be significantly affected by grazing and salinity (Wurtsbaugh, 1995). GSL fluctuations of algal population due to mercury are unlikely to be detectable due to the fluctuations from these other factors.

Measures of exposure include measurements of methyl mercury in GSL water and sediment. No studies on the concentration of mercury in GSL algae were found but based on the mercury measurements from the water column and studies conducted elsewhere, GSL algae is expected to contain mercury. The algae complete their life cycle in GSL, so the source of any Hg is GSL.

Algae is an essential food source for higher trophic levels in GSL including brine shrimp and brine flies, although different types of algae are preferred by each. Brine shrimp graze primarily on phytoplankton. Brine flies graze on the periphyton and use bioherms (carbonates formed by blue-green algae) as a substrate for their chrysalis. Mercury concentrations can increase with trophic level, so the higher trophic levels may be a more sensitive indicator of adverse effects from mercury.

### 2.3.2 Brine Shrimp

Measures of effects for brine shrimp potentially include observations of reduced populations or bioassays where brine shrimp are exposed to mercury and survival, growth, or reproduction are measured. Pandey and MacRae (1991) measured a lowest-observed-adverse-effects-concentration (LOAEC) of 0.1 µM (≈ 0.2 mg/l) for several forms of organic mercury, the lowest concentration tested. Bioassays could be conducted using GSL water and brine shrimp. GSL brine shrimp populations are known to be significantly affected by season, the availability of algae, salinity, predation, and harvesting. Field observations of fluctuations in brine shrimp population due to mercury exposure are unlikely to be detectable due to the fluctuations from these other factors.

Measures of exposure include measurements of mercury in GSL water, phytoplankton, and brine shrimp. Brine shrimp complete their life cycle in GSL and methyl mercury has been detected in GSL water and mercury in brine shrimp confirming that the exposure pathway is complete. The term brine shrimp includes cysts, napulii, juvenile and adult brine shrimp that are different life stages from youngest to oldest, respectively. Brine shrimp are also an

important food source for many birds, so mercury concentrations in brine shrimp tissues will help elucidate threats to higher trophic levels.

### 2.3.3 Brine Flies

Measures of effects for brine flies potentially include observations of reduced populations or bioassays where brine flies are exposed to methyl mercury and survival, growth, or reproduction are measured. Bioassays are unavailable but could be conducted. Brine fly populations are known to be significantly affected by seasons, the availability of algae, predation, and salinity. Field observations of fluctuations of brine fly populations due to mercury exposure are unlikely to be detectable due to the fluctuations from these other factors. Other aquatic

invertebrates for which data is available may be suitable surrogates to extrapolate methyl mercury toxicity.

Measures of exposure include measurements of mercury in GSL brine flies, water, periphyton, and phytoplankton. Brine flies complete their life cycle at GSL and methyl mercury has been detected in GSL water and sediment and the exposure pathway is presumed to be complete. Brine flies are also an important source of food for birds and other animals that may be at a greater risk due to the previously noted tendency for mercury to bioaccumulate.

### 2.3.4 Waterfowl

Measures of effects for waterfowl potentially include observations of reduced populations or reproductive impairments, or studies where waterfowl are exposed to methyl mercury and survival, growth, or reproduction are measured.

Due to the migratory nature of waterfowl, field observations of variations in population would be difficult to conduct or interpret (http://wildlife.utah.gov/gsl/waterbirdsurvey/eagr.htm). Large die-offs periodically occur at GSL due to avian cholera that further complicates any field population studies (UDWR, 2010). A field study on GSL was conducted where Cinnamon Teal eggs were examined. No adverse effects were observed but the mercury concentrations in cinnamon teal eggs were generally below the literature benchmarks. USFWS (2009) measured mercury from 1996 to 2000 in Forster's terns and great blue heron eggs and chicks at Farmington Bay. No toxic effects were observed even though the concentrations for some individuals were higher than literature benchmark levels for frank (obvious) health effects in birds (Heinz 1974, Barr 1986, and Scheuhammer 1997).

