

Integrated Water Quality Monitoring and Assessment Report

State of Colorado

Prepared Pursuant to Section 303(d) and Section 305(b) of the Clean Water Act

2012 Update to the 2010 305(b) Report

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and Environment

Executive Summary

The Colorado 2012 Integrated Water Quality Monitoring and Assessment Report summarizes water quality conditions in the State of Colorado. This report fulfills Clean Water Act (CWA) Section 305(b) which requires all states to assess and report on the quality of waters within their State. This report fulfills Colorado's obligation under the Clean Water Act, and covers the 2010-2011 two-year period.

This report provides the State's assessments of water quality that were conducted during the past five years. Specifically, it compares the classified uses of all surface waters within the State to the corresponding standards in order to assess the degree to which waters are in attainment of those standards. The Integrated Report (IR) provides the attainment status of all surface waters according to the 5 reporting categories, defined in detail within. This report also includes a description of groundwater quality activity and links to agencies involved with groundwater monitoring.

The last full comprehensive report for Colorado was written in 2002. Biennial updates were provided for 2004, 2006, and 2008. A newly designed report was written for the 2010 submittal to provide a more useful, informative tool for the public and other state and federal agencies. This 2012 submittal is an updated version of the 2010 report.

2012 Report Highlights

- New wetlands section
- Summaries by basin changed from hydrologic basin to Water Quality Standards Basins
- New Aquatic Life MMI tool and listings
- Change from FCA (fish consumption advisories) to newly adopted methods
- More in-depth coverage of Water Quality Control Division's (WQCD) programs

From the highest sand dunes in North America to 54 mountain peaks over 14,000 feet, Colorado has one of the most unique and varied natural landscapes in the entire nation. Throughout the state, there exist lush green forests, fields of vibrant wildflowers, picturesque mountain lakes, abundant grasslands and rich red rock formations. There are many places to enjoy Colorado's vast natural beauty, with four national parks, five national monuments and 41 state parks waiting to be explored. Colorado is also home to 25 scenic and historic byways, noted for their distinct qualities. They include ghost towns, ancient ruins, alpine tundra, some of the oldest trains in the West and much more.



Oh Be Joyful Creek

What's Changed from the 2010 305(b) Report Update?

New Wetlands Section

- The WQCD contracted with the Colorado National Heritage Program to compile a section covering Colorado's wetlands.

Hg Listings

- 303(d) listings for fish tissue mercury are no longer linked to the issuance of an FCA. New assessment methods have been adopted for both 303(d) listing waterbodies as well as for issuing FCAs.

MMI Tool and Bioassessments

- First time use of the WQCC's approved Multimetric Index (MMI) tool.

Basin Summaries

- Reporting by basin is now summarized by WQCC standards basins, rather than hydrologic basins.

Greater Accuracy in Waterbody Sizes

- Great improvements in National Hydrography Dataset (NHD)/Geographical Information System (GIS) layers have improved the accuracy of waterbody sizes for Colorado.

Fun Fact: Antero is derived from the Spanish word "first", as it was the first dam on the South Platte River near the river's origin and first in storage capacity at the time of its construction. Built in 1909, the Antero Dam is an earth-filled dam. Green Lake lies submerged within the Antero Reservoir.



Events shaping Colorado's Water Quality for 2012 Integrated Reporting Cycle

Measureable Results Program

The Measureable Results Program (MRP) began in 2010 as a collaborative effort between the Division's Nonpoint Source Program, the Colorado Water Conservation Board's Watershed Restoration Program, and the Colorado Watershed Assembly. The MRP's main goal is to document the effects of restoration efforts taking place on Colorado's rivers and streams, as well as enhance monitoring data for restoration projects across the state.



MACROINVERTEBRATE SAMPLING

The MRP has worked to develop a toolbox of monitoring procedures and parameters that can be applied to systematically and quantitatively measure the changes to the chemical, biological, and physical attributes or river systems as a result of restoration practices.

Periodical resurveys of established sites will document the environmental impact benefits of the restoration activities over time. Projects are frequently evaluated on four levels: chemical, biological, physical and remote sensing.

Projects that were monitored in 2011 include:

- Rio Grande Restoration Project
- Alamosa River Restoration Project
- Eagle River Restoration Project
- Arkansas River at Hecla Junction
- Coal Creek Restoration Project
- Town of Alma Sediment Reduction Project

For more information, visit: <http://www.coloradowater.org/MeasureableResultsProgram>.

Fourmile Fire

Fourmile Canyon located west of the City of Boulder experienced a major wildfire in September of 2010, taking eleven days to reach full containment. Rehabilitation efforts were started, although results might be measured in decades, not years. The risk of severe erosion and the water quality impacts from mudslides is dependent on the slope of the ground and the severity of the burn. Firefighters gathered duff, leaves, branches and twigs, to spread over the bare earth, and on steep slopes, worked to create water bars, which divert water off the fire line, preventing erosion. The city of Boulder, the major water utility in the area, has stated that it does not have concerns about its drinking water, since its sources are mostly west and uphill of the fire. Even the Boulder Reservoir, which is

northeast and downhill of the fire, draws its water largely from across the Continental Divide via the Colorado-Big Thompson project.

With increased potential for flooding, debris flows and weed invasion in the Fourmile Canyon Fire area due to loss of vegetation and bare slopes, the Boulder County Fire Rehabilitation Implementation Team undertook a series of watershed-level treatments in the spring of 2011 aimed at reducing erosion and weeds in the areas hardest hit by the fire. Additional measures will be taken in the spring and summer of 2012 to continue to improve soils and create better erosion control in the burned areas. The State of Colorado is also making monies available to protect local drinking water supplies from runoff. The money for protection comes from the Water Quality Improvement Fund, which is supported by the collection of civil penalties for violations of the Water Quality Control Act.

High-Quality Water Supply Study

The WQCD's Standards Unit and Safe Drinking Water Program worked in partnership with nine local drinking water utilities and the University of Colorado on the High-Quality Water Supply Study (HQWS) to investigate the impact of algae growth in reservoirs on disinfection byproduct (DBP) formation at drinking water utilities. The data obtained was used to develop nutrient criteria for the State's reservoirs and lakes.

For the study, data was collected in two tiers. The first tier involved sampling 38 lakes in the summer of 2010. Ten of those lakes, the HQWS-intensive set, were sampled biweekly from May to October in order to investigate seasonal patterns in key water quality variables. These lakes generally contain high quality water and most deliver water directly to municipal treatment facilities. An additional 28 lakes, the HQWS-synoptic set, were sampled by the WQCD once in midsummer when temperatures in the mixed layer were near the summer maximum. These lakes represent a much broader range of water quality conditions than the ten HWQS-intensive lakes.

Samples were analyzed for algae speciation, chlorophyll a, total trihalomethane, and haloacetic acids formation, total and dissolved organic carbon, total nitrogen, total phosphorus, nitrate, nitrite, ammonia and ultraviolet absorbance. More information may be observed here:

http://www.cdphe.state.co.us/op/wqcc/Hearings/Rulemaking/31_85nutrients/PPHS/31_85pphsWQCD.pdf

Colorado River Basin Salinity Control Program

The Colorado Water Conservation Board (CWCB), in collaboration with CDPHE, represents the State of Colorado in the Colorado River Basin Salinity Control Program (CRBSCP). The CRBSCP is a cooperative effort of the seven Colorado River Basin states, the federal government and basin water users to limit increases in river salinity. The Program reduces salinity, preventing salts from dissolving and mixing with the river's flow. Irrigation improvements and vegetation management reduce water available to transport salts vertically, laterally and on the soil surface. Point sources, such as saline springs, also are controlled. The Program, a long-term interstate and interagency public/private partnership effort, is carried out to reduce the amount of salts in the river and its associated impacts in the basin.

The combined efforts of the Program have resulted in the control of an estimated 772,627 tons of salt per year. This salt reduction results in reduced damages of about \$88 million/year. Salinity Control Projects in Colorado include:

- Grand Valley Unit: Canal lining, piped laterals and on-farm irrigation improvements in the Grand Junction area, funded by U.S. Bureau of Reclamation (USBR) and Natural Resources Conservation Service (NRCS)
- Lower Gunnison Unit: Livestock winter water source replacement, piped laterals and on-farm irrigation improvements in the Montrose and Delta areas funded by USBR and NRCS
- Mancos Area: Piped laterals and on-farm irrigation improvements in the Mesa Verde area, funded by NRCS
- Montezuma Valley Unit: Canal lining, piped laterals and on-farm irrigation improvements in the Cortez area funded by USBR and NRCS
- Paradox Valley Unit: Saline groundwater interception and deep well disposal along the Dolores River near Bedrock, Colo., funded by USBR
- Additional NRCS study areas: Silt, Whitewater and Debeque

In conjunction with the removal of salts from the Colorado River basin, selenium is simultaneously removed. Reductions in selenium concentrations in the lower Colorado River have resulted in attainment of the chronic and acute selenium standards on the lower Colorado River from the Gunnison River to the Colorado-Utah state line. This portion of the river was first identified on the state's 303(d) List as impaired for selenium in 2004 and remains critical habitat for the endangered species, the Colorado pikeminnow and razorback sucker.



MONTROSE ARROYO, COLORADO

Assessment Efforts during 2010 and 2011

Surface water quality assessments over the past two years have focused on basin rulemaking hearings for the San Juan and Dolores River Basins (Regulation No. 34) and the Gunnison and Lower Dolores River Basins (regulation No. 35) which will be held in June of 2012. For 2010 and 2011, the Basic Standards Rulemaking Hearing took place. Other water quality assessments were also conducted during the preparation of the 2012 303(d) List as well as those associated with Colorado Discharge Permit System (CDPS) permits.

Colorado continues to make improvements to the Assessment Database (ADB) through a long term effort to migrate all their water quality standards, and associated information, to a computerized Geographic Information System (GIS). Throughout this refinement process, a number of issues were discovered regarding the segmentation and segment sizes, and therefore the number of river miles and lake acres reported in this document will differ from previously reported values. A vastly improved National Hydrography Dataset (NHD) GIS layer provided the Division with greater accuracy in waterbody sizes for the State of Colorado and has therefore provided percents attaining/non-attaining with a level of confidence.

For the current cycle, over 71,048 river miles and over 151,827 lake acres were assessed. For Colorado streams and rivers, over 49,309 miles were supporting all classified uses. Approximately, 9,670 miles were supporting at least one classified use, but approximately 9,548 miles were found to be impaired and require a Total Maximum Daily Load analysis (TMDL) to be developed.

For Colorado lakes, approximately 59,871 acres were found to fully support all classified uses. An additional 22,887 acres were supporting at least one classified use. A total of approximately 69,169 lake acres were found to be impaired and require a TMDL.

Surface Water Quality and Use Support

Surface water quality standards have been established to be protective of all uses. Waterbodies may be assigned any of five following categories of use classifications: aquatic life, recreation, water supply, wetlands or agriculture. One goal of the Clean Water Act (CWA) is that all waters of the state are classified and fully supporting "fishable" and "swimmable" use classifications. Past reports have combined these four classified use classifications into the older "fishable" and "swimmable" bigger categories. Beginning with the 2010 report, the IR will report all classified use attainment and all reporting categories.

Fun Fact: the Colorado-Big Thompson and Fryingpan-Arkansas projects divert water from the Western Slope, which contains two-thirds of the state's surface water, to the Eastern Slope. The Eastern Slope contains most of the state's population and farmland.



The five classified use reporting categories are as follows. Each assigned classified use will fit into one of these five categories. A more detailed description of the five categories, including subcategories is included within the report.

Category 1

- Attaining Water Quality Standards.

Category 2

- Attaining some classified uses.

Category 3

- Insufficient data to determine whether or not the classified uses are being attained.

Category 4

- Not supporting a standard for 1 or more classified uses, but a TMDL is not needed. (Subcategories further explained.)

Category 5

- Not meeting applicable water quality standards for one of more designated uses by one or more pollutants. (303(d) waterbodies.)

Miles/Acres Impaired - 303(d) List

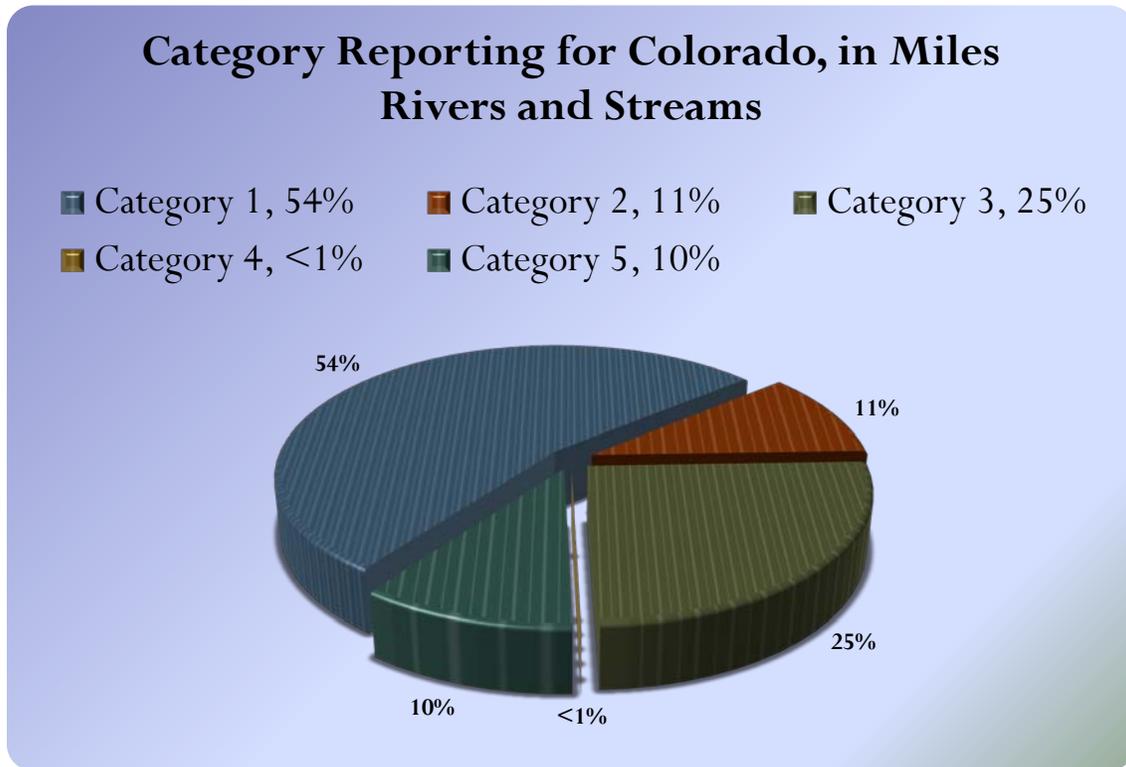
Stream segments that are not fully supporting their classified uses are defined as impaired and placed on the state 303(d) List of Impaired Waters. The 2012 Section 303(d) List identified over 178 impaired waterbodies, with approximately 292 individual pollutants on those segments requiring the development of TMDLs. This was an increase in the number of listed segments on the 2010 list, due mainly to changes in the 303(d) Listing Methodology, changes to table value standards in the Basic Standards, Regulation No. 31, and increased monitoring. The

Monitoring and Evaluation List also grew in 2012 with over 212 segments, with approximately 333 individual pollutants.

The 2012 303(d) List is submitted to EPA in April, 2012, as part of the submittal of the Integrated Report, which includes the 303(d) list and the 305(b) Report. The suspected causes and sources of the impairment, if known, have also been identified. For impaired waters, the leading cause of impairment is metals and more specifically, selenium in rivers and mercury in lakes. A natural source of selenium in Colorado is marine shales, while mercury airborne deposition is from diverse sources. The major source or contributor of these pollutants in Colorado is still unknown in most cases. Where the source of metals has been identified, it is mostly resource extraction.

Support Summaries for Rivers and Streams

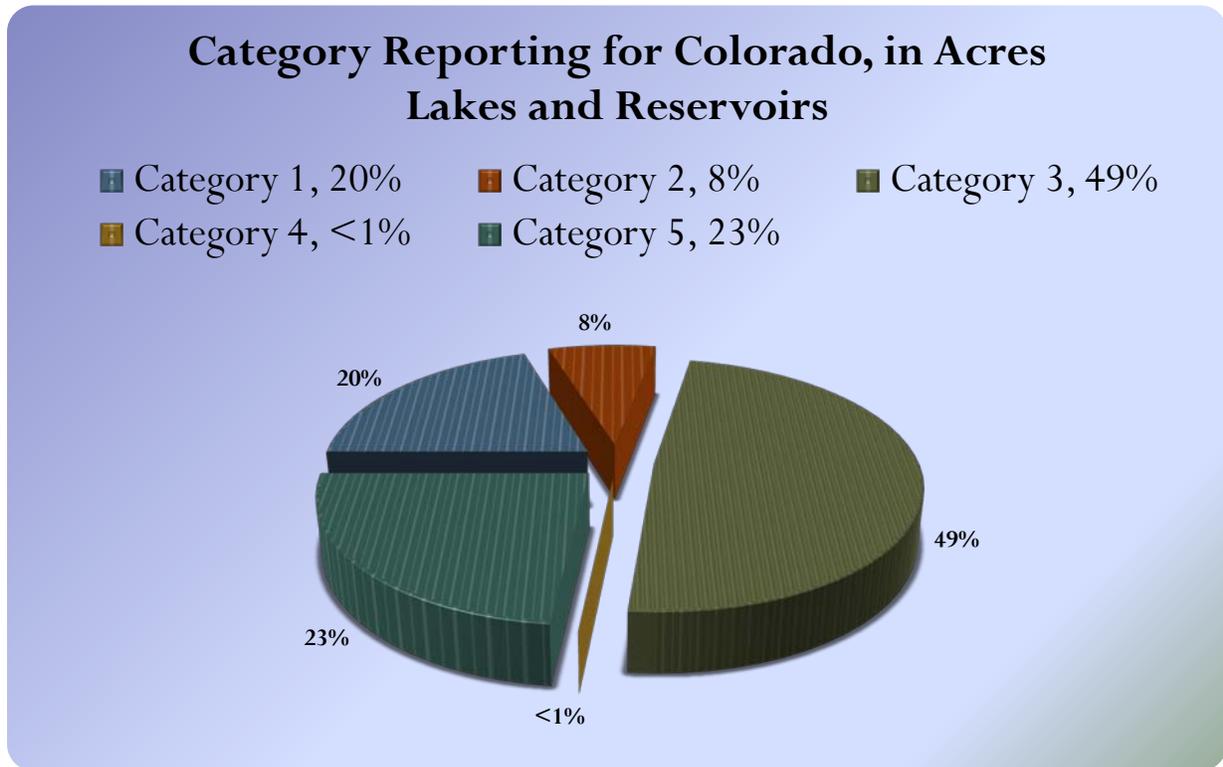
For the 2012 reporting cycle, the general category summaries are as follows. More detailed attainment graphs follow in the report.



River and Stream Category Summary		
<i>See page 5 for category explanations</i>		
Category	Size (Miles)	Number of Assessment Units
Category 1	49,309.06	364
Category 2	9,670.42	175
Category 3	22,950.73	162
Category 4a	2,518.86	64
Category 4b	2	1
Category 4c	0	0
Category 5	9,547.54	231

Support Summaries for Lakes and Reservoirs

For the 2012 reporting cycle, the general category summaries are as follows. More detailed attainment graphs follow in the report.

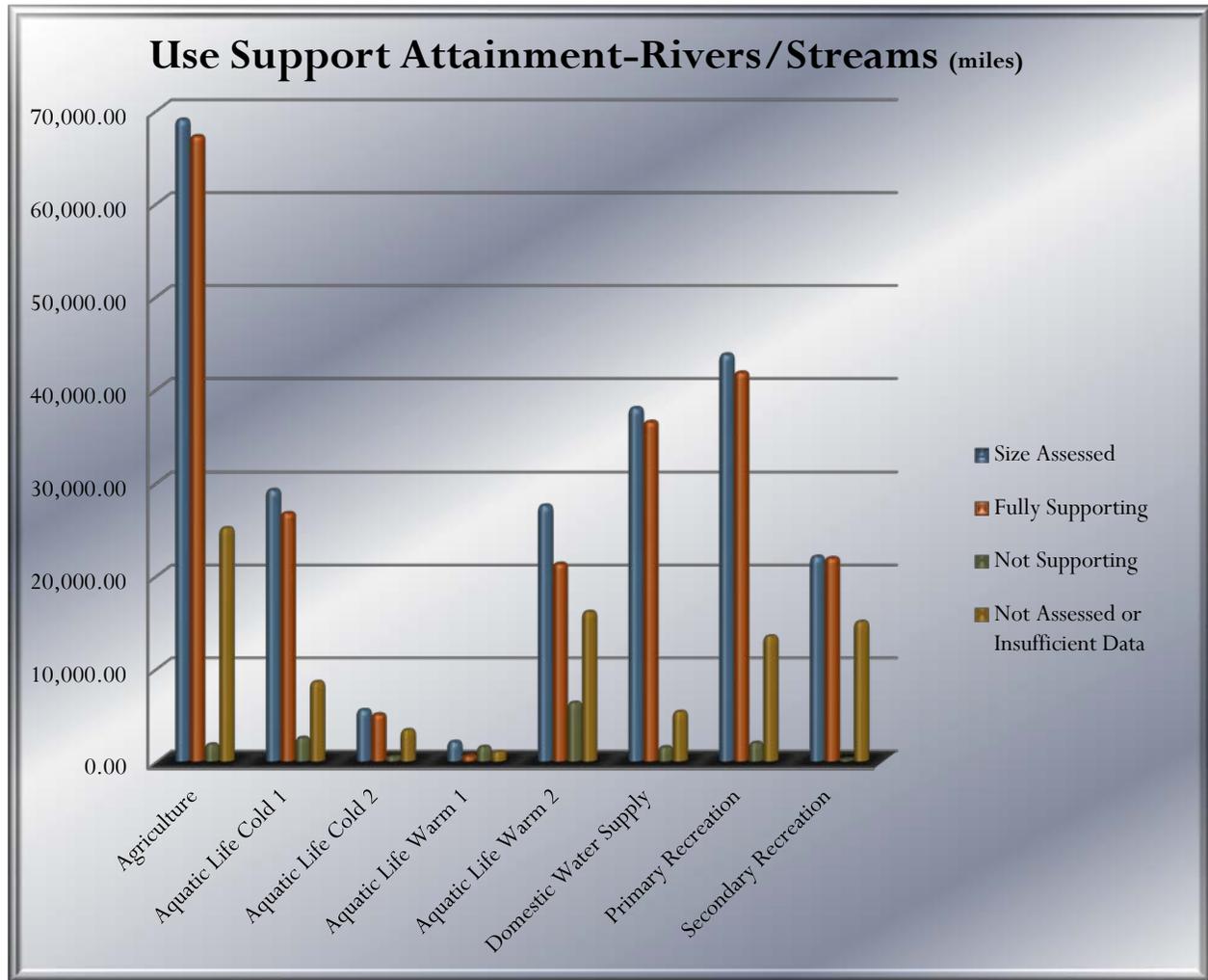


Lakes and Reservoirs Category Summary

See page 5 for category explanations

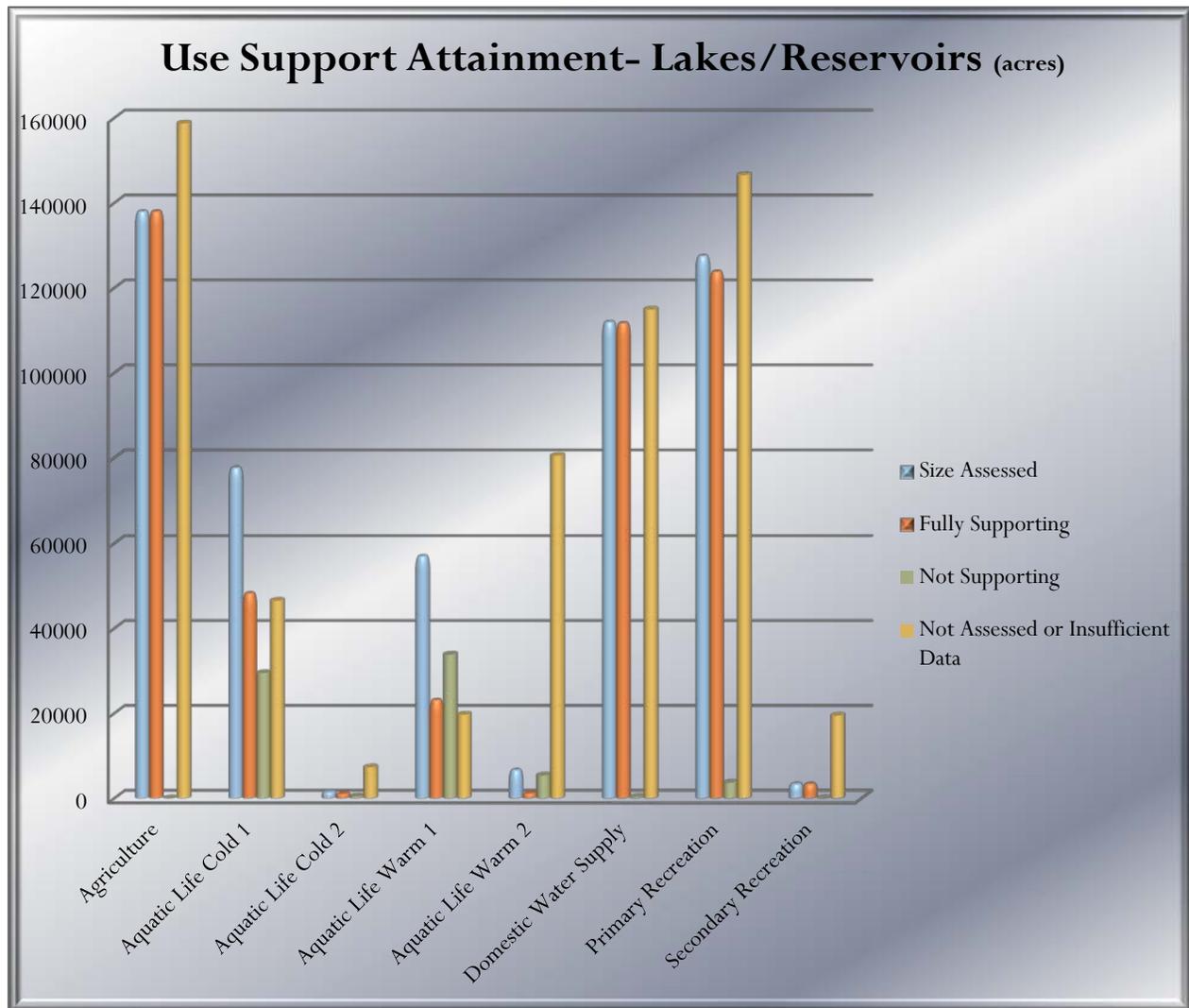
<i>Category</i>	<i>Size (Acres)</i>	<i>Number of Assessment Units</i>
Category 1	59,871.08	38
Category 2	22,887.19	32
Category 3	144,645.00	256
Category 4a	0	0
Category 4b	0	0
Category 4c	0	0
Category 5	69,169.19	61

Use support attainment, per assigned classified use for Rivers and Streams.



Classified Use	Size Assessed	Fully Supporting	Not Supporting	Insufficient Data
Agriculture	68,931.27	67,151.96	1,779.31	25,038.77
Aquatic Life Cold 1	29,150.41	26,666.38	2,484.03	8,492.13
Aquatic Life Cold 2	5,486.33	5,020.85	465.49	3,313.91
Aquatic Life Warm 1	2,058.85	548.925	1,509.93	976.41
Aquatic Life Warm 2	27,484.69	21,225.34	6,259.35	16,034.47
Domestic Water Supply	37,901.87	36,425.04	1,476.84	5,276.61
Primary Recreation	43,670.00	41,727.61	1,942.40	13,391.86
Secondary Recreation	21,974.09	21,825.16	148.94	14,962.66

Use support attainment, per assigned classified use for Lakes and Reservoirs.



Classified Use	Size Assessed	Fully Supporting	Not Supporting	Insufficient Data
Agriculture	137,847.3	137,847.3	0	158,705.4
Aquatic Life Cold 1	77,609.91	48,119.97	29,489.89	46,501.60
Aquatic Life Cold 2	1,475.8	1,027.5	448.3	7,296.84
Aquatic Life Warm 1	56,856.90	23,001.52	33,855.39	19,664.01
Aquatic Life Warm 2	6,504.35	1,128.74	5,375.61	80,492.45
Domestic Water Supply	111,825.6	111,535.1	290.6	114,889.2
Primary Recreation	127,340.51	123,668.8	3,671.79	146,526.99
Secondary Recreation	3,266.2	3,266.2	0	19,438.81

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LIST OF ACRONYMS

AAH – Administrative Action Hearing

ADB – Assessment Database

ARRA – American Recovery and Reinvestment Act

ASIWPCA - Association of State and Interstate Water Pollution Control Administrators

AWT - Advanced Wastewater Treatment

BAT - Best Available Technology

BMP - Best Management Practice

BPJ - Best Professional Judgment

BPT - Best Practicable Technology

CAFO - Confined Animal Feeding Operation

CCR - Colorado Code of Regulations

CDPHE - Colorado Department of Public Health and Environment

CDOT- Colorado Department of Transportation

CDPS - Colorado Discharge Permit System

CDNR – Colorado Division of Natural Resources

CEF- Core Elements Framework

CERCLA - Comprehensive Environmental Response, Compensation and Liability Act

CFR – Code of Federal Regulations

CLRMA – Colorado Lake Management Association

CMA - Colorado Mining Association

CNHP – Colorado Natural Heritage Program

COGCC – Colorado Oil and Gas Conservation Commission

CPW- Colorado Parks and Wildlife

CRBSCP- Colorado River Basin Salinity Control Program

- CSU- Colorado State University
- CWA - Clean Water Act
- CWC - Colorado Water Congress
- CWCB - Colorado Water Conservation Board
- DBP- Disinfection By-Product
- DCEED – Disease Control and Environmental Epidemiology Division
- DLG - Division of Local Government
- DOLA - Department of Local Affairs
- DOW - Division of Wildlife
- DRCOG - Denver Regional Council of Governments
- DRMS – Division of Reclamation, Mining and Safety
- DWSRF - Drinking Water State Revolving Fund
- EIA- Ecological Integrity Assessment
- EPA - Environmental Protection Agency
- FACWet- Functional Assessment of Colorado Wetlands
- FCA – Fish Consumption Advisory
- FERC – Federal Energy Regulatory Commission
- GC/MS - Gas Chromatography/Mass Spectrometry
- GIS – Geographic Information System
- IR – Integrated Report
- HGM- Hydrogeomorphic
- HMWMD - Hazardous Materials and Waste Management Division
- HCSFO - Housed Commercial Swine Feeding Operation
- HWQS- High Quality Water Study
- ICS – Incident Command System
- ISDS - Individual Sewage Disposal System

IRIS - Integrated Risk Information System

LA - Load Allocation

M&E – Monitoring and Evaluation List

MCL - Maximum Contaminant Level

MCLG - Maximum Contaminant Level Goal

MDL - Method Detection Limit

MGD – million gallons per day

mg/l - milligrams per liter

MMI – Multimetric Index

MRP- Measureable Results Program

MS4 – Municipal separate storm sewer system

NAIP- Nation Agricultural Imagery Program

NFRWQPA - North Front Range Water Quality Planning Association

NHD – National Hydrography Dataset

NIMS – National Incident Management System

NPDES - National Pollutant Discharge Elimination System

NPS – Nonpoint Source

NRCS- Natural Resources Conservation Service

NWCA- National Wetland Condition Assessment

NWI- National Wetlands Inventory

ORD- Office of Research and Development

PQL - Practical Quantization Limit

RCRA - Resource Conservation and Recovery Act

SARA - Superfund Amendments and Reauthorization Act

SEO - State Engineer’s Office

SDWA - Safe Drinking Water Act

SDWRF – State Drinking Water Revolving Fund

SIC - Standard Industrial Classification

SWAP - Source Water Assessment and Protection Program

TDS - Total Dissolved Solids

TMDL - Total Maximum Daily Load

TVS - Table Value Standards

TSI – Trophic State Index

µg/l - micrograms per liter

UIC - Underground Injection Control

UMTRA - Uranium Mill Tailings Remedial Action

USACE – United States Army Corps of Engineers

USBR- United State Bureau of Reclamation

USFWS- United States Fish and Wildlife Service

USGS – United States Geological Survey

UST - Underground Storage Tanks

VOC – Volatile Organic Compound

WBID – Water Body Identification

WET - Whole Effluent Toxicity

WHPA - Wellhead Protection Area

WLA - Wasteload Allocation

WPCSRF – Water Pollution Control State Revolving Funds

WPDG- Wetland Program Development Grant

WQC – Water Quality Certifications

WQCC - Water Quality Control Commission

WQCD - Water Quality Control Division

WQS – Water Quality Standards



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INTRODUCTION



Boulder Creek

A. Introduction

Colorado's 305(b) Component of the Integrated Report (IR)

This 305(b) Report is intended to comprehensively summarize the quality of State waters during 2010 and 2011. This characterization of water quality is the result of the ongoing assessment of all readily available and existing data collected from governmental, municipal, and private entities working throughout Colorado.

Colorado's 305(b) Reports have undergone many revisions in format over the years. Beginning in 2004, the State of Colorado elected to fulfill the reporting requirement by submitting comprehensive updates to earlier 305(b) Reports. In 2010, the report underwent an extensive revision in format and content. This 2012 report is an updated version of the 2010 report. The reporting requirements and explanation of Integrated Report is further described within this introduction.

Clean Water Act (CWA) Section 305(b) Reporting Requirements

The Federal Water Pollution Control Act (PL92-500, commonly known as the Clean Water Act (CWA)), as last reauthorized by the Water Quality Act of 1987 (PL100-4), establishes a process for States to use to develop information on the quality on the Nation's water resources. The requirements for this process are found in Sections 106(e), 204(a), 303(d), 305(b), and 314(a) of the CWA. Each State must develop a program to monitor the quality of its surface and groundwaters and prepare a report describing the status of its water quality. The Environmental Protection Agency (EPA) then compiles the data from the state reports, summarizes them, and transmits the summaries to Congress along with an analysis of the status of water quality nationwide.

<http://www.epa.gov/waters/ir/>

Section 305(b) of the CWA requires that each state submit a biennial report to the EPA. This 305(b) process is the principle means by which EPA, Congress, and the public evaluate whether U.S. waters meet water quality standards, the progress made in maintaining and restoring water quality, and the extent of remaining problems. Each 305(b) Report will contain at least the following:

- A description of the water quality of all waters in the state and the extent to which the quality of waters provides for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allows recreational activities in and on the water.
- An estimate of the extent to which CWA control programs have improved water quality or will improve water quality, and recommendations for future actions necessary and identifications of waters needing action.
- An estimate of the environmental, economic and social costs and benefits needed to achieve the objectives of the CWA and an estimate of the date of such achievement.
- A description of the nature and extent of nonpoint source pollution and recommendations of programs needed to control each category of nonpoint sources, including an estimate of implementation costs.
- An assessment of the water quality of all publicly owned lakes, including the status and trends of such water quality as specified in section 314(a)(1) of the CWA.

Clean Water Act (CWA) Section 303(d) Reporting Requirements

The 1972 amendments to the CWA include Section 303(d). The regulations implementing Section 303(d) require states to develop lists of waterbodies that do not meet water quality standards and to submit updated lists to the EPA every two years, along with the 305(b) Report. Water Quality Standards (WQS), as defined in the Code of Federal Regulations (CFR), include classified uses, water quality objectives (narrative and numerical) and anti-degradation requirements. The EPA is required to review impaired waterbody lists submitted by each state and approve or disapprove all or part of the list.

For waterbodies on the 303(d) list, the CWA requires that a pollutant load reduction assessment or Total Maximum Daily Load (TMDL) be developed to correct each impairment. TMDLs must document the nature of the water quality impairment, determine the maximum amount of a pollutant which can be discharged and still meet standards, and identify allowable loads from the contributing sources. The elements of a TMDL include a problem statement, description of the desired future condition (numerical target), pollution source analysis, load allocation, description of how allocations related to meeting targets, and margins of safety. <http://www.epa.gov/owow/tmdl/>

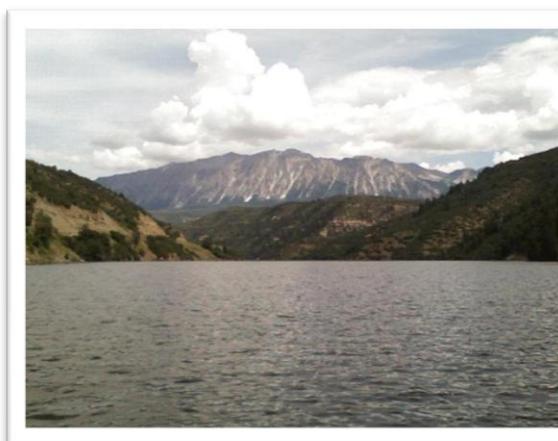
Each 303(d) list as incorporated into the Integrated Report (IR) contains the following information:

- A list of water quality-limited waters still requiring TMDLs, pollutants causing the impairment and priority ranking for TMDL development.
- A description of the methodology used to develop the list.
- A description of the data and information used to identify water, including a description of the existing and readily available data and information used.
- A rationale for any decision to not use any existing and readily available data and information.
- Any other reasonable information requested by EPA, such as demonstrating good cause for not including a water or waters on the list.

Clean Water Act (CWA) Section 314 Reporting Requirements

In each 305(b) Report submittal, an assessment of status and trends of significant publicly owned lakes including extent of point source and nonpoint source impacts due to toxics, conventional pollutants, and acidification is required. States must submit the following information in their 305(b) Reports:

- An identification and classification according to eutrophic condition of all publicly owned lakes.
- A description of procedures, processes, and methods (including land use requirements), to control sources of pollution of such lakes.
- A description of methods and procedures, in conjunction with



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appropriate federal agencies, to restore the quality of such lakes.

- Methods and procedures to mitigate the harmful effects of high acidity, including innovative methods of neutralizing and restoring buffering capacity of lakes and methods of removing from lakes toxic metals and other toxic substances mobilized by high acidity.
- A list and description of those publicly owned lakes in such state for which uses are known to be impaired, including those lakes which are known not to meet applicable water quality standards or which require implementation of control programs
- Plans to maintain compliance with applicable standards and those lakes in which water quality has deteriorated as a result of high acidity that may reasonably be due to acid deposition.
- An assessment of the status and trends of water quality in lakes in such state, including but not limited to, the nature and extent of pollution loading from point and nonpoint sources and the extent to which the use of lakes is impaired as a result of such pollution, particularly with respect to toxic pollution.

Integrated Reporting Guidance

The EPA has issued guidance for the development of an Integrated Water Quality Monitoring and Assessment Report (Integrated Report (IR)) by the States. This guidance requires that States integrate their Water Quality Inventory Report (305(b) Report) and their Impaired Waterbodies List (303(d) list), along with an electronic copy of the 305(b) database, the Assessment Database (ADB) and a copy of the State's National Hydrography Dataset (NHD). These four components make up the IR. The IR is intended to provide an effective tool for maintaining high quality waters and improving the quality of waters that do not attain water quality standards. The integrated report will also provide water resources managers and citizens with detailed information regarding the following:

- Progress towards achieving comprehensive assessment of all waters.
- Water quality standards attainment status.
- Methods used to assess water quality standards attainment status.
- Additional monitoring needs and schedules.
- Pollutants and waterbodies requiring TMDLs
- Pollutants and waterbodies requiring alternative pollution control measures.
- Management strategies (including TMDLs) under development to attain water quality standards.
- TMDL development schedules.

This IR will streamline water quality reporting since data sources and assessment methods will be described in detail in Colorado's Section 303(d) Listing Methodology (LM), which provides a sound technical and scientific basis for assessment and listing decisions. Public participation events provide opportunities for data submittal and discussion of water quality assessments methods and results. The LM is reviewed and updated on a biennial basis in anticipation of the IR development. The LM is revisited and revised with the intent of clarifying the Division's procedures for assessing attainment of those uses and standards assigned by the Commission to Colorado waters. The current LM can be found here at [http://www.cdphe.state.co.us/op/wqcc/Reports/303\(d\)/303d_LM2012.pdf](http://www.cdphe.state.co.us/op/wqcc/Reports/303(d)/303d_LM2012.pdf).

Fun Fact: Only 371 square miles of Colorado are covered by water in the form of lakes and reservoirs.



Integrated Reporting Categories

Waterbodies are assessed and divided into one of 5 reporting categories. Detailed descriptions are included below.

Category 1	• Attaining Water Quality Standards.
Category 2	• Attaining some classified uses. Includes M&E Category.
Category 3	• Insufficient data to determine whether or not the classified uses are being attained.
Category 4	• Not supporting a standard for 1 or more classified uses, but a TMDL is not needed. (Subcategories further explained.)
Category 5	• Not meeting applicable water quality standards for one of more designated uses by one or more pollutants. (303(d) waterbodies.)

Category 1: All classified uses are supported; no use is threatened.

Waterbodies in this category are consistent with their water quality standards and their assessment methodologies, and sufficient data and information exist to determine that all applicable water quality standards are being attained.

Category 2: Available data and/or information indicate that some but not all of the classified uses are supported.

Waterbodies in this category are characterized by data and information which meet the requirements to support a determination that some, but not all, uses are attained. Attainment status of the remaining uses is unknown because there is insufficient data or information available.

An example of a Category 2 would be a segment where the aquatic life and agriculture uses were both assessed and both attaining but *E. coli* data was lacking in order to assess the recreation use. In this case it is not known if the Recreation Use is being attained so it cannot be placed in Category 1.

Category 3: There is insufficient available data and/or information to make a use support determination.

Waterbodies in this category are listed as having insufficient data or information to support an attainment determination for any classified use. Assessment of the attainment status requires supplementary data and monitoring as needed and prioritized.

Colorado identifies waterbodies where some data is available that indicates that there may be an impairment but there is not enough data to put it on the 303(d) List. This list is called the Monitoring and Evaluation List (M&E List). Segments are placed on this list until additional data can be collected to either add it to the 303(d) List (Category 5) or place it into Category 1. Colorado places segments on the M&E List into Category 2. Segments where no water quality data has been collected are also placed in Category 3.

Category 4: Available data and/or information indicate that at least one classified use is not being supported or is threatened, but a TMDL is not needed.

Segments are placed in category 4 if available data and/or information indicate that at least one classified use is not being supported or is threatened, but a TMDL is not needed. Category 4 is further broken out into 3 additional sub-categories:

4A – TMDL HAS BEEN COMPLETED.

A state-developed TMDL has been approved by EPA or a TMDL has been established by EPA for any segment-pollutant combination. The waterbody is expected to result in full attainment of the standard once implementation of the TMDL is complete. Where more than one pollutant is associated with the impairment of a waterbody, the waterbody will remain in category 5 until all TMDLs for each pollutant have been completed and approved by EPA. Monitoring shall be scheduled for these waterbodies to verify that the water quality standard is met when the TMDL is implemented.

4B – OTHER POLLUTION CONTROL REQUIREMENTS ARE REASONABLY EXPECTED TO RESULT IN THE ATTAINMENT OF THE WATER QUALITY STANDARD IN THE NEAR FUTURE.

Alternative pollution control requirements may obviate the need for a TMDL. Segments are not required to be included on the Section 303(d) list if technology-based effluent limitations required by the Act, more stringent effluent limitations required by state, local, or federal authority, or “other pollution control requirements (e.g., best management practices) required by local, State or Federal authority” are stringent enough to implement applicable water quality standards (see 40 CFR 130.7(b)(1)) within a reasonable period of time. The most effective method for achieving water quality standards for some water quality impaired segments may be through controls developed and implemented without TMDLs (referred to as a “4b alternative”). Monitoring shall be scheduled for these waterbodies to verify that the water quality standard is attained as expected.

4C – IMPAIRMENT IS NOT CAUSED BY A POLLUTANT.

The non-attainment of any applicable water quality standard for the segment is the result of pollution and is not caused by a pollutant. These segments do not require the development of a TMDL. Pollution, as defined by the CWA is “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water” (section 502(19)). In some cases, the pollution is caused by the presence of a pollutant and a TMDL is required. In other cases, pollution does not result from a pollutant and a TMDL is not required. States should schedule these segments for monitoring to confirm that there continues to be no pollutant associated with the failure to meet the water quality standard and to support water quality management actions necessary to address the cause(s)

of the impairment. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow or to stream channelization.

Category 5: Available data and/or information indicate that at least one classified use is not being supported or is threatened, and a TMDL is needed.