Many field and laboratory studies have been conducted on the effects of mercury on waterfowl. Appendix A of the 2008 IR presents a mercury assessment logic diagram and decision rules to guide the collection and interpretation of benchmarks and data. In Part 1, Tables 2, 3, 4, and 5 of this assessment, research of mercury toxicity to aquatic birds including observed growth, survival, or reproduction, and the concentrations of mercury in diet, eggs, blood, and liver collected to date is presented. Evers et al. (2004) extensive research of mercury toxicity in Loons provided risk ranges for mercury concentrations in diet, eggs, and blood as a comparison. The applicability of these studies to GSL has not been evaluated in detail but will be prior to applying to GSL waterfowl.

GSL differs from many of the studies in the literature where methyl mercury toxicity was measured because of selenium co-occurring with mercury at GSL. Mercury and selenium can be antagonistic in avian species, i.e., less than additive toxicity (*e.g.*, El-Begearm et al. 1977; Heinz and Hoffman, 1998; Yang et al., 2008). The primary mechanism of antagonism is hypothesized to be the result of mercury and selenium binding in addition to other

mechanisms (Parizek, 1978; Yang et al., 2008). In contrast to the mercury:selenium antagonism observed in adult birds, Heinz and Hoffman (1998) conducted a controlled feeding study of methyl mercury and selenium effects on mallard duck eggs. The author's concluded that methyl mercury and selenium were more toxic to mallard duck embryos than either methyl mercury or selenium alone. In mammals, the form of selenium has been shown to be important for the degree of antagonism (Magos et al., 1978; Lemire and Mergler, 2009). At GSL, mercury and selenium are accumulated differently in avocets, goldeneyes, eared grebes, and seagulls (Santolo and Ohlendorf, 2008). These differences may reflect differing species-specific toxicokinetics or different exposure regimes.

A detailed review of the toxicological literature will be conducted as part of future efforts with the goal of deriving a no-observed-effects concentration to compare with the available tissue data.

Waterfowl are in the upper trophic levels for GSL and exposures are expected to be higher than at the lower trophic levels. GSL waterfowl feed on the available algae and invertebrates that include brine flies, brine shrimp, and coroxids in addition to potentially foraging in areas other than GSL. Some waterfowl, like eared grebes, feed predominantly on brine shrimp.

Measures of exposure include measurements of mercury in GSL waterfowl, water, sediment, algae, and invertebrates. Methyl mercury was detected in GSL water and brine shrimp that indicates the exposure pathway is complete for waterfowl feeding on brine shrimp or contacting GSL water. Concentrations of mercury measured in Common Goldeneye ducks from GSL are among the highest measured (Vest et al., 2008; USFWS, 2009). The concentrations of mercury in Common Goldeneye duck tissues increase from when the birds first arrive in the fall to winter further supporting that the exposure pathway at GSL is complete. Mercury concentrations subsequently decreased later in the season in Common Goldeneye ducks for reasons that are unclear.

The majority of waterfowl at GSL are residents for part of the year. Some species, like cinnamon teal nest at GSL. All of the waterfowl are mobile except when molting prevents flight, e.g., eared grebes. The portion of the mercury burden in waterfowl that is from the GSL is currently unknown. However, adverse effects from mercury have to be attributable to GSL exposures to make an impairment decision for GSL as identified in the management goals.

Several lines of evidence will be considered for evaluating what portion of the mercury exposures is attributable to GSL:

- Is the species a year-round resident or migratory?
- What is the composition of the diet and in what areas of GSL do they forage? What are the concentrations of mercury in waterfowl before and after they migrate?

The literature will also be reviewed for studies where the uptake and depuration rates of methyl mercury in waterfowl were measured. With applicable data, the portion of methyl mercury burden attributable to GSL can be modeled.

A comparison of the literature benchmarks (Part 1, Tables 2 through 5) with the mercury burdens in GSL waterfowl (Part 1, Tables 6 through 9) suggests that adverse effects from mercury exposures are possible and further investigation is warranted. Only one species needs to be adversely affected from GSL mercury exposures to support an impairment decision. However, more than one species may need to be evaluated because for instance, the species with the highest exposures may not be the species that are the most sensitive to methyl mercury's effects. Data gaps in either the measures of exposures or measures of effects may preclude basing an impairment conclusion on a single species.