Segments must be placed in Category 5 when, based on existing and readily available data and/or information, technology-based effluent limitations required by the Act, more stringent effluent limitations, and other pollution control requirements are not sufficient to implement an applicable water quality standard and a TMDL is needed. This category constitutes the Section 303(d) list of waters impaired by a pollutant. When more than one pollutant is associated with the impairment of a single waterbody, the waterbody will remain in category 5 until TMDLs for all pollutants have been completed and approved by EPA. Monitoring schedules shall be established for data collection to support TMDL establishment and to determine if the standard is attained. A schedule for the establishment of TMDLs for all waters in category 5 shall be submitted as well, and this schedule reflects the priority ranking of the listed waters.

Delisting Tables

In an effort to report progress of Clean Water Act programs, including progress in restoring waters, EPA strongly encourages States to document the status of segments that have been removed from Category 5 (303(d) listed streams). In order to provide a complete picture of restoration, States are also asked to capture the reasons for moving waters in Categories 4a, 4b, and 4c to other categories. This is now captured in a waterbody delisting table, which is now a permanent component of the 305(b) Report. Below is the list of reasons for moving waterbodies off of the 303(d) list.

- State determines water quality standard is being met
- TMDL alternative (4b)
- Non-attainment not caused by a pollutant (4c)
- TMDL approved or established by EPA (4a)
- Waterbody not in State's jurisdiction
- Applicable water quality standard attained due to restoration activities
- Applicable water quality standard attained due to changes in standards
- Applicable water quality standard attained according to new assessment method
- Applicable water quality standard attained; the reason for recovery is unspecified
- Applicable water quality standard attained; the original basis for listing was incorrect
- Data and/or information is lacking to determine water quality status; original basis for listing was incorrect (Category 3)

The delisting table for 2012 is included in Appendix C.

Public Participation Process

Colorado has a unique public participation process for the 305(b) portion of the IR. In addition to the public participation process in place for the LM and the 303(d) list, a process is also in place for the report. The draft 305(b) Report is posted on the Water Quality Control Commission (WQCC) website and public comments are encouraged. The WQCC will hold an Administrative Action Hearing (AAH) in March of every reporting year. Any public comments received will be considered and public participation is encouraged at the AAH. The WQCC will either approve or disapprove the report upon the conclusion of the AAH. The majority of the states do not have a public participation process for the 305(b) portion of the IR, thus making Colorado's process unique, informative and involved.



AERIAL FISH STOCKING

Background and Use Support Summary

B1. Colorado Background

This section provides a statewide overview of Colorado's surface water and a summary of the status of water quality. Assessment information about individual basins is provided in Section D. The individual segment assessments are listed in Appendices A and B: Classified Use Support Summaries for Rivers and Lakes.

Within Colorado's borders can be found over 105,344 river miles and more than 249,787 lake acres. The majority of Colorado's rivers originate in the pristine high alpine environment of the Rocky Mountains and flow downstream through the high desert or high plains regions before leaving the state. Within the interior of the Rocky Mountains are several high broad basins. In the north, on the east side of the Continental Divide is North Park. North Park is drained by the North Platte River, which flows north into Wyoming. Just south and west of the Continental Divide is Middle Park, drained by the Colorado River. South Park is the headwaters of the South Platte River. To the south lies the San Luis Valley, the headwaters of the Rio Grande, which drains into New Mexico. Across the Sangre de Cristo Range to the east of the San Luis Valley lies the Wet Mountain Valley. The Western Slope is generally drained by the Colorado River and its tributaries.

Nearly half of the state is flat in contrast to Colorado's rugged Rocky Mountains. East of the Southern Rocky Mountains are the Colorado High Plains, the section of the Great Plains within Colorado. The plains are sparsely populated with most population existing along the South Platte and Arkansas Rivers.

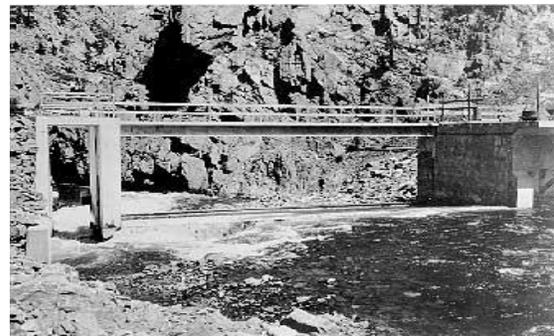
Fun Fact: The world's largest natural hot springs pool is located in Glenwood Springs and was a favorite stop of President Teddy Roosevelt.



Numerous dams and reclamation projects on the rivers provide water for irrigation and municipal and industrial use, as well as supply hydroelectric power. The Colorado-Big Thompson and the Fryingpan-Arkansas projects are two of the largest, and divert water from the Western Slope, which has two-thirds of the state's surface

water, to the Eastern Slope, where most of the population and farmland are concentrated.

There are seven major river basins in Colorado: the Arkansas, Rio Grande, San Juan, Colorado, Green, Platte and Republican. The largest of these basins on a national level is the Colorado River Basin, which has its headwaters in Rocky Mountain National Park, flows from Colorado through Utah and the Grand Canyon in Arizona, and ultimately completes its journey at the Gulf of California. The WQCC further divides these river basins into seven water quality standard regulated basins. Each of these are covered in more detail in Section C of this report.



BIG THOMPSON DAM, PHOTO BY USBR

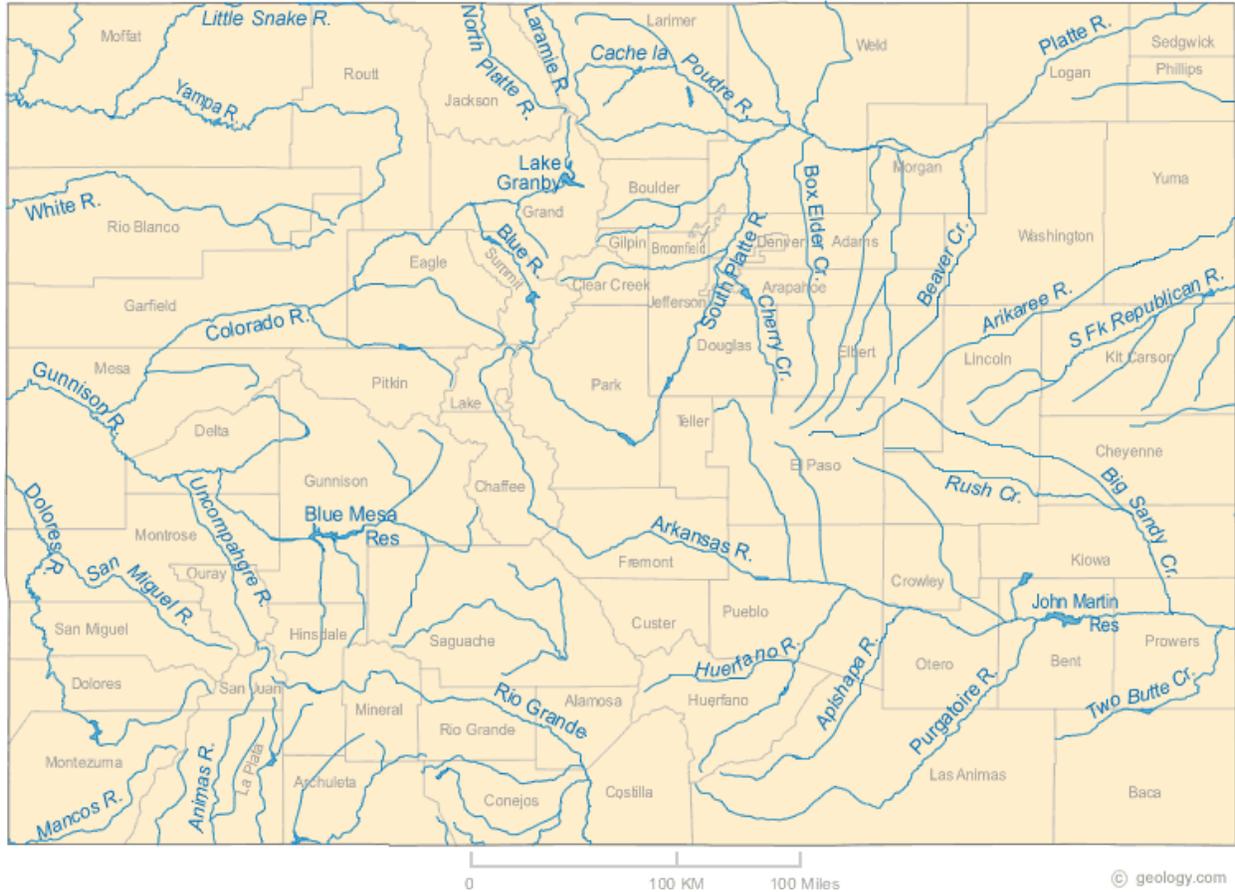


Figure 1: This map from <http://geology.com> shows the major streams and rivers of Colorado. Colorado has a total of 104,100 square miles of surface area, with only 371 of those square miles covered by water.

B1a. Colorado Use Support Summary

Summary of Classified Uses

The State of Colorado has adopted five different categories of classified waterbody uses: aquatic life, water supply, recreation, wetlands and agriculture. Table 2, Summary of Classified Uses, breaks down the number of stream miles and lake acres in the state that have been assigned each of these classified uses. Many segments support multiple uses.

Summary of Degree of Use Support

Colorado's water quality is assessed periodically in conjunction with the triennial review of water quality standards, the development of discharge permits, 303(d) Lists, Total Maximum Daily Loads (TMDLs), and the completion of

special studies. The following table summarizes the number of assessed stream miles and lake acres with their assigned classified uses.

Table 1: Summary of Classified Uses

(estimates of river miles and lake acres)

Classified Use	River Miles	Lake Acres
Aquatic Life Cold 1	37,643	124,112
Aquatic Life Warm 1	3,035	76,521
Aquatic Life Cold 2	8,800	8,773
Aquatic Life Warm 2	43,519	86,997
Recreation Primary Contact (Recreation Class E and P)	57,062	273,868
Recreation Secondary Contact (Recreation Class U and N)	36,937	22,705
Water Supply	43,178	226,715
Agriculture	93,970	296,553

Fun Fact: The deepest natural lake in Colorado is Grand Lake at 265 feet deep.



Summary of Waterbodies Meeting Classified Uses

The CWA at Section 101(a)(2) requires that all waters be suitable for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water unless it is demonstrated that the use is not attainable. Classified use classifications are assigned to waterbodies based upon the actual uses occurring in the waterbody. Water quality standards are in place to ensure that the waterbody is attaining the classified uses assigned. The following tables summarize the number of assessed stream miles and lake acres that have been assessed which do or do not support their assigned classified uses.

Table 2: Use support attainment, per assigned classified use for Rivers and Streams. (In miles)

Classified Use	Size Assessed	Fully Supporting	Not Supporting	Insufficient Data or Not Assessed
Agriculture	68,931.27	67,151.96	1,779.31	25,038.77
Aquatic Life Cold 1	29,150.41	26,666.38	2,484.03	8,492.13
Aquatic Life Cold 2	5,486.33	5,020.85	465.48	3,313.90
Aquatic Life Warm 1	2,058.85	548.93	1,509.93	976.41
Aquatic Life Warm 2	27,484.69	21,225.34	6,259.35	16,034.46
Domestic Water Supply	37,901.87	36,425.04	1,476.84	5,276.61
Primary Recreation	43,670.00	41,727.61	1,942.39	13,391.86
Secondary Recreation	21,974.09	21,825.16	148.94	14,962.66

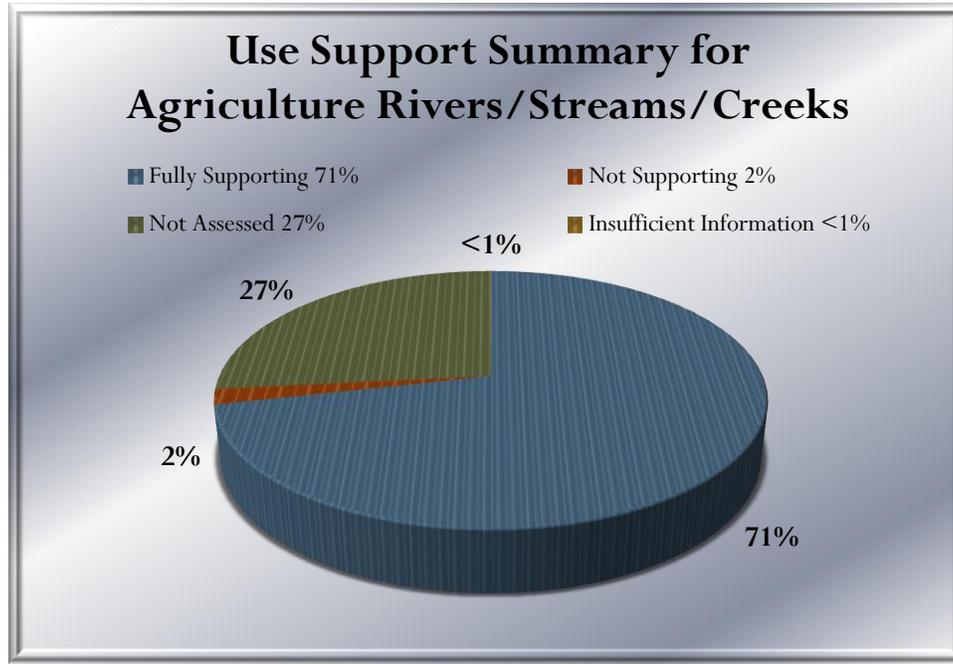
Table 3: Use support attainment, per assigned classified use for Lakes and Reservoirs. (In acres)

Classified Use	Size Assessed	Fully Supporting	Not Supporting	Insufficient Data or Not Assessed
Agriculture	137,847.3	13,7847.3	0	158,705.4
Aquatic Life Cold 1	77,609.90	48,119.97	29,489.89	46,501.60
Aquatic Life Cold 2	1,475.8	1,027.5	448.3	7,296.84
Aquatic Life Warm 1	56,856.90	23,001.52	33,855.39	19,664.01
Aquatic Life Warm 2	6,504.35	1,128.74	5,375.61	80,492.45
Domestic Water Supply	111,825.6	111,535.1	290.6	114,889.2
Primary Recreation	127,340.51	123,668.8	3,671.79	146,526.99
Secondary Recreation	3,266.2	3,266.2	0	19,438.81

Detailed Summaries of Waterbodies Meeting Classified Uses

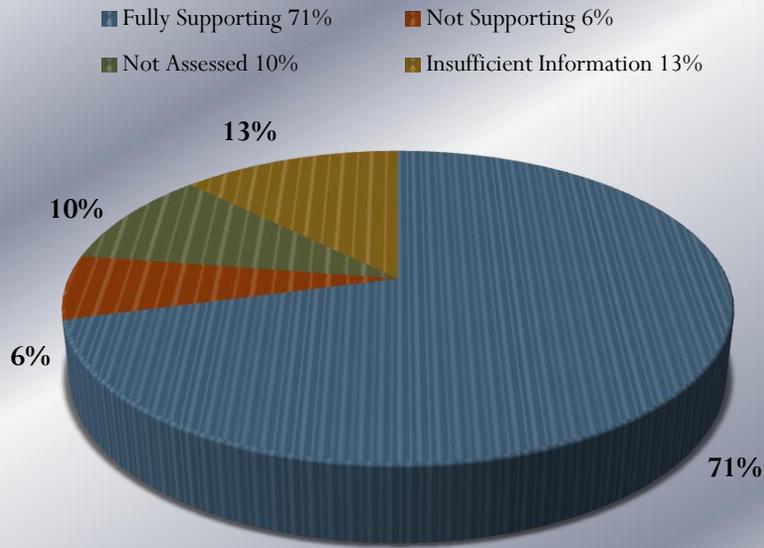
Beginning with the 2010 305(b) Report, the use support summaries for the various classified uses are reported in graphic detail. The following graphs are the result of the monitoring and assessments efforts for 2012.

For Rivers and Streams:



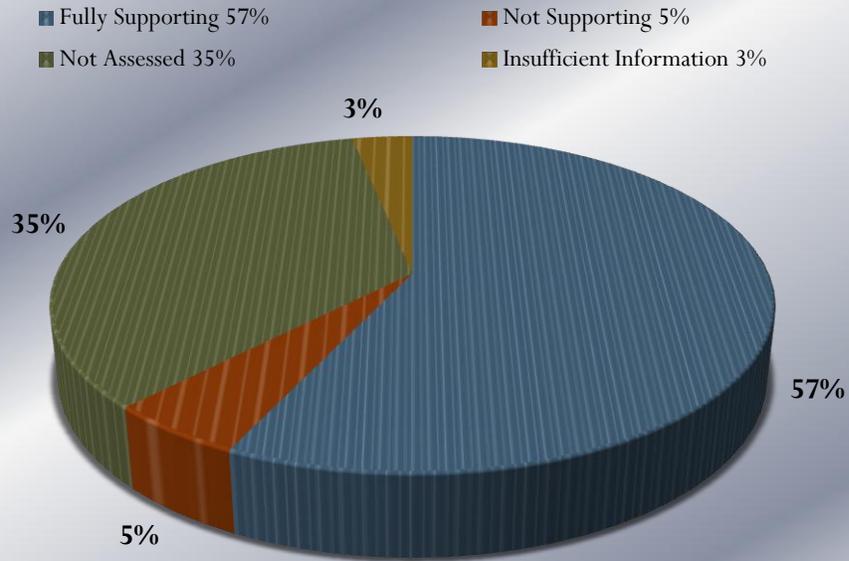
Degree of Use Support	Use Support Summary for Agriculture, in miles
	Rivers/Streams/Creeks
Fully Supporting	67,151.96
Not Supporting	1,779.31
Not Assessed	24,963.07
Insufficient Information	75.7

Use Support Summary for Aquatic Life, Cold 1 Rivers/Streams/Creeks



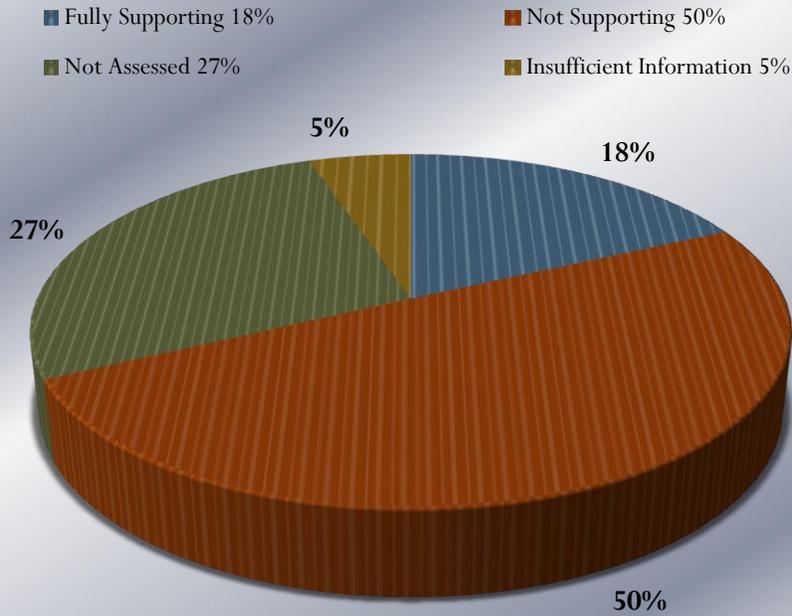
Degree of Use Support	Use Support Summary for Aquatic Life, Cold 1, in miles
	Rivers/Streams/Creeks
Fully Supporting	26,666.38
Not Supporting	2,484.03
Not Assessed	3,733.01
Insufficient Information	4,759.12

Use Support Summary for Aquatic Life, Cold 2 Rivers/Streams/Creeks



Degree of Use Support	Use Support Summary for Aquatic Life, Cold 2, in miles
	Rivers/Streams/Creeks
Fully Supporting	5,020.85
Not Supporting	465.4813
Not Assessed	3,031.98
Insufficient Information	281.9241

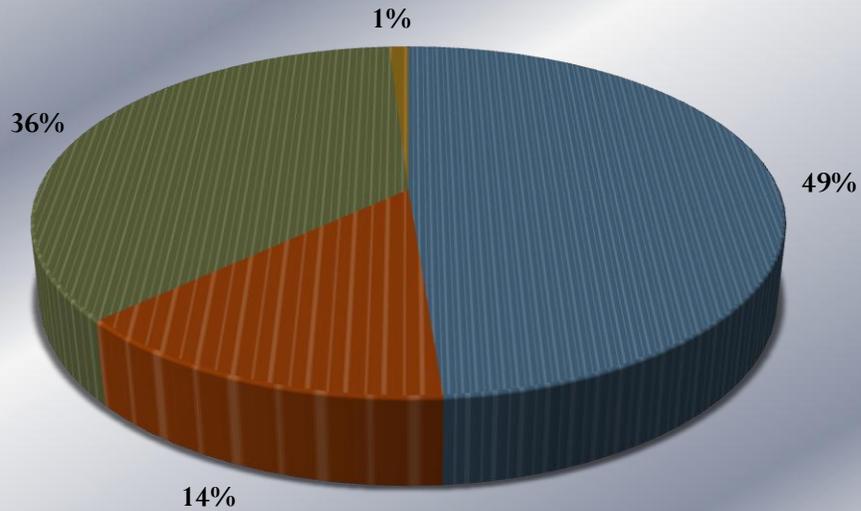
Use Support Summary for Aquatic Life, Warm 1 Rivers/Streams/Creeks



Degree of Use Support	Use Support Summary for Aquatic Life, Warm 1, in miles
	Rivers/Streams/Creeks
Fully Supporting	548.925
Not Supporting	1,509.93
Not Assessed	818.82
Insufficient Information	157.59

Use Support Summary for Aquatic Life, Warm 2 Rivers/Streams/Creeks

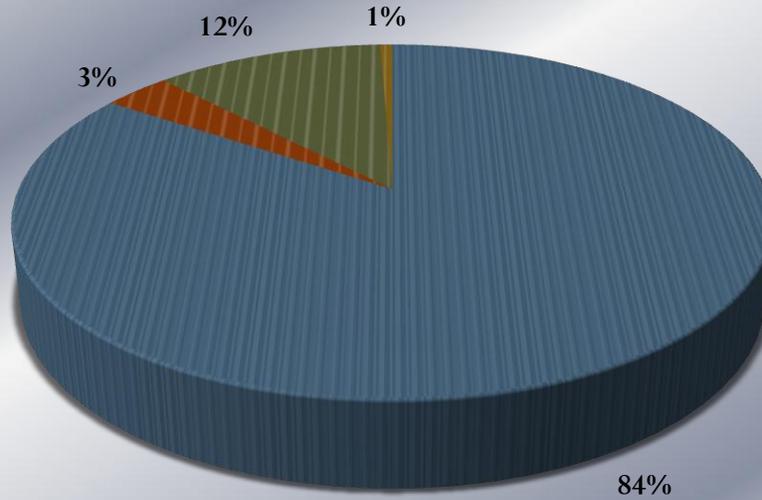
■ Fully Supporting 49%
 ■ Not Supporting 14%
 ■ Not Assessed 36%
 ■ Insufficient Information 1%



Degree of Use Support	Use Support Summary for Aquatic Life, Warm 2, in miles
	Rivers/Streams/Creeks
Fully Supporting	21,225.34
Not Supporting	6,259.35
Not Assessed	15,610.82
Insufficient Information	423.64

Use Support Summary for Domestic Water Source Rivers/Streams/Creeks

■ Fully Supporting 84%
 ■ Not Supporting 3%
 ■ Not Assessed 12%
 ■ Insufficient Information 1%

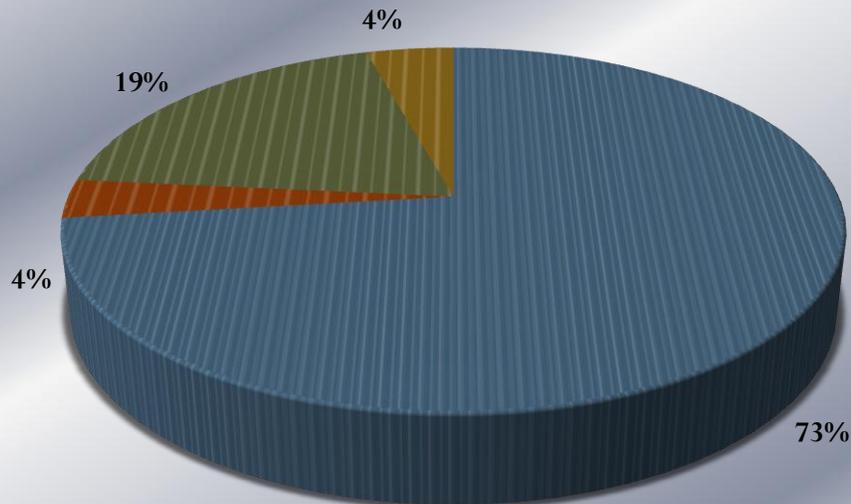


Degree of Use Support	Use Support Summary for Domestic Water Source, in miles
	Rivers/Streams/Creeks
Fully Supporting	36,425.04*
Not Supporting	1,476.84
Not Assessed	5,010.06
Insufficient Information	266.547

* While 84% of miles are fully supporting, less than half of all miles in the state have a water supply use.

Use Support Summary for Recreation, Primary Contact Rivers/Streams/Creeks

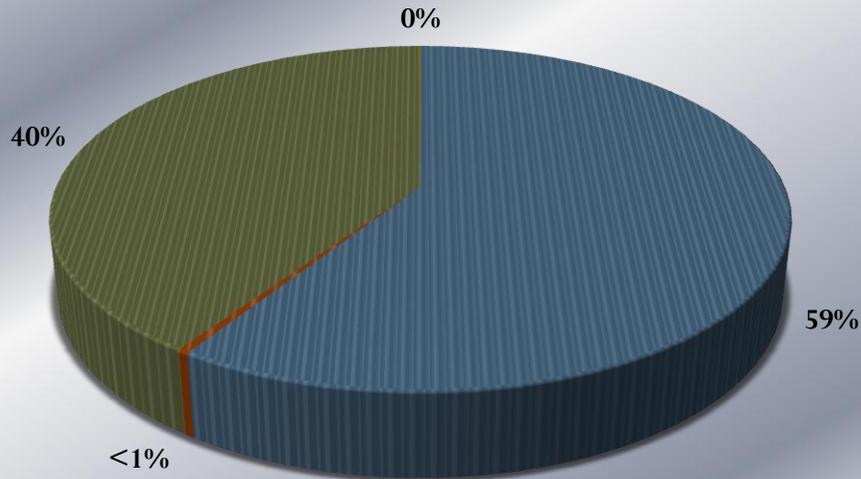
■ Fully Supporting 73% ■ Not Supporting 4% ■ Not Assessed 19% ■ Insufficient Information 4%



Degree of Use Support	Use Support Summary for Recreation, Primary Contact, in miles
	Rivers/Streams/Creeks
Fully Supporting	41,727.61
Not Supporting	1,942.39
Not Assessed	10,934.60
Insufficient Information	2,457.26

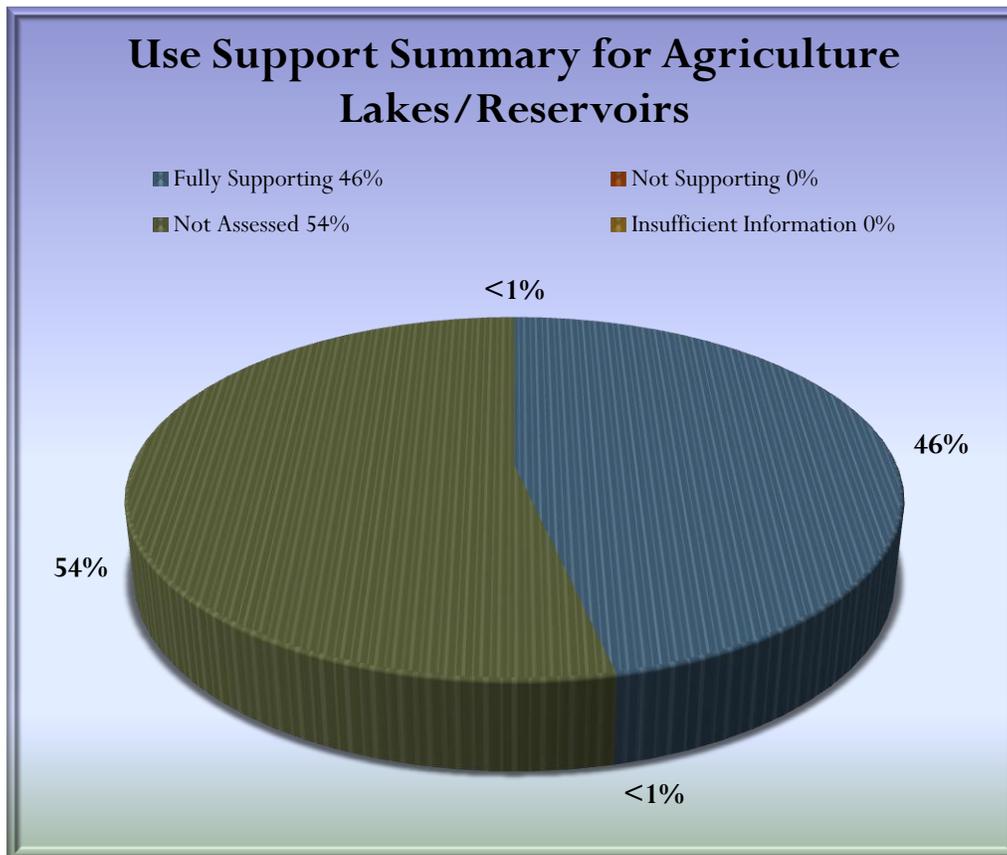
Use Support Summary for Recreation, Secondary Contact Rivers/Streams/Creeks

■ Fully Supporting 59%
 ■ Not Supporting 1%
 ■ Not Assessed 40%
 ■ Insufficient Information <1%



Degree of Use Support	Use Support Summary for Recreation, Secondary Contact, in miles
	Rivers/Streams/Creeks
Fully Supporting	21,825.16
Not Supporting	148.94
Not Assessed	14,911.13
Insufficient Information	51.52618

For Lakes and Reservoirs:

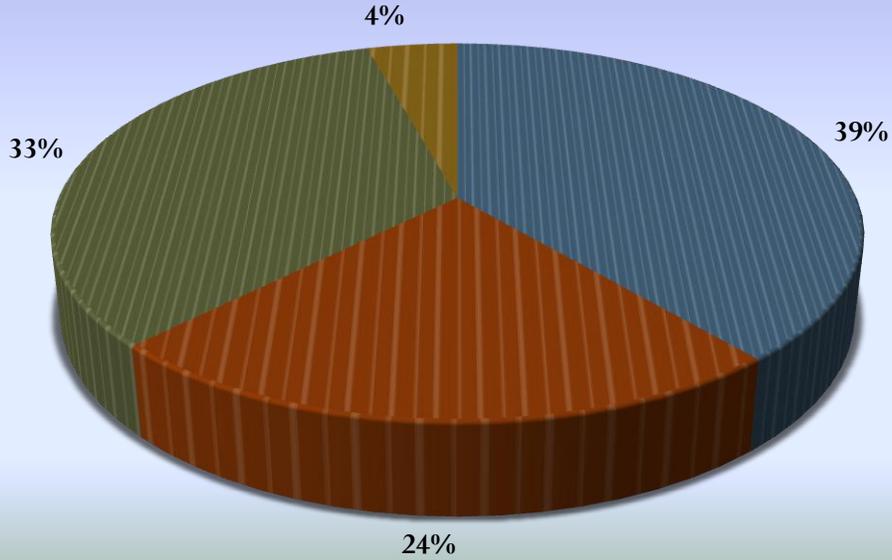


Degree of Use Support	Use Support Summary for Agriculture, in acres
	Lakes/Reservoirs
Fully Supporting	137,847.30
Not Supporting	0
Not Assessed	158,705.40
Insufficient Information	0

Use Support Summary for Aquatic Life, Cold 1 Lakes/Reservoirs

Fully Supporting 39%
 Not Supporting 24%

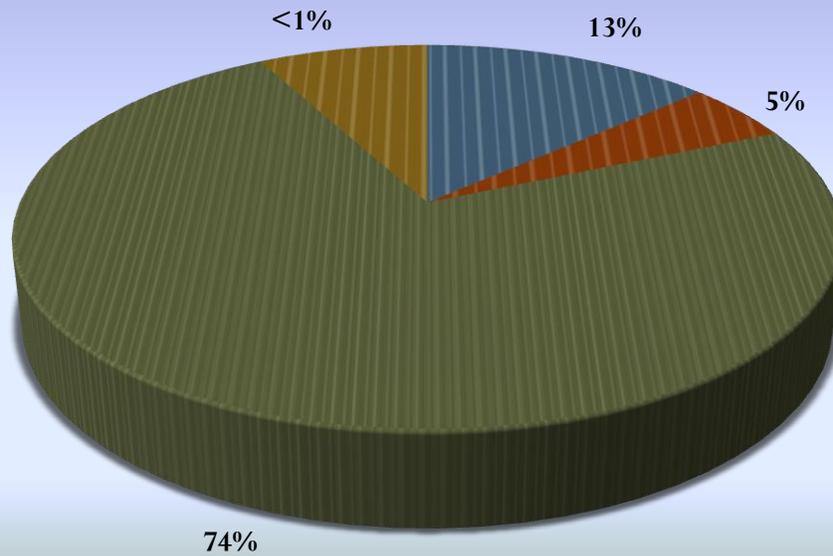
Not Assessed 33%
 Insufficient Information 4%



Degree of Use Support	Use Support Summary for Aquatic Life, Cold 1, in acres
	Lakes/Reservoirs
Fully Supporting	48,119.97
Not Supporting	29,489.89
Not Assessed	41,175.86
Insufficient Information	5,325.74

Use Support Summary for Aquatic Life, Cold 2 Lakes/Reservoirs

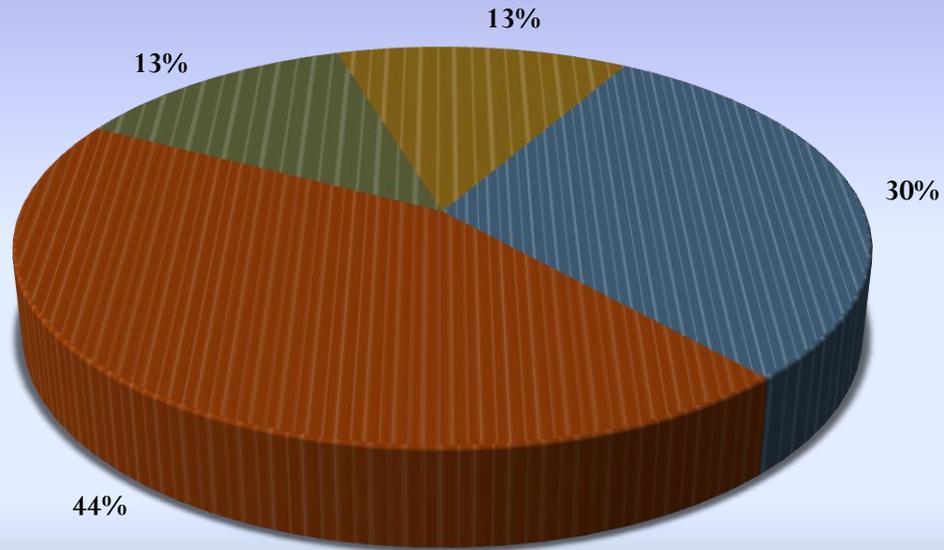
■ Fully Supporting 13%
 ■ Not Supporting 5%
 ■ Not Assessed 74%
 ■ Insufficient Information 8%



Degree of Use Support	Use Support Summary for Aquatic Life, Cold 2, in acres
	Lakes/Reservoirs
Fully Supporting	1,207.50
Not Supporting	448.3
Not Assessed	6,587.14
Insufficient Information	709.7

Use Support Summary for Aquatic Life, Warm 1 Lakes/Reservoirs

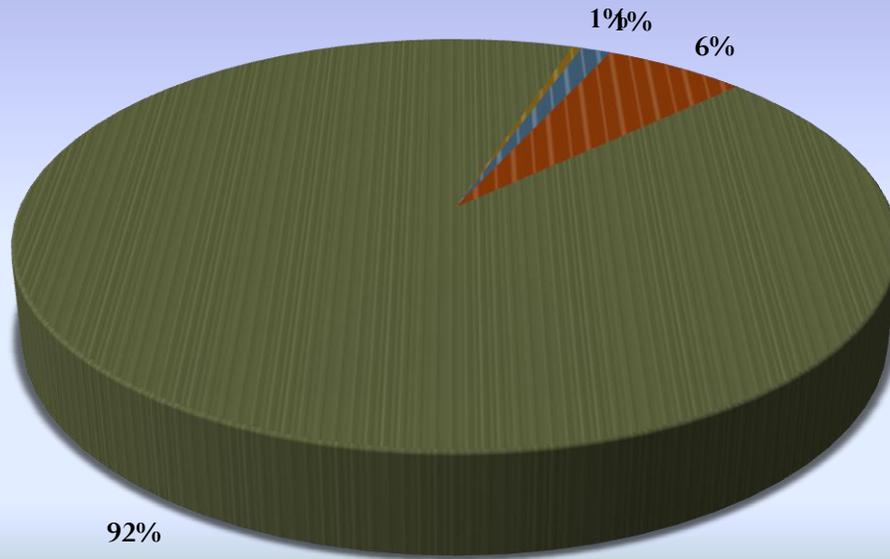
■ Fully Supporting 30%
 ■ Not Supporting 44%
 ■ Not Assessed 13%
 ■ Insufficient Information 13%



Degree of Use Support	Use Support Summary for Aquatic Life, Warm 1, in acres
	Lakes/Reservoirs
Fully Supporting	23,001.52
Not Supporting	33,855.39
Not Assessed	9,674.90
Insufficient Information	9,989.11

Use Support Summary for Aquatic Life, Warm 2 Lakes/Reservoirs

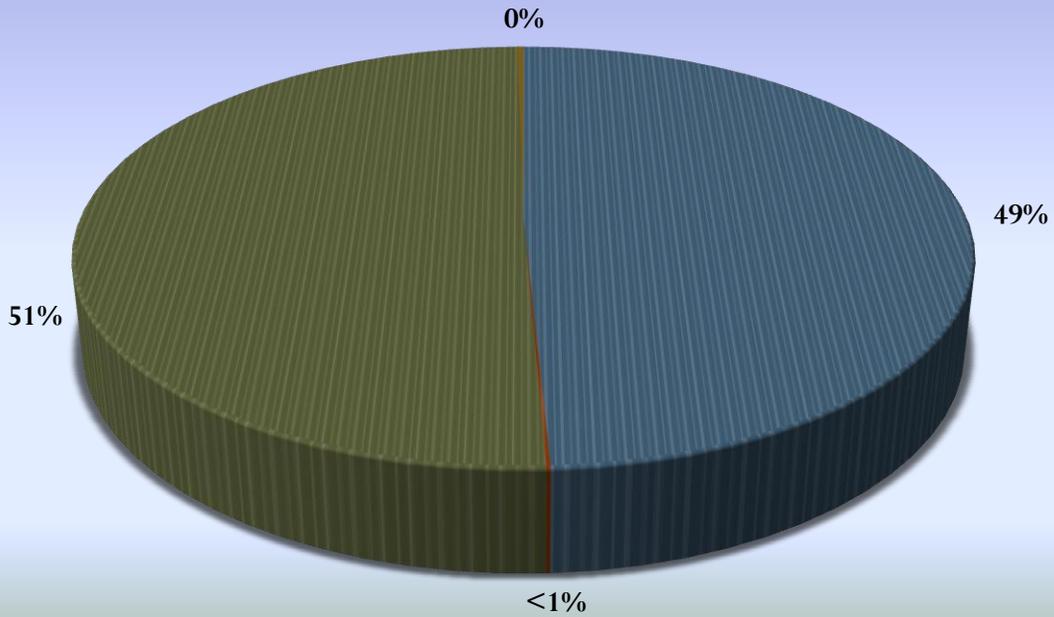
■ Fully Supporting 1%
 ■ Not Supporting 6%
 ■ Not Assessed 92%
 ■ Insufficient Information 1%



Degree of Use Support	Use Support Summary for Aquatic Life, Warm 2, in acres
	Lakes/Reservoirs
Fully Supporting	1128.74
Not Supporting	5,375.61
Not Assessed	80,127.05
Insufficient Information	365.40

Use Support Summary for Water Supply Lakes/Reservoirs

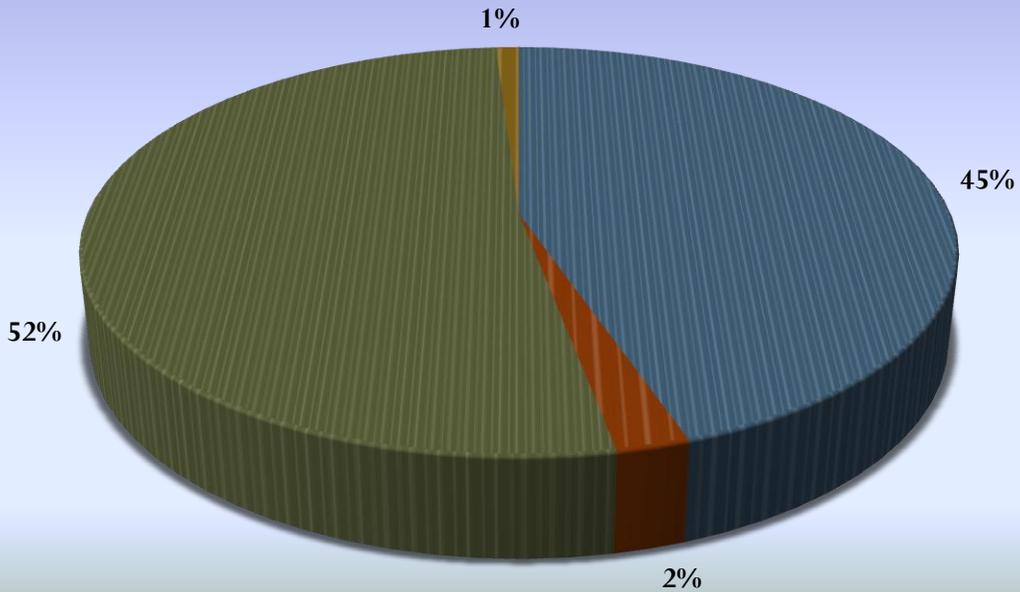
■ Fully Supporting 49%
 ■ Not Supporting <1%
 ■ Not Assessed 51%
 ■ Insufficient Information <1%



Degree of Use Support	Use Support Summary for Water Supply, in acres
	Lakes/Reservoirs
Fully Supporting	111,535.10
Not Supporting	290.6
Not Assessed	114,329.00
Insufficient Information	560.20

Use Support Summary for Recreation, Primary Lakes/Reservoirs

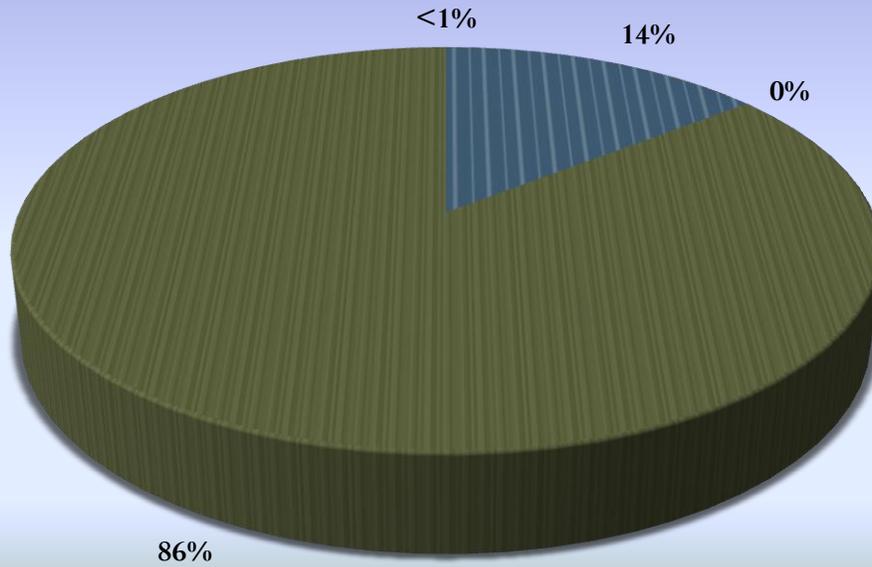
■ Fully Supporting 45%
 ■ Not Supporting 2%
 ■ Not Assessed 52%
 ■ Insufficient Information 1%



Degree of Use Support	Use Support Summary for Recreation, Primary, in acres
	Lakes/Reservoirs
Fully Supporting	123,668.80
Not Supporting	6,371.79
Not Assessed	143,717.00
Insufficient Information	2,809.99

Use Support Summary for Recreation, Secondary Lakes/Reservoirs

■ Fully Supporting 14%
 ■ Not Supporting 0%
 ■ Not Assessed <1%
 ■ Insufficient Information 0%



Degree of Use Support	Use Support Summary for Recreation, Secondary, in acres
	Lakes/Reservoirs
Fully Supporting	3,266.20
Not Supporting	0
Not Assessed	19,438.81
Insufficient Information, M&E List	0

Causes and Sources Affecting Use Attainability

In Colorado, when a narrative or numeric standard is exceeded, the associated use is determined to be in non-attainment and the cause and source affecting the waterbody is determined. The cause is the pollutant that contributes to the non-attainment. For example, if the aquatic life standard for zinc is exceeded, then the aquatic life use would be in non-attainment and the cause would be zinc. The source is the activity or facility that contributes the pollutant. An example of a source is resource extraction if metal exceedances are found in a historic mining district.