### 2.3.5 Shorebirds

Measures of effects for shorebirds potentially include observations of reduced populations or reproductive impairments, or studies where shorebirds are exposed to methyl mercury and survival, growth, or reproduction are measured.

Due to the migratory nature of shorebirds, field observations at GSL of reductions in population would be difficult to conduct or interpret. A field study at GSL was conducted where herring gull colonies at GSL were compared to a reference site (Conover and Vest, 2008). Mercury and selenium were measured in muscle, liver, and eggs. The mercury concentrations measured in some individuals were higher than literature benchmark levels for frank (obvious) health effects in birds (Heinz 1974, Barr 1986, and Scheuhammer 1997). However, no reproductive effects were observed. One out of 73 eggs collected was not viable and 100 examined chicks appeared normal. However, Conover and Vest (2008) note that herring gulls may not be as sensitive to mercury as other shorebirds or waterfowl.

Many field and laboratory studies have been conducted on the effects of mercury on shorebirds. Appendix A of the 2008 IR presents a mercury assessment logic diagram and decision rules to guide the collection and interpretation of benchmarks and data. In Part 1, Tables 2, 3, 4, and 5 of this assessment, research of mercury toxicity to aquatic birds including observed growth, survival, or reproduction, and the concentrations of mercury in diet, eggs, blood, and liver collected to date is presented. Evers et al. (2004) extensive research of mercury toxicity in Loons provided risk ranges for mercury concentrations in diet, eggs, and blood as a comparison. The applicability of these studies to GSL has not been evaluated in detail but will be prior to applying to GSL shorebirds.

For the measures of effects, shorebirds are similar to waterfowl and the discussion in Section 2.3.4 applies to shorebirds and is not repeated here.

Shorebirds are in the upper trophic levels for GSL and exposures are expected to be higher than at the lower trophic levels. Shorebirds will feed on the available invertebrates that include brine flies, brine shrimp, and coroxids. Shorebirds may also significant exposures from incidental ingestion of contaminated sediment.

Measures of exposure include measurements of mercury in GSL shorebirds, water, sediment, and invertebrates. Mercury has been detected in all of these media confirming that the exposure pathway is likely complete. Limited data for mercury concentration in black-necked stilts, snowy plovers, great blue herons, Forster's tern, and American avocets are available (USFWS, 2009). In these studies, no obvious toxic effects were observed.

Shorebirds are mobile and may be migratory. The portion of the mercury burden measured in shorebirds that is from the GSL is currently unknown. However, for an impairment decision as identified in the management goals, adverse effects from mercury has to be attributable to GSL exposures.

Similar to the waterfowl discussed in Section 2.4.4, the same lines of evidence will be considered for evaluating what portion of the exposures to methyl mercury exposure is attributable to GSL.

A comparison of the literature benchmarks where mercury toxicity was observed with the mercury burdens in GSL shorebirds suggests that adverse effects are possible and further investigation is warranted. Only one species needs to be adversely affected from GSL mercury exposures to support a decision of an impairment decision. However, a single species may be inadequate. Species with the highest exposures may not be the same as the species that are the most sensitive to methyl mercury's effects. Data gaps in either the measures of exposures or measures of effects may preclude basing an impairment conclusion on a single species.

## 3. FUTURE EFFORTS

The management goal is to determine if GSL is impaired because of mercury. Short term efforts will focus on evaluating the data that is currently available that may or may not be sufficient for determining whether GSL is impaired. Short term efforts include:

- Develop a conceptual site model that is a graphical display of the movement of mercury through the ecosystem.
- Compile all available analytical data.
- Identify the most sensitive receptors. If the most sensitive receptors are protected, all of the receptors will be protected.
- Identify methods to identify the contribution of GSL to mercury burden of waterfowl and shorebirds.
- Evaluate literature benchmarks for applicability to GSL waterfowl and shorebirds if GSL is a significant source of mercury exposures.
- Refine measures of exposures and effects.
- Identify data gaps and any future research needs.

## 4. REFERENCES


Birds of North America Online, From the Cornell Lab of Ornithology and American Ornithologists Union. http://bna.birds.cornell.edu/bna

Birdnature. 2003. North American Migration Flyways. Available: http://www.birdnature.com/flyways.html.