The following tables summarize the causes and sources contributing to non-attainment of uses for Colorado’s assessed waters. Those causes and sources yet to be determined are identified as “unknown.”

Table 4a: Summary of Causes Affecting Waterbodies Not Fully Supporting Classified Uses		
Cause Category	<i>Colorado Rivers</i> Miles Affected	<i>Colorado Lakes</i> Acres Affected
Biological Integrity (Bioassessments)	539.45	0
Harmful Algal Blooms – Chlorophyll-a	0	116.70
Toxic organics - Tetrachloroethylene	0	5.49
Sulfates - Mineralization	48.13	0
Metals		
Aluminum	90.57	0
Arsenic	244.36	0
Cadmium	809.62	0
Copper	1,040.47	2,416.50
Iron (trec)	1,293.01	883.60
Lead	185.02	237.20
Manganese	403.37	290.60
Mercury	9.6	24,301.54
Selenium	7,071.38	29,116.71
Silver	44.78	0

Table 4a: Summary of Causes Affecting Waterbodies Not Fully Supporting Classified Uses

Cause Category	Colorado Rivers Miles Affected	Colorado Lakes Acres Affected
Uranium	110.20	0
Zinc	907.88	0
Nutrients	0	116.70
Nitrate	45.80	0
Unionized Ammonia	99.70	3,977.23
pH	200.63	7,741.02
Siltation	215.64	0
BOD, organic sediment load	12.42	0
Dissolved oxygen saturation	242.84	11,927.55
Thermal Impacts	375.32	2,023.60
Pathogens - e. coli	2,050.93	0

“Cause” means the pollutants and other stressors that contribute to the non-attainment of classified uses in a waterbody.

Sum of the acres or miles affected does not equal the total non-attained acres or miles since non-attainment may have more than one cause.

Fun Fact: Roughly forty percent of the state is plains with the remaining portion equally divided between the plateau and mountain zones..



Table 4b: Summary of Sources Affecting Waterbodies Not Fully Supporting Classified Uses

Source Category	<i>Colorado Rivers</i> (Miles Affected)	<i>Colorado Lakes</i> (Acres Affected)
Agriculture Related Sources	1,793.98	0
Contaminated Groundwater	29.90	5.49
Highway/Road/Bridge Runoff (Non-construction Related)	16.30	0
Mining Related Sources	565.26	141.60
Natural Sources	19.08	141.60
Sources Unknown	5,595.17	48,309.08
Upstream Sources	47.17	0

Notes:

“Source” means the activities, facilities, or conditions that contribute pollutants or stressors.

Sum of the acres or miles affected does not equal the total non-attained acres or miles since non-attainment may have more than one cause.

Support for Classified Use Tables

This section gives an explanation for the Classified Use Support Tables included in Appendix A and Appendix B of this Report. These assessments are individually listed in this table according to stream segments. The following table provides an explanation of the Waterbody Identification (WBID) System used in Colorado. The basins are separated by Regulation Numbers. The Classified Use Table lists the assessments according to this system.

Table 4c: The Key to Colorado's WBIDs

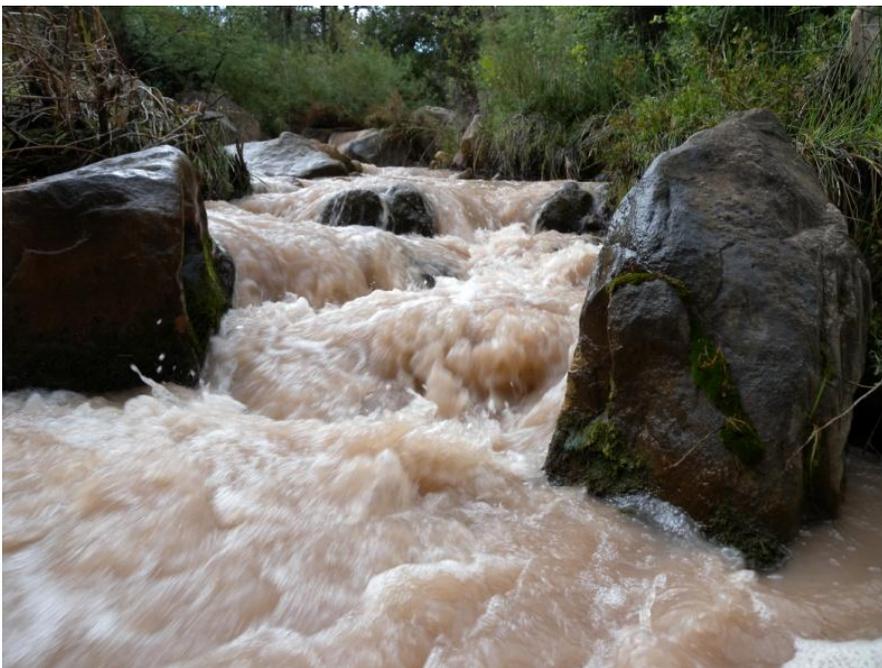
<i>Regulation Number</i>	<i>Letters 1-2 = Colorado</i>	<i>Letters 3-4 = Major River Basin</i>	<i>Letters 5-6 = Minor River Basin</i>
#32	CO	AR Arkansas Basin	UA Upper Arkansas River Basin MA Middle Arkansas River Basin FO Fountain Creek Basin LA Lower Arkansas River Basin CI Cimarron River Basin
#33	CO	UC Upper Colorado and North Platte Basin	UC Upper Colorado River Basin BL Blue River Basin EA Eagle River Basin RF Roaring Fork River Basin NP North Platte River Basin YA Yampa River Basin
#34	CO	SJ San Juan River and Dolores River Basins	SJ San Juan River Basin PI Piedra River Basin PN Los Pinos River Basin AF Animas and Florida Rivers Basin LP La Plata River, Mancos River, McElmo Creek and San Juan DO (Upper) Dolores River Basin
#35	CO	GU Gunnison and Lower Dolores River Basins	UG Upper Gunnison River Basin NF North Fork of the Gunnison River Basin UN Uncompahgre River Basin LG Lower Gunnison River Basin SM San Miguel River Basin LD Lower Dolores River Basin
#36	CO	RG Rio Grande Basin	RG Rio Grande River Basin AL Alamosa River/La Jara Creek/ Conejos Creek Basin CB Closed Basin/San Luis Valley Basin
#37	CO	LC Lower Colorado Basin	LY Lower Yampa/Green River Basin WH White River Basin LC Lower Colorado river Basin
#38	CO	SP South Platte Basin	US Upper South Platte River Basin CC Cherry Creek BE Bear Creek Basin CL Clear Creek Basin BD Big Dry Creek Basin BO Boulder Creek Basin SV St Vrain Creek Basin MS Middle South Platte River Basin BT Big Thompson River Basin CP Cache La Poudre River Basin LA Laramie River Basin LS Lower South Platte River Basin RE Republican River Basin

Appendices A and B tabulate, for each segment, the classified uses as well the corresponding attainment status for each use, the date of the most current assessment, identified sources and impairments, and the corresponding segment size. The methodology used in Colorado for assigning these categories is explained in the following table.

Table 4d: Comparison of EPA IR Categories to Colorado 303(d) Listings		
EPA IR Category	EPA Description	Colorado Description
1	All classified uses are supported, no use is threatened.	Fully Supporting for all uses. All uses have been assessed and all uses are fully supporting the classified uses.
2	Available data and/or information indicate that some, but not all of the classified uses are supported.	Some uses have been assessed and all uses assessed are fully supporting the classified uses. Other uses have not been assessed.
3	There is insufficient available data and/or information to make a use support determination.	Not Assessed for any uses. Segments where no water quality data has been collected and assessed are also placed in Category 3.
4a	A TMDL to address a specific segment/pollutant combination has been approved or established by EPA.	TMDL completed. May be supporting or not assessed and waiting for future monitoring to determine use support.
4b	A use impairment caused by a pollutant is being addressed by the State through other pollution control requirements.	Water is impaired but a TMDL is not needed because other mechanisms are expected to result in the attainment of Water Quality Standards in a reasonable period of time.
4c	A use is impaired, but the impairment is not caused by a pollutant.	A use is impaired, but the impairment is not caused by a pollutant.
5	Available data and/or information indicate that at least one classified use is not being supported or is threatened, and a TMDL is needed.	Placed on Colorado's 303(d) List. No TMDL has been completed.

In Colorado, the majority of the assessed surface waterbodies fall into IR Categories 1, 2, and 3. In some cases, a complete assessment of all uses cannot be completed due to the lack of data, but the data that is available indicates that at least some of the uses that were assessed are fully supporting. An example would be instances where an aquatic life assessment has been completed, but analytical results to assess water supply uses were not available. These segments would fall into Category 2. Colorado places segments that lack topical and conclusive evidence regarding attainment of standards on the M&E list, which could fall into Category 2 if other uses are assessed or into Category 3 if no other uses are assessed. Also included in IR category 3 are those waterbodies that were not assessed or for which no data exists during the current 305(b) assessment cycle. Segments for which an EPA approved TMDL has been completed are placed in IR Category 4a. In some cases, segments that previously were classified as IR Category 4a, have been re-assessed and placed in Category 1, as they are now are in attainment of all classified uses.

Regulation #93, Colorado's section 303(d) list of impaired waters tabulates all those segments that require a TMDL, (Appendix D) and tabulates all those waterbodies that are classified as IR Category 5.



WEST PARADOX CREEK FALLS

Water Pollution Control Programs

B2. Water Pollution Control Programs

This Section provides an overview of the Water Quality Control Division's (WQCD's or the Division's) water quality assessment and pollution control programs, and directs the reader to other documents where more information can be found.

The Water Quality Control Division

The WQCD is the primary agency responsible for maintaining, restoring and improving the quality of Colorado's waters, and for ensuring that safe drinking water is provided to the public from public water systems. The WQCD is organized into three programs: The Clean Water Facilities Program, the Drinking Water Program and the Watershed Program. The Watershed Program consists of three units: Environmental Data Unit, Standards Unit, and the Restoration and Protection Unit. The Clean Water Facilities Program consists of the Permits Section which includes an Industrial Permits Unit and a Domestic Permits Unit. The Safe Drinking Water Program consists of a Compliance Assurance and Data Management Section and an Engineering Section. In addition, the Business Services Unit and the Fiscal Services Unit operate under the WQCD Director's Office.

Water Quality Monitoring, Assessment and Reporting

A discussion of the Division's water quality monitoring assessment and reporting can be found in Chapter IV of the *Colorado Water Quality Management and Drinking Water Protection Handbook (Handbook)*. Division activities in the last two years are summarized in the Annual Reports to the Water Quality Control Commission (WQCC or Commission). <http://www.cdphe.state.co.us/op/wqcc/PubPart/handbook.html>

Monitoring Initiatives 2010/2011



PERIPHYTON SAMPLING

The Division conducts monitoring at a number of streams, reservoirs, and lakes around the state to determine their trophic status, develop TMDLs, and support changes to standards and classifications during triennial reviews. The Division's surface water monitoring activities for FY 2010/2011 were grouped into four general types: (1) routine sampling; (2) special studies; (3) lake and reservoir monitoring; and (4) aquatic life and habitat studies. The majority of the Division's sampling efforts were devoted to the collection of water chemistry samples from the

four major river basins across the state with an emphasis on the San Juan, Gunnison and Dolores River basins. River and stream sites in this basin are sampled for the purposes of reviewing and developing standards for triennial water quality standards reviews, water quality assessments, developing total maximum daily loads (TMDLs), Clean Water Act Section 303(d) listing determinations, and for reporting trends and water quality status in Colorado's Section 305(b) Report.

Routine Sampling

The Division uses a rotating basin approach for primary stream monitoring. The entire state is sampled on a five-year cycle that matches the Commission's schedule for triennial reviews of basin standards and classifications. For the purposes of conducting the triennial reviews, the state has been divided into four major river basins. Each of the four major river basins is sampled intensively once every five years. This allows the Division to concentrate its limited resources in one basin in order to provide a complete set of data in preparation for the triennial review scheduled for that basin. In every fifth year of the cycle, Regulation No. 31 (Basic Standards and Methodologies for Surface Water) is reviewed by the Commission and there is no need to intensively sample one of the major basins. For that year, sampling is more evenly allocated among the long-term trend sites in the four basins, special studies are conducted, specific data gaps may be filled, and other data needs met.

The number of sites and the number of times each site is sampled each year is controlled by the Division's fixed monitoring budget for laboratory analyses, which in FY 2011 was \$442,557 and \$477,909 in FY 2012. The samples collected are analyzed by the CDPHE's Laboratory Services Division. Depending upon the amount of data sought for a particular site and the accessibility of the site, sites are visited on a regular schedule (i.e. monthly, bimonthly, or when weather and road conditions allow access). In FY11, routine water chemistry samples were collected from a network of 322 sampling sites located across the state, with 64 percent concentrated in the Arkansas and Rio Grande River Basins, which were the focus basins in FY11. The Division allocated 15 percent of the sampling in the South Platte River Basin, 13 percent in the Colorado River Basin and 8 percent in the San Juan and Gunnison River Basins. This sampling resulted in the collection of 988 sample sets.

In State FY 2010, routine water chemistry samples were collected from a network of 299 sampling sites located across the state. The San Juan and Gunnison River basins were the focus in FY 2010. The Division concentrated 14 percent of the sampling in the South Platte River Basin, 13 percent in the Colorado River Basin, 9 percent in the Arkansas and Rio Grande Basins, and 64 percent located in the San Juan and Gunnison River Basins. This sampling resulted in the collection of 1136 sample sets. In both FY 2010 and 2011, samples were analyzed for a suite of constituents including metals, inorganics, nutrients and *E. coli* (*E. coli* only at selected sites in FY 2011). Field parameters such as dissolved oxygen, pH, conductance, and temperature were also collected.

Macroinvertebrate samples were also collected at 20 sites within the Arkansas and Rio Grande River basins as part of a pilot project in cooperation with WQCD, Watershed Section and the Standards Unit.

Special Studies

Special studies monitoring includes synoptic sampling events for Total Maximum Daily Load (TMDL) determinations, fish tissue sampling, and other water quality investigations. In FY10 TMDL sampling was completed

on various tributaries to the Lower Arkansas River downstream of John Martin Reservoir. These are primarily impaired for selenium, but several also exhibit elevated uranium concentrations. Additional sampling also took place on Illinois Gulch near Breckenridge to support development of a cadmium TMDL.

In FY11 TMDL sampling included multiple water column, inlet and outlet sampling at five lakes in the lower Arkansas sub-basin. These included Lake Henry, Lake Meredith, John Martin Reservoir, Adobe Creek Reservoir and Neegronda Reservoir. Lake sampling was focused primarily on selenium; however some sampling was also intended to support the Division's High Quality Waters study. Also within the Arkansas basin, multiple sampling events took place on Boggs Creek; a tributary to Pueblo Reservoir. Boggs Creek is impaired for selenium, uranium and zinc.

Elsewhere in the state, multiple synoptic sampling events occurred on the Rio Grande and tributaries between South Fork and Del Norte. This reach had been included on the 2010 section 303(d) List for copper.

The 303(d) Listing Methodology was revised in 2012 for the assessment of Fish Mercury (Hg). Listings for fish tissue mercury are no longer linked to the issuance of a Fish Consumption Advisory. Instead, the newly adopted methods compare the median fish Hg for each waterbody and species to a 0.3 ppm Hg threshold. A sample size requirement of 30 fish per waterbody/species was also introduced in order to list new waterbodies for Fish Hg.

Ten lake and river sites across Colorado were sampled and tested for the presence of mercury in fish tissue from July 1, 2009 through June 30, 2011 (FY2010 & FY2011). This effort resulted in 91 composite tissue samples for analysis by the Department's Laboratory Services Division. Of the 10 waterbodies tested in FY2010 and FY2011, no new 303(d) Listings were warranted. As of July 1, 2011, there are a total of 19 impaired waters due to fish tissue mercury according to the new methodology.

Arsenic and selenium were also analyzed in fish tissues from these reservoirs. The Division is currently working with the CDPHE Disease Control and Environmental Epidemiology Division to determine where 303(d) Listings are warranted for selenium. A risk assessment for arsenic in fish tissue is also being completed in FY 2012.

Lake and Reservoir Monitoring

The Division conducted lake and reservoir sampling in FY 2010 to assess if lakes in Colorado are in attainment of their designated uses. The San Juan and Gunnison Basins were the focus of lake sampling efforts in FY2010 (summer of 2009). Ten lakes in these basins were sampled three times each, once each month of the growing season (July, August and September). An additional 10 lakes in the Arkansas and Rio Grande basin were sampled one time each in late August and early September. The data from Arkansas and Rio Grande basins helped determine which lakes to focus sampling for FY2011.

At each lake, depth profiles of dissolved oxygen, pH, conductivity, and temperature were collected at one-meter intervals. Water quality samples were taken from the top two meters from the surface and 1-3 meters above the bottom. Samples were analyzed for a suite of chemical parameters including nutrients, metals, and inorganics. In addition, the surface sample was analyzed for the chlorophyll-a content as a measure of trophic status and for the phytoplankton population to determine the algal species composition.

Fun Fact: There are nearly 20 rivers whose headwaters begin in Colorado, with the Continental Divide directing each river's course.



The Division continued its lake and reservoir sampling in FY 2011. The Division visited 23 lakes and reservoirs during the algal growing season from June through September. Seven of the sites were located in the Arkansas/Rio Grande and were visited three times each. The remaining 16 lakes sampled were located in the Upper/Lower Colorado Basins and were sampled one time each. These lakes were sampled as a scoping mechanism to determine which lakes should be the focus for sampling the following season (FY2011).

Two lakes were sampled monthly in FY2010 and FY2011 by trained volunteers as a part of the Colorado Water Quality Lake Volunteer Program (Grand Lake, Ute Lake). Volunteers were trained on how to use *In-Situ* multi-probes for collecting dissolved oxygen, temperature, pH and conductivity from their lakes. After the volunteers were trained, profiles were collected monthly by the volunteer groups. Data was sent back to WQCD at the completion of the sampling season.

Aquatic Life and Habitat Studies

In 2010, the Division collected macroinvertebrate and habitat samples at 47 sites across the state, primarily within the South Platte River basin. At each of the habitat sites, water quality samples were taken and analyzed for a specific suite of chemical constituents. These data, plus habitat scores, periphyton samples, and occasionally substrate measurements, will be used in assessment of aquatic life use and 303(d) or Monitoring and Evaluation (M&E) listing decisions.

The aquatic life studies included targeted sampling of 303(d) and M&E listed stream segments (Lower South Platte River, Black Gore Creek, and Gore Creek), a special study of sediment impacted streams in the Deckers area (Trout Creek sub-basin), and a special study to investigate the expected aquatic community above three lagoon treatment facilities in the San Juan River basin as part of an ammonia recalculation project. The Division also initiated a pilot project where Division Water Quality Technicians would collect 20 macroinvertebrate samples simultaneously with water chemistry samples.

The Division worked collaboratively with a sciences professor at Western State College (Gunnison, CO) to collect and analyze macroinvertebrate data at 9 sites in the Upper Gunnison basin. The Division also provided necessary sampling equipment for the Bear Creek Watershed Association to continue sampling macroinvertebrates at 8 sentinel monitoring stations along Bear Creek, and sampling equipment and training to Grand County Water Information Network staff to collect macroinvertebrates at 8 monitoring stations in the Fraser River basin below Winter Park and Upper Colorado River mainstem below Windy Gap Reservoir. Additionally, the Division provided sampling equipment and training to the Mancos River Watershed Group to collect macroinvertebrates at 10 sites in the Mancos River basin.



FISH SHOCKING, GENEVA CREEK

Nonpoint Source Monitoring Requirements

Grant requirements under the Clean Water Act Section 319 prescribe that nonpoint source projects for on-the-ground restoration and remediation activities report measurable results. EPA defines measurable results as “restoring waters to partial or full uses and standards, or at a minimum, reducing pollutant loads such as nutrients and sediment.” To accomplish this, existing nonpoint source impacts must be quantified in order to provide a water quality baseline from which to measure improvements. Surrogate measures, such as a record of the best management practices installed, can be used to evaluate the total project effort, but do not provide data that equate to water quality improvements. As a result, the Division modified its approach to monitoring and evaluating nonpoint source projects. Starting with the 2004-2005 Nonpoint Source program funding cycle, sponsors are now required to provide more definitive water quality baseline data and subsequent post-project data to substantiate project outcomes.

Nonpoint source management activities are implemented by using a focused watershed-based approach. This approach was initiated in 2006 and synchronizes nonpoint source monitoring needs with the five-year, ambient monitoring schedule used to collect water quality data in support of the triennial review of basin classifications and standards.

The Nonpoint Source Monitoring program uses many types of data to evaluate water quality results: aquatic macroinvertebrates population richness and diversity, indices of physical habitat integrity and water quality chemical and physical data. To date, the program has measured about twenty implementation projects to evaluate water quality benefits.

Cooperative Monitoring Activities

To ensure that the maximum amount of relevant data is assessed each year, the Division issues a “call for data” to numerous cooperators, including federal and state entities, water quality management agencies, dischargers, and watershed groups, as well as River Watch and Nonpoint Source Management sponsors. Through this mechanism, the Division accumulates a considerable amount of data beyond what it can directly sample and analyze.

With the Division as a charter member of the Colorado Water Quality Monitoring Council (Council), the topic of cooperative monitoring efforts has been discussed with other stakeholders. To facilitate data sharing, the Council has initiated a Data Sharing Network. The Data Sharing Network is a statewide, web-based, water quality database and interactive map. Anyone who would like to share water quality data can upload their data through a template on the Internet. This data can be accessed (read only) by anyone. Anyone accessing the map can zoom into a particular watershed and click on a monitoring site (dots on the map) to find out who is monitoring at that site and what parameters exist. If the monitoring entity has uploaded data, the data can be viewed and downloaded. The data that is uploaded must comply with the STORET (EPA national database) requirements so that it is in a standard format that is usable by EPA and the WQCD.

A Clean Water Act Section 319 grant from the Division is funding this project and includes development of training materials, user training, and outreach to publicize the network and to seek out monitoring data to populate it. The

Division is continually working on ways to build its capacity to gather water quality through partnerships with other agencies and citizen groups.

Augmented Monitoring Funds

In order to upgrade state monitoring efforts and encourage implementation of the Monitoring and Assessment Strategies for States, the EPA placed an additional \$17 million in the Clean Water Act Section 106 state grants in Federal FY 2007 to be used for monitoring purposes. Colorado received \$374,000 of these “Monitoring Initiative” funds for a two-year period to facilitate the implementation of EPA’s 10 Elements document and to conduct a state-wide Probabilistic Survey of water quality as part of a national project. The Division has earmarked these funds for additional monitoring of rivers and lakes, a high alpine lake monitoring study, increased data management capabilities, and a pilot volunteer lake monitoring program. This program continues to fund Colorado’s effort to expand its monitoring and assessment capabilities.

A new position was created to design and formulate complex water quality investigations that entail the collection of additional surface water physical, chemical, and biological samples, and to assess the laboratory analysis data relative to applicable water quality standards and impairments throughout the state. The additional monitoring data generated by these activities will be used to 1) monitor surface water quality above and below point and nonpoint source control projects, and 2) monitor surface water quality prior to and after the construction of wastewater infrastructure projects that are funded using state revolving funds. The resulting data assessments will be used to evaluate the effectiveness of new and existing point and nonpoint source control projects. The information will also be used to prioritize areas for future point and nonpoint source control infrastructure investment. This additional funding is necessary to further implement the WQCD 2009-11 Strategic Plan Goals to 1) protect all designated uses and fully attain water quality standards; and 2) restore impaired water quality to attainable standards. This position, as well as the associated analytical costs, is funded through the Colorado Water Resources and Power Development Authority (CWRPDA) Board.



EAGLE RIVER BELOW MILK CREEK

Water Quality Standards

Water quality standards are dependent on the classified uses and are the regulatory basis for limits placed on discharges to waterbodies. A discussion of the water quality standards program can be found in Chapter IV of the *Colorado Water Quality Management and Drinking Water Protection Handbook (Handbook)*. The surface water standards review schedule is presented in Table 5 below.

Table 5: Surface Water Standards Review Schedule			
River Basins (and Regulation Number)	Issues Scoping Informational Hearing	Issues Formulation Informational Hearing	Rulemaking Hearing
Colorado Basin (No.33 & No.37)	October 2012	November 2013	June 2014
South Platte (No.38)	October 2013	November 2014	June 2015
Basic Standards (No.31)	October 2014	November 2015	June 2016
San Juan, Dolores & Gunnison (No.34 & No.35)	October 2010	February 2012	Sept 2012
Arkansas & Rio Grande (No.32 & No.36)	October 2011	November 2012	June 2013
Nutrient Controls	--	--	March 2012

The Water Quality Control Commission (“Commission”) held many hearings to review and revise water quality standards and classifications in Colorado during the 2010-2011 cycle. In February 2010, the Commission revised a temporary modification on an unnamed tributary to Ritter Draw in southwestern Colorado (Regulation No.34) to clarify that the temporary modification was based on uncertainty about the appropriateness of the underlying standard.

The Commission reviewed the Basic Standards and Methodologies for Surface Water (Regulation No. 31) in June 2010. The issues of nutrient criteria and biocriteria were separated from this hearing for later consideration (see October 2010). In the Basic Standard hearing, a discharger specific variance provision was adopted by the Commission with a delayed effective date of October 2013. Changes to the Temporary Modifications provisions were also adopted. The application of the dissolved oxygen provision for lakes and reservoirs was clarified and an averaging period was established for the *E. coli* standard. Several metals table values were adjusted based on new information.

In July 2010, the Commission held a rulemaking hearing to consider changing the expiration dates for temporary modifications so that they would coincide with the newly revised basin review schedule. The Basin reviews were delayed one year in order to make room in the Commission’s schedule for a rulemaking hearing to consider nutrient criteria in March 2012. The Commission took the following actions:

- Arkansas River Basin (Regulation No.32): 26 segments had temporary modifications that were scheduled to expire on 12/31/2012 and were extended to 12/31/2013.
- Upper Colorado and North Platte River Basins (Regulation No.33): The effective date for the Grand Lake clarity standard was extended to January 1, 2015.

- Rio Grande Basin (Regulation No.36): Two segments had temporary modifications that were scheduled to expire on 12/31/2012 and were extended to 12/31/2013.
- South Platte Basins (Regulation No.38): 26 segments have temporary modifications that are currently scheduled to expire on 12/31/2014 and were extended to 12/31/2015.

Policy 10-1, Aquatic Life Use Attainment: Methodology to Determine use Attainment for Rivers and Streams was adopted after a



SCULPIN

public hearing in October 2010. The procedures detailed in the guidance rely upon direct measurement of the aquatic life use rather than on comparing existing water quality to numeric aquatic life standards for individual pollutants. The policy relies on use of the Colorado multi-metric index (MMI) that is calibrated to respond to stressors that affect the aquatic macroinvertebrate community. Thresholds are established that identify when the current aquatic condition as measured with the MMI, are attaining the aquatic life use. The Policy will be reviewed by the Commission before it expires in

December 2013 and revised in light of new information and experience gained in the intervening years.

At the annual Temporary Modifications hearing in December 2010, the Commission reviewed the temporary modifications that were set to expire before December 31, 2012. This included temporary modifications on 72 segments in all of the regulatory river basins (Regulations No.32 through No.38). Site-specific standards proposals were considered for 2 segments in the Upper Colorado River Basin (Regulation No.33) and 2 segments in the Lower Colorado River Basin (Regulation No.37). Of the segments considered in this rulemaking, temporary modifications on six segments were deleted, 65 were left unchanged, one was extended, two segments in the Lower Colorado basin were re-segmented and temporary modifications were replaced by new underlying standards.

Also in December 2010, the Commission considered segment specific standards issues for segment 13a of the Lower Colorado sub-basin in Regulation No.37. The Commission decided to divide the segment into two parts but no new water quality standards were established.

The Standards Unit continued its preparation for the rulemaking hearing scheduled for March 2012, to consider nutrient values and control strategies (Regulation No. 31 and Regulation No.85). In addition, the basin-wide review of the San Juan and Gunnison River Basins (Regulation No.34 and No.35) is scheduled for September 2012.

Fun Fact: The town of Twin Lakes lies adjacent to two natural lakes at the foot of Colorado's highest Fourteener, Mt. Elbert.



Point Source Control Programs

The Permits Section of the Water Quality Control Division protects public health and the environment through issuance of discharge permits and other control mechanisms, as provided by the Colorado Water Quality Control Act. The permits program is multifaceted and covers industrial, domestic animal feeding operation wastewater discharges to surface waters and groundwater, stormwater discharges, industrial pretreatment, biosolids, and treated wastewater reuse programs. Permits are designed to limit the amount of pollutants entering streams, lakes and groundwater so as to protect the classified uses of the receiving water, and to protect public health and the environment. The Division's permitting activities are summarized in the Annual Reports to the WQCC.

Stormwater Program

Stormwater runoff is rainfall and snowmelt that runs over land surfaces, and has the potential to mobilize and transport pollutants that could adversely affect water quality. The Colorado stormwater program issues CDPS permits that authorize stormwater discharges associated with sources defined in Regulation No.61. The sources fall into three general categories: municipal separate storm sewer systems (MS4s), construction activities, and industrial activities. These stormwater discharge permits primarily include practice-based effluent limits that require the use of best management practices (BMPs) to control potential sources of stormwater pollution, and prevent additional unauthorized discharges from spills or other sources. Inspections and audits are conducted by the stormwater program to assess compliance with the permit conditions, and to identify unpermitted stormwater discharges that require permits. There are currently over 6000 active CDPS permits and general permit certifications for stormwater discharges.

Enforcement Program

The Water Quality Control Division's Enforcement Unit is responsible for assuring compliance with the requirements of the Colorado Water Quality Control Act (including its implementing regulations and the Colorado Discharge Permit System) and the Colorado Primary Drinking Water Regulations. These goals are accomplished through compliance assistance activities, and by reviewing self-reported or field-generated information, and by determining the appropriate response, which may include informal or formal inquiries, requesting additional field investigations, recommending and subsequently researching and developing administrative or judicial enforcement actions, and developing and negotiating civil or administrative penalties. Enforcement actions are issued on stormwater discharge permits actions, industrial discharge permit actions, domestic discharge permit actions, drinking water actions, housed commercial swine feeding operations actions, and confined animal feeding operations actions.

The work unit also assists in the maintenance of national databases as required under delegation agreements for the National Pollutant Discharge Elimination System (NPDES) and the Safe Drinking Water Act (SDWA). Additionally, the enforcement program quality assures self-reported data received from internal and external sources.



Discharge in compliance



Discharge out of compliance

Nonpoint Source Program

Nonpoint source pollution, unlike pollution from industrial activities and sewage treatment plants, comes from many diffuse sources. Nonpoint source pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, and underground sources of drinking water. These pollutants may be:

- Salt from agricultural and urban irrigation practices and acid drainage and metals from abandoned mines;
- Oil, grease, and toxic chemicals from urban runoff and energy production;
- Sediment from unprotected construction sites, crop and forest lands, and eroding stream banks;
- Excess fertilizers and pesticides from agricultural lands and residential areas;
- Bacteria and nutrients from livestock, pet wastes, and faulty septic systems.



The goal of the Nonpoint Source Program (NPS) is to restore waterbodies impaired by nonpoint sources of pollution and to prevent future impairments. One means of accomplishing this goal is through the implementation of projects funded under the Clean Water Act Section 319 Grant Program. Federal guidelines direct grant money to Clean Water Act 303(d) listed segments that are significantly impacted by nonpoint sources and to specific action items identified in the “Colorado Nonpoint Source Management Program” document.

The Management Program was last updated in 2005. The updated management program was approved by the Commission in August 2005, and a copy can be found at <http://www.npscolorado.com/2005MgtProgFinal.pdf>. Annual activities in the Nonpoint Source Program are described in the Division's Annual Reports. Table 6 lists the projects funded by Section 319 in 2010 and 2011.

Table 6: Nonpoint Source Projects funded by Section 319 in 2010 and 2011

Project Title	Project Sponsors	Year Funded	319 Funding Amount	General Project Type	Project Category
Upper South Platte Nonpoint Source Initiative	Coalition for Upper South Platte	2010	\$557,857.00	BMP Implementation	Stream Restoration
Coal Creek Restoration	Coal Creek Watershed Coalition	2010	\$166,583.00	BMP Implementation	Mining
Characterizing Bioaccumulation of Mercury in Sport Fish	CSU - Ft. Collins	2010	\$286,365.00	Monitoring / Assessment	TMDL Implementation
Supporting Selenium Control Efforts	North Fork River Improvement Association	2010	\$26,171.00	Monitoring / Assessment	Agriculture
Upper Kerber Creek Watershed Plan	Trout Unlimited	2010	\$25,000.00	Watershed Planning	Mining
Lower South Platte Watershed Plan - Phase II	Colorado Department of Agriculture - Colorado State Conservation Board	2010	\$79,587.00	Watershed Planning	Agriculture
Midway Stabilization and Riparian Improvements	North Fork River Improvement Association	2010	\$40,000.00	BMP Implementation	Stream Restoration
North Park Watershed Plan	Owl Mountain Partnership	2010	\$69,360.00	Watershed Planning	Agriculture

Table 6: Nonpoint Source Projects funded by Section 319 in 2010 and 2011

Project Title	Project Sponsors	Year Funded	319 Funding Amount	General Project Type	Project Category
Agricultural Efficiency and System Optimization Plan	Uncompahgre Valley Water Users Association	2010	\$37,500.00	BMP Assessment	Agriculture
St. Vrain Watershed Plan	St. Vrain Lefthand Water Conservancy District	2010	\$61,046.00	Watershed Planning	Agriculture
Watershed Planning Support	Colorado Watershed Assembly	2010	\$68,162.00	Information Dissemination / Web Support	Information & Education
Nonpoint Source Outreach Education	Colorado Foundation for Agriculture	2010	\$193,940.00	Information Dissemination	Information & Education
TMDL related mine reclamation projects (Hough and Penn mines)	DRMS	2010	\$280,000.00	BMP Implementation	Mining
Middle Colorado River Watershed Plan	Colorado River Water Conservation District	2011	\$64,600	Watershed Planning	Stream Restoration
Slate River Watershed Plan	Coal Creek Watershed Coalition	2011	\$61,390	Watershed Planning	Mining
Lower Bear Creek (Denver) Watershed Planning and Assessment	Groundwork Denver	2011	\$60,000	Watershed Planning	Urban
Greenway PURE Trash Reduction Campaign	The Greenway Foundation	2011	\$50,000	BMP Implementation	Urban

Table 6: Nonpoint Source Projects funded by Section 319 in 2010 and 2011

Project Title	Project Sponsors	Year Funded	319 Funding Amount	General Project Type	Project Category
Lightner Creek and Animas River Aquatic Habitat Improvement	San Juan Resource Conservation and Development	2011	\$159,245	BMP Implementation	Mining
Tools to Adress Agricultural Nutrient NPS Contamination	Colorado State University	2011	\$190,917	BMP Assessment	Agriculture
Chatfield Watershed Plan	Town of Castle Rock	2011	\$69,548	Watershed Planning	Urban
Data Sharing Network	Colorado Watershed Assembly	2011	\$116,677	Information Dissemination	Information & Education
NPS I&E Coordinator Position	Colorado State University	2011	\$77,000	Information Dissemination	Information & Education
Measurable Results Project	Colorado Watershed Assembly	2011	\$102,000	Monitoring / Assessment	Information & Education
Mine-related TMDL Implementation	Division of Reclamation, Mining and Safety	2011	\$435,562	BMP Implementation	Mining

Fun Fact: In 1859, John Gregory discovered the “Gregory Lode” in a gulch near Central City. Within two weeks, the gold rush was on and within two months the population grew to 10,000 people in search of their fortune. It was known as the “Richest Square Mile on Earth.”



Cost/Benefit Assessment

The citizens of Colorado expect a safe environment in which to live and thrive. It is easily taken for granted the availability of clean, safe drinking water, adequately maintained wastewater treatment facilities, and an aesthetically pleasing natural environment for recreation. The mechanisms for providing such a clean and safe environment are divided among the federal, state, and municipal governments. It is therefore difficult to obtain an accurate estimate of the cost of water pollution control efforts. A good estimate is possible by examining the funding received under the CWA. The following is the last five years annual costs for the WQCD to administer water pollution control activities. These amounts represent both federal and state expenditures and exclude all drinking water expenditures. NPS grant expenditures have also been excluded, as they are addressed in the NPS discussion earlier. All amounts have been rounded to the nearest hundred thousand.

- 2007 \$9.8 million
- 2008 \$11.0 million
- 2009 \$12.1 million
- 2010 \$11.1 million
- 2011 \$12.1 million



Water Pollution Control Revolving Fund Financial Assistance

The State Revolving Fund is a funding mechanism managed by the Division's Financial Solutions Unit (FSU). In 2010-2011, the Water Quality Control Division assisted with the planning and financing of a total of 22 water quality improvement projects throughout the state as outlined below in Table 7. These projects have improved water quality and restored and protected classified uses by reducing pollutant loadings through wastewater treatment facility upgrades, aging infrastructure replacement and consolidation with larger wastewater treatment systems. Funding was provided from the Colorado Water Pollution Control Revolving Loan Fund. The total amount of funding in the form of principal forgiveness, zero percent interest or low interest loans was \$112, 373, 839.

Table 7: Colorado Water Pollution Control Revolving Loan Fund and the Small Community Domestic Wastewater Grant Fund

Assistance Recipient	WPCRF Loan Amount	Project Description
Burlington, City of	\$1,974,000	The project consists of upgrading and expanding the existing wastewater treatment facility from 0.35 MGD to 0.9 MGD.
Upper Blue Sanitation District	\$2,000,000	The project consists of expanding the existing Farmers Korner wastewater treatment facility by 2 MGD.
Woodland Park, City of	\$705,000	The project consist of the expansion of the existing wastewater treatment plant preliminary treatment to replace hand cleaned bar screens with a fine mechanical screen and screening wash press, and adding a vortex grit remover and grit classifier.
Larimer County, Limited Improvement District, 2008-1 (Hidden View Estates)	\$300,000	The project consists of the replacement of non-compliant community septic systems with a new mechanical treatment facility that may include up to three new lift stations and extending both the collection system and force mains.
Fruita, City of	\$21,830,000	The Project consists of construction of a new 2.33 MGD wastewater treatment facility, approximately 2 miles of interceptor sewer and a new lift station.
Glenwood Springs, City of	\$31,460,100	The project consists of construction of 1.95 MGD of a new 3.9 MGD planned regional wastewater treatment plant, a new lift station, and 33,000 feet of force main.
Pueblo, City of	\$23,595,277	The project consists of upgrading the existing Pueblo Water Reclamation Facility to meet both future effluent limits and additional nutrient quality rules.
Crested Butte, Town of	\$1,900,000	The project consists of constructing a new secondary clarifier and rehabilitation of the collection system.

Lamar, City of	\$2,000,000	The project consists of replacing an existing wastewater lift station with the construction of a new lift station and head works facility.
Cheyenne Wells Sanitation District No.1	\$770,000	The project consists of lining cells No.2 and No.3, upgrading existing surface aerators, the installation of a modular cover for cell No.3, improvements to the existing disinfection system, headwork improvements, and various safety and security upgrades at the plant.
Cheraw, Town of	\$405,000	The project consists of cleaning, reshaping, and lining the existing two cells with the installation of an influent flow monitoring vault and flow monitoring equipment.
Mountain View Water and Sanitation District	\$288,601	The project consists of decommissioning an out-of-compliance lagoon treatment system.
Cherry Hills Heights Water and Sanitation District	\$240,000	The project consists of the excavation and replacement of approximately 469 linear feet of sewer main.
Boxelder Sanitation District	\$10,410,000	The project consists of construction of a new 3 MGD mechanical treatment system.
Brush, City of	\$9,465,000	The project consists of upgrades to the wastewater treatment facility including influent screening, grit removal, primary clarification, activated sludge with biological nutrient removal, secondary clarification and UV disinfection.
Campo, Town of	\$176,900	The project consists of modifying the existing lagoon system into a three cell lined stabilization lagoon system followed by constructed wetlands for effluent polishing.
Empire, Town of	\$499,995	The project consists of sanitary sewer system improvements including sliplining or replacement of 10 inch vitrified clay pipe, manhole repair, and replacement of the wastewater treatment plant's comminutor.
Eagle, Town of	\$1,288,966	The project consists of rehabilitation of the downtown wastewater collection system.
Olathe, Town of	\$500,000	The project consists of eliminating a non-permitted lagoon wastewater treatment facility within the Neal Subdivision and constructing a new gravity sewer main, new lift station and a new force main for conveyance of sewage from the lagoon site to the Town's wastewater treatment plant.
Tabernash Meadows Water and Sanitation District	\$365,000	The project consists of a dewatering press and head works screening enhancements in order to convert liquid biosolids into compost.
Silver Plume, Town of	\$200,000	The project consists of replacing manholes, sanitary sewer mains and lines and installing a net metering vault.
Crowley, Town of	\$2,000,000	The project consists of upgrades to the existing aerated lagoon/wetland wastewater treatment facility and includes the addition of a third constructed wetland cell.

Based on the annual survey of local governments across the state, the identified wastewater, stormwater and nonpoint source needs over the next 3-5 years total approximately \$2.49 billion (2012 WPCRF Intended Use Plan). Wastewater discharge permit requirements, aging infrastructure, and population growth are all factors in creating wastewater infrastructure needs.

Total Maximum Daily Load Development

The maximum pollutant load that a waterbody can assimilate and still attain standards is referred to as the “Total Maximum Daily Load”. In instances where a waterbody does not attain its assigned water quality standards it is identified as “impaired”, added to Colorado’s 303(d) List of Impaired Waters Still requiring TMDLs, and a TMDL is developed to address the impairment. The TMDL workgroup is responsible for the development of the pollutant load allocations to address impaired waterbodies.

For an impaired waterbody that requires a TMDL, the Division must quantify the pollutant sources and allocate allowable loads to the contributing sources, both point and nonpoint, so that water quality standards can be attained for that segment. TMDL development is a regulatory method for weighing the competing pollution interests and initiating an integrated pollution reduction strategy for point and nonpoint sources. TMDL development includes these five basic steps: 1) identify the pollutant to consider, 2) estimate the waterbody assimilative capacity, 3) identify the contribution of that pollutant from all significant sources, 4) analyze information to determine the total allowable pollutant load, 5) allocate (with a margin of safety), the allowable pollution among the sources so that water quality standards can be achieved. The complexity of the TMDL development is determined by waterbody, the sources and the pollutant being considered. While not all segments and TMDLs require complex computer modeling; some do.



UNCOMPAGRE RIVER BELOW RED MOUNTAIN

Implementation of the TMDL is the final step. It requires participation from all of the stake holders as TMDLs are not self implementing. The Waste Load Allocation portion of the TMDL can be implemented through effluent limits in discharge permits. In the case of non-point sources, voluntary controls or locally enacted controls are necessary to implement the Load Allocations. The State must rely on authority already granted by the Clean Water Act to implement TMDL's.

The Colorado Water Quality Management and Drinking Water Protection Handbook describes the Division’s process in Chapter V. Annual activities are described in the Division’s Annual Reports. Colorado’s 2012 Listing Methodology, Section 303(d) List (List of Impaired Waters Still Requiring TMDLs) and Monitoring and Evaluation (M&E) List are included as Appendix D.

Prior to 2008 the development of TMDLs by the Division was largely dictated by the provisions of a 1999 Settlement Agreement entered into by the State of Colorado, the Colorado Environmental Coalition and Biodiversity Legal Foundation, EPA, and other parties. The Settlement Agreement was terminated, with the agreement of all parties, in June of 2008. Since that time TMDL development has been dictated based upon the nature of the water quality

impairment, adequacy of existing water quality information, and synchronization with other programmatic mandates within the Division.

A list of TMDLs completed by the Division and approved by EPA during the previous two fiscal years is included as Table 8.