El-Begearmi, M.M., M.L. Sunde, and H.E. Ganther. 1977. A mutual protective effect of mercury and selenium in Japanese quail. Poult Sci. 1977, Jan; 56(1):313-22.

Beyer et al. 1994 Estimates of Soil Ingestion by Wildlife. J Wildl. Manage. 8(2):375-382

Bird, H.R. Effect of selenium and mercury on survival of chick embryos. 1976. Poult Sci. Jul; 55(4):1423-8

Conover, M.R. and J.L. Vest. 2008. Selenium and Mercury Concentrations in California Gulls Breeding on the Great Salt Lake, Utah, USA. Environ. Tox. Chem.

EPA, 2003, EPA Wildlife Exposure Factors Handbook. EPA/600/R-93/187a, December 1993.

Gregus, Z., A. Gyurasics, I. Csanaky, and Z. Pinter. 2001. Effects of methylmercury and organic acid mercurials on the disposition of exogenous selenium in rats. Toxicol Appl Pharmacol. 2001, Jul 15; 174(2):177-87

Harriss, R.C., White, D., and MacFarlane, R. 1970. Mercury Compounds Reduce Photosynthesis in Plankton. Science. 170:736

Heinz, G.H. and D.J. Hoffman. 1998. Methylmercury chloride and selenomethionine interactions on health and reproduction in mallards. Environ Toxicol Chem 1998;17(2):139-45

Magos, L., T.W. Clarkson, S. Sparrow, and A.R. Hudson. 1987. Comparison of the protection given by selenite, selenomethionine and biological selenium against the renotoxicity of mercury. Arch Toxicol. 1987, Aug; 60(6):422-6

Parizek, J., I. Benes, I. Ostadalova, A. Babicky, and J. Benes. 1969

Metabolic interactions of trace elements. The effect of some inorganic and organic compounds of selenium on the metabolism of cadmium and mercury in the rat. Physiol. Bohemoslov.; 18(2): 95-103

Pandey, A.S., and T.H. MacRae. 1991. Toxicity of organic mercury compounds to the developing brine shrimp, Artemia. Ecotoxicol Environ Saf. Feb; 21(1):68-79

Santolo,G., and H. Ohlendorf. 2008. Technical Memorandum for Utah Division of Water Quality, Evaluation of Mercury Concentrations in Birds Collected from Great Salt Lake. April 7. http://www.deq.utah.gov/Issues/GSL_WQSC/docs/appendix/051408_Appendix_L.pdf

Utah Division of Wildlife Resources. Great Salt Lake Waterbird Survey, 1997-2001. http://wildlife.utah.gov/gsl/waterbirdsurvey/birds.htm

Utah Division of Wildlife Resources. 1999. Wildlife Notebook Series No. 6. Wilson's phalarope (*Phalaropus tricolor*). Available: http://www.wildlife.utah.gov/publications.

Utah Department of Natural Resources, Division of Wildlife Resources, Sensitive Species List, 2007.

Utah Division of Wildlife Resource (UDWR), 2010. Wildlife Disease in Utah Avian Cholera. Updated January 26, 2010. http://wildlife.utah.gov/diseases/avian_cholera.php

USEPA, 1998. Guidelines for Ecological Risk Assessment. EPA/630/R-95/002F

USEPA, 2009. Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, Final. January PA-823-R-09-002

Vest, J.L., M.R. Conover, C. Perschon, J. Luft, and J.O. Hall. 2009. Trace Element Concentrations in Wintering Waterfowl from Great Salt Lake. Arch. Environ. Contam. Toxicol. 56:302-316

Wurtsbaugh, W. 1995. Nutrient & Physical Factors Controlling Algal Production in the Great Salt Lake. March 15, 2005 presentation to the Great Salt Lake Steering Committee. http://www.deq.utah.gov/Issues/GSL_WQSC/docs/wdocs/Wayne.pdf

Yang, D.Y., Y.W. Chen, J.M. Gunn, and Nelson Belzile. 2008. Selenium and mercury in organisms: Interactions and mechanisms. Environ. Rev. 16:71-9

# APPENDIX B-1

# COMMENT RESPONSES

This section is reserved for comments and DWQ responses to the draft 2010 Integrated Report.