Table 8: Approved TMDLs from October 2009 through September 2011

<i>WBID</i>	<i>Waterbody</i>	<i>Parameters</i>	<i>Approval date</i>
COARUA10	Lake Creek	Cu	11/28/10
COGULG01	Gunnison River below N. Fork	Se	2/14/11
COGULG02	Gunnison River	Se	2/14/11
COGULG04a	Gunnison River tributaries	Se	2/14/11
COGULG04b	Lower Kannah Creek	Se	2/14/11
COGULG04c	Red Rock Creek	Se	2/14/11
COGUNF03	Lower N. Fork Gunnison River	Se	2/14/11
COGUNF05	Leroux Creek, Jay Creek	Se	2/14/11
COGUNF06a	Short Draw	Se	2/14/11
COGUNF06b	Big Gulch, Cottonwood Creek	Se	2/14/11
COGUSM03a	San Miguel River	Cd	8/03/10
COGUSM06a	Ingram Creek	Cd	8/03/10
COGUSM06b	Marshall Creek	Cd	8/03/10
COUUUG30	Henson Creek	Cd, Zn	7/29/10
COUUUG31	Palmetto Gulch	Cd, Zn	6/15/10
COGUUN02	Uncompahgre River, source to Red Mountain Creek	Cd, Cu, Zn	1/05/10
COGUUN03a	Uncompahgre River, Red Mountain Creek to Montrose	Cd, Cu, Fe(Trec)	1/05/10
COGUUN04b	Uncompahgre River, HWY 550 to Delta	Se	2/14/11
COGUUN04c	Uncompahgre River, Delta to Colorado River	Se	2/14/11
COGUUN06a	Red Mountain Creek, source to East Fork Red Mountain Creek	Zn(sculpin)	1/05/10

Table 8: Approved TMDLs from October 2009 through September 2011

<i>WBID</i>	<i>Waterbody</i>	<i>Parameters</i>	<i>Approval date</i>
COGUUN12	Uncompahgre River tributaries	Se	2/14/11
COSPBO04a	Gamble Gulch	Cd, Zn	8/12/10
COSPBO10	Boulder Creek	<i>E. coli</i>	9/27/11
COSPUS05a	Geneva Creek	Cd, Mn	9/20/10
COSPUS05a	Geneva Creek	Cu, Zn	9/20/10
COSPUS05b	Geneva Creek	Cd	9/20/10
COSPUS15	S. Platte River, Bowles Ave. to Burlington Ditch	Cd	7/19/11
COUCBL12	Illinois Gulch	Zn	1/1/10
COUCBL12	Illinois Gulch	Cd	7/28/11

Colorado Source Water Assessment and Protection Effort Summary

Colorado Source Water Assessment and Protection (SWAP) is an effort designed to provide the public consumer with information about their untreated drinking water, as well as provide the community with a way to get involved in protecting the quality of their drinking water. The program encourages community-based protection and preventive management strategies to ensure that all public drinking water resources are kept safe from future contamination.

The Water Quality Control Division (Division) completed the initial source water assessment reports for over 1700 public water systems in November 2004. The results of the assessment reports can be reviewed at: <http://www.cdphe.state.co.us/wq/sw/SWAP/swapreports.html>.

The Division's Source Water Assessment and Protection (SWAP) effort is transitioning from the assessment phase to the protection planning phase. The long-term project goal is voluntary development and implementation of local source water protection statewide. The success of the program will require a coordinated effort between the Division and local interests such as public water systems, interested stakeholders, and local governments.

The role of the Division is to assist local protection planning efforts by supplying the lead protection entity with the necessary consultation and tools to complete a protection plan. The Division has formulated a protection plan template that standardizes the format of protection plans. The template was developed to be user-friendly and accommodate the needs of a broad size range of public water systems. The protection plan template provides direction and guidance so systems can complete the document with an established Steering Committee to guide the process. The protection plan template is also available on the SWAP website at <http://www.cdphe.state.co.us/wq/sw/protectionplanningtemplate.html>.

Funding for protection planning is available from the State Drinking Water Revolving Fund (SDWRF) set-asides. The SDWRF set-asides enable the SWAP program to provide financial support for protection plan development. The set-asides allow the state to utilize a percentage of its capitalization grant to assist in the development of local drinking water protection initiatives and other State projects. The grant funds will be awarded for two types of projects: Pilot Planning Projects and Development and Implementation Projects.

Pilot Planning Project Grants supports exemplary and comprehensive source water protection plans. It is anticipated that, once completed, these pilot projects will serve as examples to others interested in developing plans to protect their drinking water sources. The completion of a limited number, but broad spectrum, of protection plan pilot projects will provide planning results to other protection planning entities to assist and promote source water protection planning efforts. These grants can range up to \$50,000 and will require a one to one financial match (cash or in-kind match). The Pilot Planning grants will also require the protection planning entity to evaluate the expenses related to replacing the current water source (ie: acquiring water rights, restructuring water supply system, economic impacts, etc.). The additional cost analysis will provide an estimated value of water resources to further understand the importance and significance of source water protection planning.

Development and Implementation Grants are awarded to public water systems and representative stakeholders committed to developing a source water protection plan. Grants up to \$5,000 will be awarded for plan development and for implementation. A one to one financial match (cash or in-kind) will also be required.

Grant proposals are submitted electronically and reviewed by Division. Projects recommended for funding will receive an award notification and a purchase order for the protection planning effort. All grant funds are distributed on a cost-reimbursement basis and invoicing will occur on a monthly (pilot planning grants) or quarterly basis (development and implementation grants). Proposals are accepted throughout the year. Grant awards are subject to the availability of SDWRF set-aside funds. For more details on grant requirements, guidance and access to the electronic grant application please visit the SWAP website at:

<http://www.cdphe.state.co.us/wq/sw/swaphom.html>.

The following table describes the current status of protection planning efforts statewide:

Table 9: Statewide Source Water Protection Planning Status			
State Fiscal Year	Annual Funding Encumbered	Number of Substantially Implemented Protection Plans	Population with Protection Plans
2009	\$77,220	17	59,877
2010	\$155,390	34	486,154
2011	\$149,240	44	548,824

Colorado's CWA Section 401 Water Quality Certification Program

A CWA Section 401 Water Quality Certification (WQC) is a state certification of a federal license or permit to construct or operate facilities which may result in any discharge to waters of the United States. A WQC is required from the Water Quality Control Division (Division) for Section 404 permits issued by the U.S. Army Corps of Engineers (Corps or USACE), Federal Energy Regulatory Commission (FERC) licenses for hydropower projects, and other federal permits which involve a



Wetlands protected from unstable soil during construction

discharge into waters of the state, including federal Clean Water Act Section 402 permits issued by the Environmental Protection Agency (EPA). The WQC applies to water quality impacts during both the construction and operation of the project for which the federal license or permit is required.

which became law on June 4, 1985. The regulation authorizes the certify, or deny certification of federal permits and licenses. The certification program defines best management practices (BMPs) applicable to nearly all certifications and procedures for developing conditions to be included with the certification where necessary.

The WQCC adopted Regulation No.82, Section 401 Certification Regulation in November 1985 to implement the requirement in the Colorado Water Quality Control Act Division to certify, conditionally

The certification process requires the Division to perform a preliminary antidegradation review and draft certification determination of the project for public notice in the *Water Quality Information Bulletin*. Following the month long public comment period the project is reviewed and evaluated with respect to public comment, antidegradation rules, basic standards for surface water and groundwater, water quality classifications and standards, any applicable effluent limitations or control regulations, best management practices to protect water quality, stormwater discharge requirements, and any project specific special conditions. If it is determined that the project will comply with all applicable requirements, the Division will issue a Regular Certification for the federal permit or license. If the Division concludes the project will comply with applicable requirements only if special conditions are placed on the permit or license, the Division will issue a Conditional Certification. If the Division concludes that there is not a reasonable assurance that the project will comply with applicable requirements even with the addition of special conditions, the certification is denied.

The Division prepares around 50 WQCs per year, principally in response to Section 404 individual permit applications to the Corps. It is estimated that half of these Corps applications are in the South Platte River Basin and are primarily associated with urban growth. In most cases the Division issues a Regular Certification requiring utilization of BMPs during construction and operation of the project to protect and maintain water quality. In cases where it is determined that typical BMPs are not adequate to protect water quality or monitoring of water quality is needed to determine if BMPs are functioning as anticipated, the Division has developed special conditions in

negotiation with the applicant. Many Conditional Certifications incorporate special conditions because the project is situated on an impaired waterbody. The Division has denied two projects since 2002. Both projects involved the applicant completing work prior to the issuance of the 404 permit. They did not use BMPs which later resulted in significant discharges to state waters, and therefore resulted in enforcement actions by the Division, the Corps and/or EPA.

There are currently several water supply development projects proposed in Colorado that will require a 401 WQC. These projects are associated with the diversion and storage of water in response to urban development. The potential impacts to water quality and stream flow have generated a fair degree of controversy. The Division issued a conditional WQC for one of these water supply development projects in 2010 which was appealed to the WQCC. The WQCC upheld the Division's certification and the petitioners have since appealed to state District court.

In addition, many FERC licenses are expiring and need renewal. Several current water storage facilities are also adding or increasing hydropower capacities, which require a 401 WQC. The Governor's Energy Office has currently identified approximately 30 small hydropower projects that are suitable for a conduit exemption or less than 5 kW licensing under FERC rules. This situation presents a special challenge to the Division to protect the existing uses of these waterbodies, as required by the Colorado Water Quality Control Act.

Colorado's Clean Lakes Program, CWA Section 314

Colorado has approximately 1,533 publicly owned lakes of greater than ten surface acres. The total surface acreage of these lakes has been estimated at 249,787. Significant publicly owned lakes are defined as those natural lakes, reservoirs, or ponds where the public has access to recreational activities, such as fishing and swimming, or where the classified uses, such as water supply, affect the public.

Section 314(a)(2) of the Clean Water Act requires states to report on the status of lake water quality as part of the 305(b) Report. Colorado conducted lake assessments under the Lake Water Quality Assessment assistance grant from EPA between 1989 to 1994. Since 1995, Colorado has not received separate funding for lake and reservoir monitoring.

During this biennium (7/2009 -7/2011), the Division monitored 43 lakes and reservoirs. The lake and reservoir monitoring efforts provide data to evaluate the trophic status of Colorado lakes and reservoirs. The data also are used to assess attainment of water quality standards.

Trophic state is a classification of lakes based on the level of biological productivity (especially algae) and nutrient status. Commonly used indicators of nutrient status and productivity include the amount of algae as measured by chlorophyll-*a*, water transparency as measured by Secchi disc depth, and in-lake epilimnetic total phosphorus concentration. The trophic state is broadly defined as follows:

- Oligotrophic: lakes with few available nutrients and a low level of biological productivity; characterized by clear water; often supports cold water fish species.
- Mesotrophic: lakes with moderate nutrient levels and biological productivity between oligotrophic and eutrophic; usually supports warmwater fish species.

- Eutrophic: lakes with high nutrient levels and a high level of productivity; typically supports exclusively warmwater fish species.
- Hypereutrophic: lakes in an advanced eutrophic state



Clear Lake Paradise Basin near Silverton

Trophic status is an index of water quality only to the extent that trophic condition limits the desired use of a lake (i.e., water supply or recreation). Generally, the effects of lake eutrophication are considered to be negative, especially if the eutrophication is accelerated by human activities. Negative effects include taste and odor problems for water supplies; reduction in water clarity, which is important for many recreational uses; and a reduction in the dissolved oxygen (DO) concentration in bottom waters to levels that are lethal to fish. Eutrophication often leads to increased fish production, but at the expense of desired species that inhabit cold deep areas, such as trout.

As part of the lake assessments, the Division also considers data collected by agencies other than the Division. Routine monitoring of publicly owned reservoirs is being, or has been performed, by the USGS, Army Corps of Engineers, Denver Water, and various other entities including cities, regional council of governments, and river basin associations.

The Division uses the Trophic State Index (TSI) developed by OECD (Organization for Economic Co-Operation and Development, 1982) to estimate trophic state for each lake. Data for the epilimnion (upper-most layer in a stratified lake) collected during the growing season were used to calculate the mean chlorophyll-*a* for each lake monitored by the Division in 2009 and 2010. Only lakes that had a minimum of three chlorophyll-*a* measurements within a summer were used for this assessment. Each lake's TSI was compared to the categories presented below (Table 10) to determine an overall trophic state (OECD, Eutrophication of Waters, Monitoring and Assessment, 1982). A summary of the lake assessments can be found in Table 11. The trophic conditions for each lake were not used for regulatory purposes, as nutrient criteria have not yet been adopted by the State of Colorado at the time this report was published.

Table 10. Boundary Values for Trophic Categories	
Trophic Category	Chl <i>a</i> (g/L)
Ultra-Oligotrophic	≤1
Oligotrophic	≤2.5

Mesotrophic	2.5-8
Eutrophic	8-25
Hypereutrophic	≥25

Table 11. Trophic Status of Colorado Lakes Monitored by WQCD in FY2010 and FY2011

Lake	WBID	Elev. (ft)	Surface Acres	Avg. Chl <i>a</i> (ug/L)	Avg. Secchi (m)	Estimated Trophic Status	Years Monitored
ADOBE CREEK	COARLA10	4124	5147	11.4	0.6	Eutrophic	2009 & 2010
ALBERTA PARK	CORGRG09L	10190	60	28.8	2.9	Hypereutrophic	2009 & 2010
DEWEESE	COARUA15L	7665	208	23.9	3.1	Eutrophic	2010
EGGLESTON	COGULG03	10141	164	3.9	2.5	Mesotrophic	2009
ISLAND	COGUNF04	10240	175	6.0	6.6	Mesotrophic	2009
JACKSON	COSPLS03	4438	2700	25.5	0.7	Hypereutrophic	2009 & 2010
LONETREE	COSPBT14	5132	502	3.6	3.1	Mesotrophic	2009 & 2010
NORTH STERLING	COSPLS03	4069	2880	34.0	1.5	Hypereutrophic	2009 & 2010
ROAD CANYON	CORGRG02	9273	140	27.2	1.6	Hypereutrophic	2009 & 2010
SKAGWAY	COARUA24	9080	90	1.3	4.5	Oligotrophic	2010
TRINIDAD	COARLA05b	6230	800	4.7	1.3	Mesotrophic	2010
UNION	COSPSV06	4965	736	2.3	1.6	Oligotrophic	2009

*Only lakes that had a minimum of three chlorophyll-*a* measurements within a summer were used for this assessment.

Nutrients control the rate of algal productivity in lakes. While nutrients are naturally occurring in the environment and are necessary food for plants, when excess nutrients enter a lake as a result of human activities, eutrophication is accelerated. This can result in nuisance algal blooms and excessive plant growth. Below is a pie chart that indicates the number of proposed lake listings for the 2012 303(d) List that are associated with each parameter (see Figure 2). Over half of the listings could potentially be attributed to nutrients (DO, DO(temp), pH, NH₃, Chl *a*).

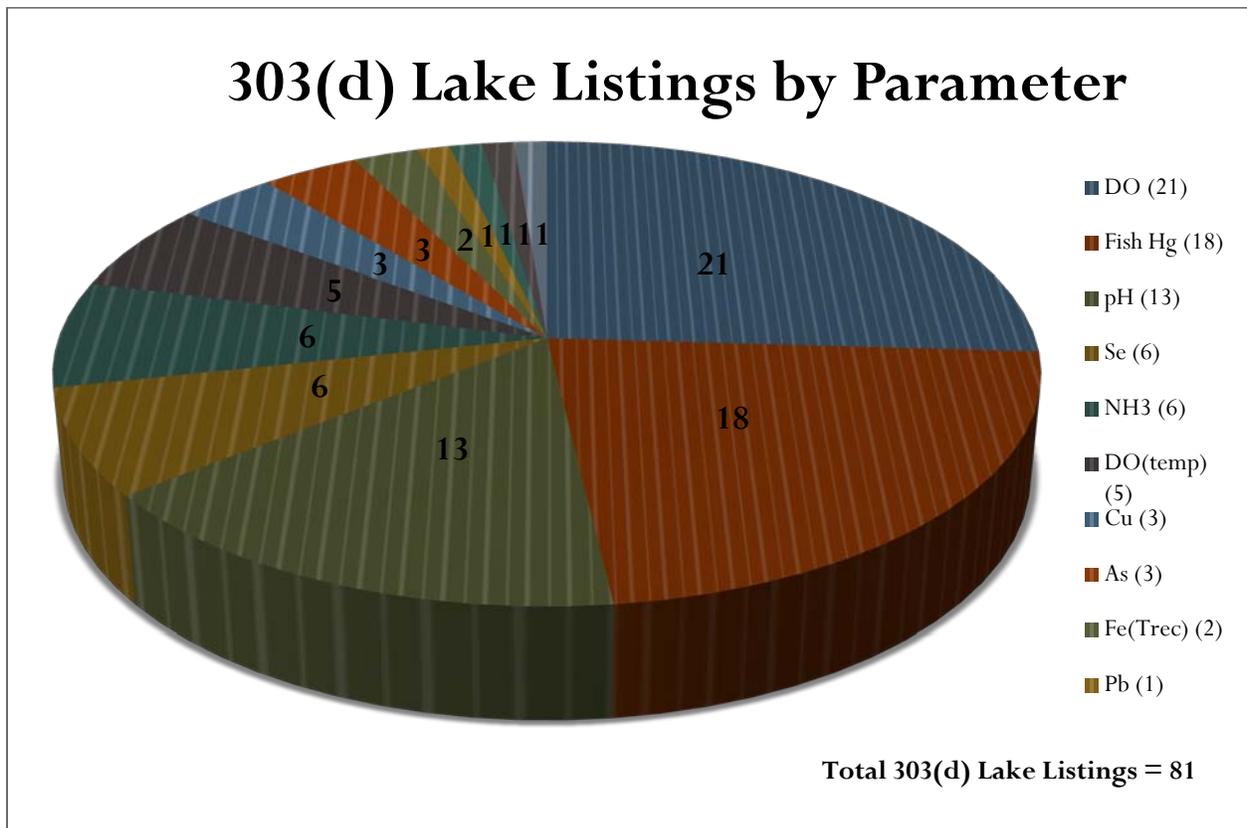


Figure 2.

Fun Fact: The most acidic snow in the Rocky Mountains falls in northern Colorado in and near the Mount Zirkel Wilderness Area



M&E Lake Listings by Parameter

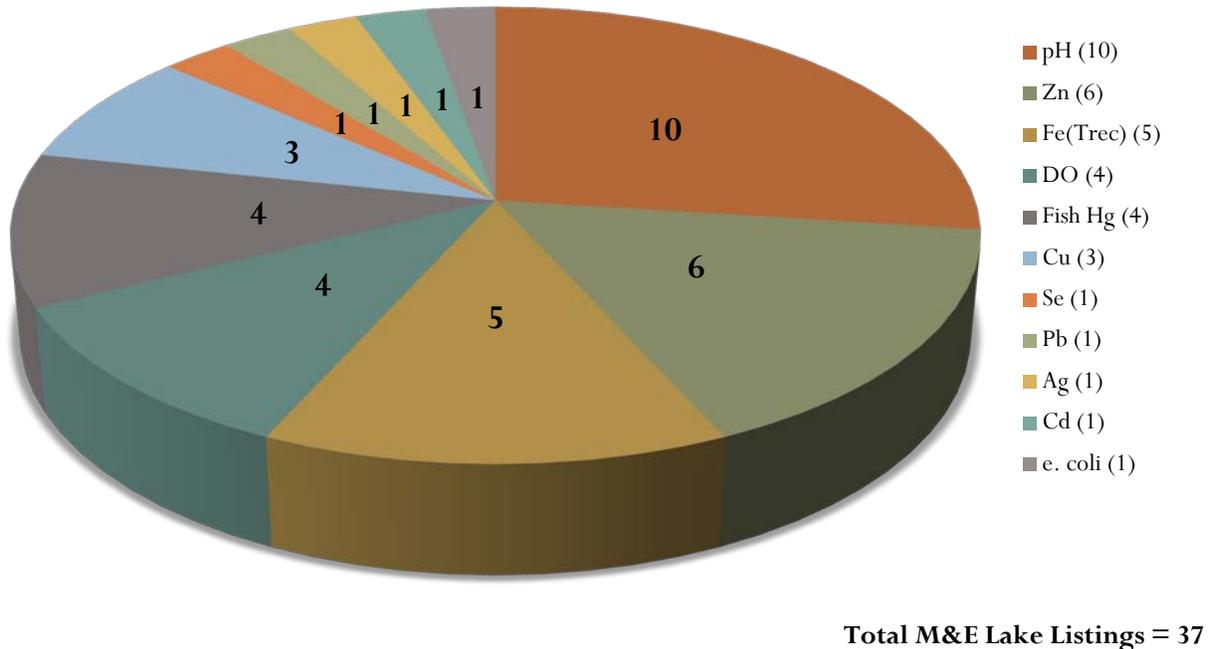


Figure 3.

Lakes Probabilistic Survey

The WQCD will receive funding to participate in the EPA Survey of the Nation's Lakes in 2012. Like the previous survey in 2007, the purpose of the survey will be to assess the condition of lakes across the nation by collecting a range of data from 1,000 randomly selected lakes in the lower 48 states. The indicators measured at each lake will be used to assess the water quality, ecological and recreational integrity of lakes throughout the nation. EPA provided the list of approximately 25 target lakes to be sampled for the Survey. The lakes were selected following a stratified random survey design. Desk and field audits will be conducted to determine which lakes will be a part of the target population and accessible to sample. Following the conclusion of the Survey, Colorado will publish a report summarizing the significance of the findings for Colorado Lakes.

Fish Consumption Advisory Program

The WQCD conducts an on-going study aimed at investigating the presence of certain contaminants (such as mercury, arsenic and selenium) in fish that can potentially be consumed by the population. The results of this study are the basis for issuing fish consumption advisories (FCAs) in the State of Colorado. FCAs are issued to protect public health and to address human health risk questions associated with consuming fish potentially contaminated with certain chemicals of concern. The Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD) works closely with Colorado Department of Natural Resources (CDNR) Colorado Parks and Wildlife (CPW), and CDPHE Disease Control and Environmental Epidemiology Division (DCEED) in the collection of data, the analysis of the data and the determination of human health risks from consumption of locally caught fish. This group of public health experts and scientists makes up the Fish Technical Advisory Committee.

In 2010 and 2011, the Water Quality Control Division and the Technical Advisory Committee updated the Fish Consumption Advisory Program by making two major changes to the program. First, the group established General Fish Consumption Guidelines to provide baseline advice regarding the consumption of locally caught fish. Over the last 6 years, CDPHE has analyzed greater than 1500 fish tissue samples from Colorado to determine trends in mercury concentration throughout the State. Fish tissue data from this study and across the country show that larger, predator fish species tend to have higher levels of mercury compared to smaller species at the base of the food chain. Based on this trend, the TAC is developing Guidelines for fish consumption derived from species trends seen across the state. The Guidelines will include fish meal recommendations by species for the general public and sensitive populations and will be made available to the public in the following ways:

- 1) Printed cards that can fit in a wallet
- 2) Signs posted at State Park Lake/Reservoir sites
- 3) Digital copy of the card on the CDPHE website

These guidelines will not have any regulatory implications and will not imply “use” impairment.

North Delaney Lake



The second change to the FCA Program included eliminating the link between Fish Consumption Advisories and 303(d) Listings. Moving forward, the Division will assess the impairment of the Aquatic Life Use classification using a new fish tissue action level of 0.3ppm, a level lower than the former 0.5ppm threshold. However, the Division will now compare the median mercury to the 0.3ppm threshold instead of the maximum mercury level that was used in the past. The Division also established a minimum data requirement to assess the attainment status of waterbodies with elevated mercury levels. This will ensure that 303(d) listings are based on statistically valid data sets. As of July 1, 2011, there are a total of 18 impaired waters due to fish tissue mercury according to the new methodology.

Fish consumption advisories are currently issued for waterbodies where fish tissue samples show mercury levels greater than 0.5 ppm. Advisories for 22 waterbodies have been issued by the Department based on this approach (approximately 20%). These are listed on the state's web site at <http://www.cdphe.state.co.us/wq/FishCon/analyses/>. Also listed are two other waterbodies that are not part of the mercury study, but were posted for other parameters: Sweitzer for selenium and Willow Springs Ponds for perchloroethylene. The Department is in the process of revising the method for how and when the State issues Fish Consumption Advisories. When this process is finalized, the list of waterbodies with advisories may change.

Table 12. Waterbodies in Colorado with Fish Consumption Advisories	
Waterbody	Contaminant
Berkeley Lake	Mercury
Brush Hollow Reservoir	Mercury
Carter Lake	Mercury
Catamount Reservoir	Mercury
Echo Canyon Reservoir	Mercury
Elkhead Reservoir	Mercury
Horseshoe Reservoir	Mercury
Horsetooth Reservoir	Mercury
McPhee Reservoir	Mercury
Narraguinnep Reservoir	Mercury
Navajo Reservoir	Mercury
Purdy Mesa Reservoir	Mercury
Rifle Gap Reservoir	Mercury

Rocky Mountain Lake	Mercury
Sanchez Reservoir	Mercury
Teller Reservoir	Mercury
Totten Reservoir	Mercury
Trinidad Reservoir	Mercury
Vallecito Reservoir	Mercury
Sweitzer Reservoir	Selenium
Willow Springs Pond	PCE
Boyd Lake	Mercury
Granby Reservoir	Mercury
Juniata Reservoir	Mercury

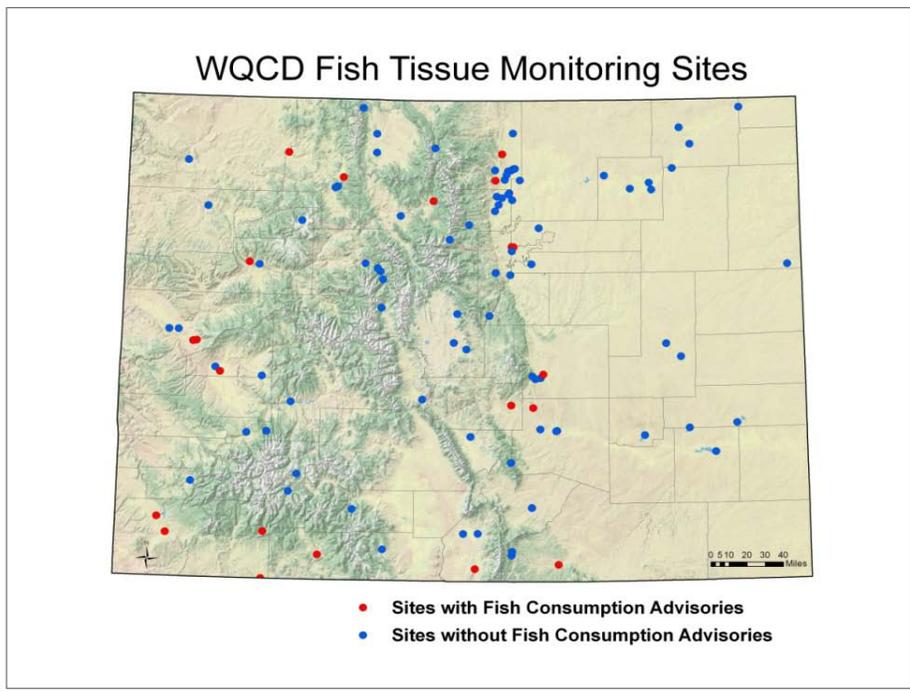


Figure 4. This map displays waterbodies where the WQCD has sampled for fish tissue contaminants. Fish Consumption Advisories have been issued for sites displayed in red due to elevated levels of contaminants such as mercury.

Colorado is aggressively addressing mercury in the environment. In 2008, the Air Pollution Control Division at the CDPHE completed work with electric utilities, industry, environmental groups and local governments on a rule to dramatically reduce mercury emissions from new and modified coal-fired power plants. The department helped develop a consensus agreement to monitor mercury emissions from power plants that will benefit lakes, streams, aquatic species and human health by reducing the amount of mercury that ends up in our natural ecosystems.

In addition, the department remains committed to a comprehensive mercury prevention and reduction campaign – the Mercury-free Colorado Campaign – to inform citizens, businesses and the medical industry about the health threat associated with exposures to mercury and to develop strategies to keep mercury out of our environment.

Fun Fact: Anglers at the turn of the century used mice, birds, and small rabbits as bait for the now-endangered Colorado Pike Minnow.



C1. Colorado's Groundwater Program

Groundwater protection in Colorado is diverse, with a number of State agencies undertaking varying roles in providing water quality protection and assessment. A number of these agencies, referred to as “implementing agencies”, are charged with protecting groundwater under separate Federal or State legislation. The various implementing agencies have developed program specific regulations, under their respective authorities, to address groundwater quality issues.

COLORADO GROUNDWATER QUALITY PROTECTION PROGRAM

In 2007, the Water Quality Control Commission (WQCC) conducted a triennial review hearing to address Colorado's Basic Standards for Groundwater (Regulation 41). During the hearing the WQCC updated and revised the numeric groundwater standards for toluene, ethylene dibromide (1,2-dibromoethane), and fecal coliform. The WQCC also adopted new standards for four pesticides; acetochlor, dicamba, metribuzin, and prometon. The WQCC also elected to implement the groundwater narrative standards on a statewide basis.

During 2008 and 2009 there were no additional groundwater classifications. Colorado currently has 53 site-specific groundwater classifications. One groundwater classification has been adopted as a surface water quality protection classification. Thirty-eight classifications were adopted as well head protection areas associated with municipal water supplies. An additional thirteen classifications have been adopted at existing oil fields, and are intended to work in conjunction with the Colorado Oil and Gas Conservation Commission (COGCC) regulation of Underground Injection Control (UIC) Class II wells. These oil field related groundwater classifications are one example of Colorado's efforts to coordinate groundwater quality protection efforts conducted by the various implementing agencies.

AGRICULTURAL CHEMICALS AND GROUNDWATER PROTECTION PROGRAM

<http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1167928159328>

The Agricultural Chemicals and Groundwater Protection Program is a collaborative program between the Department of Agriculture, Colorado State University Extension, and the Water Quality Control Division. The Department of Agriculture is the lead agency in the program. The purpose of the Program is to reduce agricultural chemicals' negative impacts on groundwater and the environment. Agricultural chemicals covered under this legislation include commercial fertilizers and all pesticides.

The Program's monitoring program has prioritized its sampling in basins where agriculture predominates and rural homes utilize groundwater. The groundwater quality data can be found through the Program's website.

DIVISION OF OIL AND PUBLIC SAFETY

<http://www.colorado.gov/cs/Satellite/CDLE-OilPublicSafety/CDLE/1240336920113>

The Division of Oil and Public Safety (OPS) has groundwater quality responsibilities under the Resource Conservation and Recovery Act (RCRA), Subtitle I of 1976 as amended. OPS regulates the assessment and remediation of petroleum releases at groundwater contaminated sites within Colorado.

DIVISION OF RECLAMATION, MINING AND SAFETY

<http://mining.state.co.us/>

The Division of Reclamation, Mining, and Safety (DRMS) is responsible for mineral and energy development, policy, regulation and planning under the Colorado Mined Land Reclamation Act and the Colorado Land Reclamation Act for the Extraction of Construction Materials. DRMS implements the Water Quality Control Commission's groundwater standards in permitted mining activities in the state.

DIVISION OF WATER RESOURCES/OFFICE OF THE STATE ENGINEER

<http://water.state.co.us>

The Division of Water Resources (DWR), also known as the Office of the State Engineer, administers water rights, issues water well permits, represents Colorado in interstate water compact proceedings, monitors streamflow and water use, approves construction and repair of dams and performs dam safety inspections, issues licenses for well drillers and assures the safe and proper construction of water wells, and maintains numerous databases of Colorado water information.



BLUE POOL , TELLURIDE COLORADO

OIL AND GAS CONSERVATION COMMISSION

<http://cogcc.state.co.us/>

The Colorado Oil and Gas Conservation Commission (COGCC) is an implementing agency for groundwater quality standards and classifications adopted by the Water Quality Control Commission (WQCC) for groundwater protection.

The COGCC issues permits for the drilling and operation of oil and gas wells, regulates production pit construction and operation, and enforces rules and regulations for the spacing of wells, wellbore construction and well site reclamation. Rules for the abandonment of wells and for the treatment and disposal of oil and gas production waste are also enforced. COGCC rules implement the statutory charge to prevent significant environmental impacts to air, water, soil or biological resources caused by oil and gas operations.

HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION

<http://www.cdphe.state.co.us/hm/>

The Hazardous Materials and Waste Management Division (MMWMD) is responsible for administering the Resource Conservation and Recovery Act (RCRA) and related programs. The Division regulates solid waste management, treatment and disposal facilities, and hazardous waste generation, storage, transportation, treatment, and disposal. The Division assists in the cleanup of hazardous waste sites including CERCLA/Superfund sites and uranium mill tailings. Other programs include participation in "brownfields" redevelopment through implementation of the Voluntary Cleanup and Redevelopment Act and cleanup assistance within the solid waste and hazardous waste programs both federal and non federal.

WATER QUALITY CONTROL DIVISION

<http://www.cdphe.state.co.us/wq/>

The Water Quality Control Division (WQCD) regulates the discharge of pollutants into the State's surface and groundwater under the provisions of the Colorado Water Quality Control Act of 1974. The protection and maintenance of water quality is achieved by issuing permits specifying the types and amounts of pollutants that may be discharged without violating the state water quality standards.

Fun Fact: Natural hot springs contribute 500,000 tons of dissolved solids (15% of total salinity) to streams in the Upper Colorado River Basin each year.



C2. Safe Drinking Water Program

This Section provides an overview of the Water Quality Control Division's (WQCD's or the Division's) Safe Drinking Water Programs.

Colorado Safe Drinking Water Program

The Colorado Safe Drinking Water Program ensures that public drinking water systems always provide safe drinking water to the citizens and visitors in the state. The program adopts and enforces regulations and provides assistance and incentives that further protect the quality of drinking water supplied by public drinking water systems. The Safe Drinking Water Program of the Colorado Department of Public Health and Environment is housed within the Water Quality Control Division which administers two major federal statutes as authorized by Colorado law: the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA).

The sections/units that implement the overall Safe Drinking Water Program and the services provided to external entities by each unit are depicted below.

- Compliance Assurance Section

Responsible for compliance assistance and assurance (enforcement) for all rules in the Colorado Primary Drinking Water Regulations, monitoring schedules, guidance document and reporting forms development, inventory requests and responding to non-compliance events including enforcement with the potential for issuing penalties.

- Engineering Section

This section reviews designs for drinking water infrastructure, performs sanitary surveys, and provides assistance responding to water treatment or distribution system failures, water quality/safety complaints/inquiries, and revolving loan fund eligibility determinations.

- Source Water Protection Program/State Revolving Funds (SRF)

Responsible for the source water protection program, source water protection management plan development assistance, planning and design grants, and infrastructure improvement state revolving loan processing. (The SWAP Program and the SRF Program are discussed in depth in Section B2 of this report.)

- Capacity Building Unit

This unit provides assistance in helping water systems achieve their full potential to provide the best drinking water for Colorado now and for future generations. The program provides operator training, performance improvement assistance, hosts an excellence program, training events, provides management tools, rate setting tools, and assists with operator certification reimbursement.

- Emergency Response and Security

Provides assistance responding to water treatment or distribution system tampering events, security and emergency response guidance documents, assists with vulnerability assessment and emergency response planning tools, and reporting information and forms.

- Excellence Program

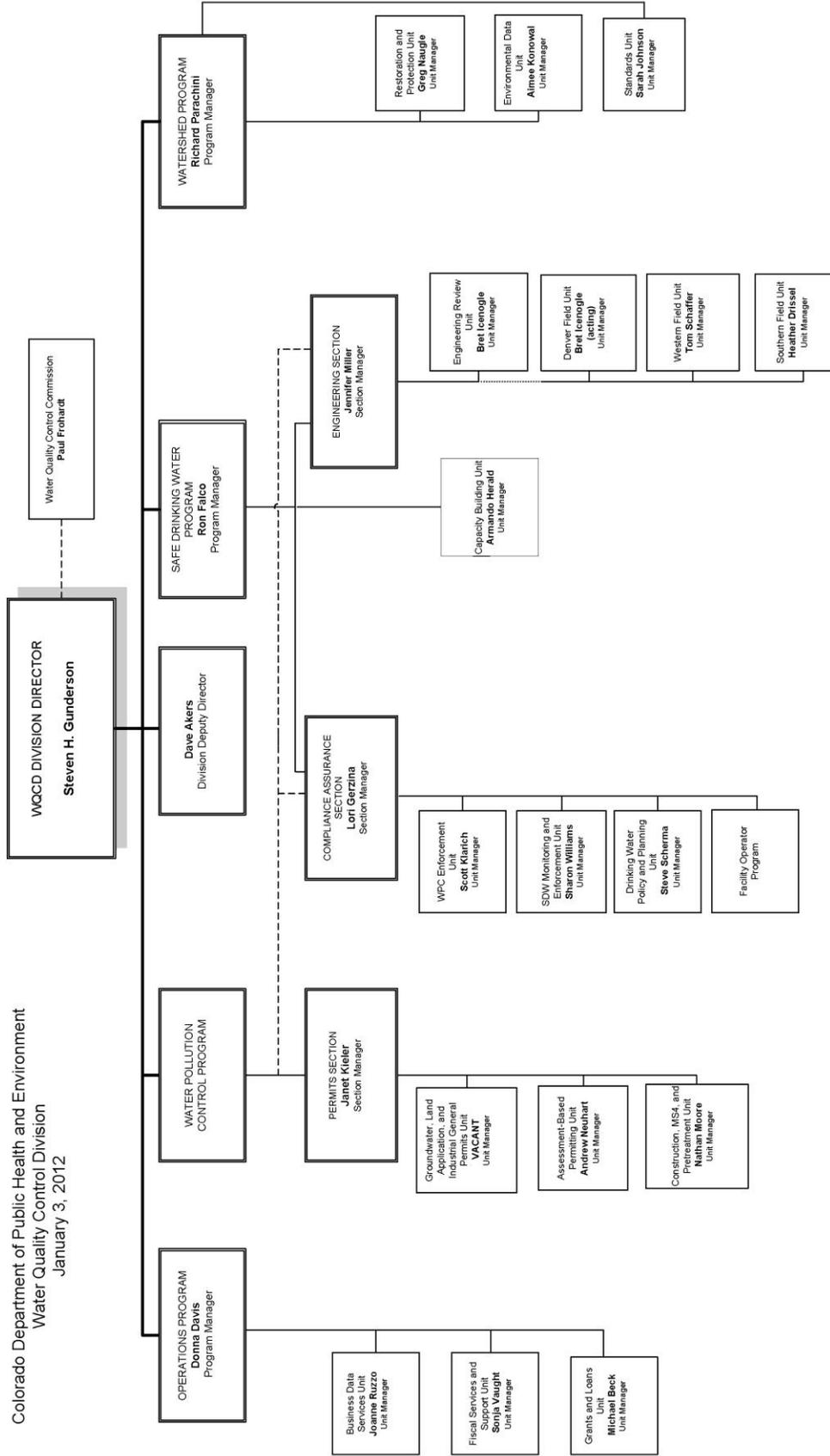
The Colorado Safe Drinking Water Excellence Program is an initiative being sponsored by the Colorado Safe Drinking Water Program within the WQCD. The program’s mission is to continuously improve public water system performance and public health protection in Colorado.

An organizational chart for the WQCD is included on page C2-2 for better clarity.

Fun Fact: The Platte River, whose name means “flat” was named by early French trappers and explorers. The Native Americans in the region named it Nibraskier, a similar word for flat.



Colorado Department of Public Health and Environment
 Water Quality Control Division
 January 3, 2012



Monitoring and Evaluation

Public water systems are required to monitor (i.e. sample) the quality of the water distributed to their consumers and ensure that water provided to consumers does not exceed promulgated health-based maximum contaminant level or treatment technique requirements. The required monitoring includes determination of the level of microbiological, chemical, physical, and radiological contaminants in their drinking water. The levels of detected contaminants are compared to an allowable maximum contaminant level. Detection of a contaminant in a finished water supply above the allowed maximum contaminant level may require public notification, and, in the case of a maximum contaminant level violation, the notification must include health effects information and explain any need for an alternate water source such as bottled water. Further, public water systems that exceed allowable levels of contaminants may be required to add or modify operational practices to reduce the contaminant level and achieve compliance.

The frequency of required monitoring is dependent on the type of water system, the water source, and the presence of contaminant generating activities in the area surrounding the water source. All public water systems must test for microbiological contaminants. Because of the short-term exposure of the population at transient non-community systems, the only chemical monitoring requirement is for nitrate, since this is generally the only common acute chemical contaminant. Non-transient non-community public water systems and community public water systems must monitor for many chemical contaminants because of the potential long-term exposure of the water users. Systems using surface water supplies have different monitoring requirements than groundwaters due to the different paths of contamination that the water sources are exposed to.

Certain monitoring requirements may be reduced through an assessment by the division of the vulnerability of the water supply. These vulnerability assessments are an evaluation of any existing sources of contamination that may affect the quality of the source water prior to treatment.

Enforcement Activities

The escalating enforcement process for drinking water is similar to that employed by the division for wastewater discharges:

- Identification of violation
- Informal notification of public water system
- Formal notification of public water system
- Formal enforcement action



BRIGHTON, CO PLANT

This predictable escalation of response to violations is predicated on the assumption that regulated entities generally desire to be in full compliance and that violations are generally the result of accidents or ignorance of all requirements. Egregious violations resulting in environmental harm or disease outbreaks or willful violations (such as those associated with data falsifications) demand the immediate and full application of the division's formal enforcement and penalty authorities.

Consumer Confidence Report

Another mechanism to help assure long-term compliance by public water systems is the requirement to provide consumer confidence reports. The report must include:

- the telephone number and name of the system's local contact and information about public participation opportunities;
- all sources of drinking water used by the system including a summary of the Source Water Assessment Report (SWAP) if completed;
- the treatment techniques used;
- definitions of terms used in the report;
- a list of all contaminants tested for;
- table(s) that lists contaminants detected in the water the last time they were tested. This table must include the date of sample, the applicable standards, the level detected, most likely source of the contaminant and any required health effects information; and
- any violations for the reporting year including length of the violation, any pertinent health effects information, and steps the system is taking to correct the violation;
- other required information regarding drinking water and vulnerable populations as required by the US EPA;
- the telephone number of the EPA hotline.

The Colorado program provides extensive assistance to water systems to ensure their compliance with the Consumer Confidence Report requirements



TOWN OF EAGLE, CO SANITARY SURVEY

Engineering Section

The engineering section operates under the safe drinking water program as well as the water pollution control program. The section performs wastewater and drinking water design reviews, as well as technical assistance and inspections. There are two Field Offices, a North Western Regional Field Unit located in Grand Junction, CO, and a Southern Regional Field Unit located in Pueblo, CO. District engineers and Drinking water engineers are assigned to all of Colorado's counties.

The engineering section also regulates grey

water reuse in Colorado. Grey water refers to the reuse of water from baths, showers, washing machines, and sinks (household wastewater excluding toilet wastes) for irrigation and other water conservation applications. Practically speaking, the use of grey water systems is not viable for most homeowners in Colorado. Currently, the treatment, disposal, and potential use of grey water is regulated by the State of Colorado *Guidelines On Individual Sewage Disposal Systems* (<http://www.cdphe.state.co.us/regulations/wqccregs/100306individualsewagedisposalsystems.pdf>) and applicable county Individual Sewage Disposal System (ISDS) regulations. The Colorado Department of Public Health and Environment (CDPHE) does not currently separate grey water from blackwater in its regulations. Consequently, surface applications require permitting and monitoring. Application of grey water from systems discharging 2,000 gallons or more per day requires site location and design approval (<http://www.cdphe.state.co.us/regulations/wqccregs/100222wqccdomesticwwtworks.pdf>) prior to construction of the grey water System and a discharge permit from the CDPHE; smaller systems require permits from the local health department.

Capacity Building Unit

The purpose of the Capacity Building Unit of the Safe Drinking Water Program is to provide training, technical assistance, and management support services to public water systems so they can strengthen their ability to supply safe drinking water to the public. Unit activities include:

<ul style="list-style-type: none"> • Coaching and Assistance • Drinking Water Excellence Program • Capacity Building Partners 	<ul style="list-style-type: none"> • Training Events • Security and Emergency Response • Unit Reports and Publications
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The goal of the Colorado capacity development program is to assist public water systems with the elimination of technical, managerial and financial capacity deficiencies and thereby ensure the consistent delivery of safe drinking water. The capacity development program identifies capacity deficiencies both in systems that are currently in compliance, and in systems that are not in full compliance. Once a system’s capacity deficiencies are identified, resources are directed to assist systems to eliminate the deficiencies. The division intends for this capacity development program to better enable Colorado’s public water systems to consistently provide safe drinking water, thereby preventing waterborne diseases.

Technical capacity: is the physical and operational ability of a water system to consistently provide safe drinking water. Technical capacity refers to the physical infrastructure of the water system, including the adequacy of source water and the adequacy of treatment, storage, and distribution infrastructure. It also refers to the ability of system personnel to adequately operate and maintain the system and to appropriately apply technical knowledge to consistently provide safe drinking water.

Managerial capacity: is the ability of a water system to conduct its affairs in a manner that ensures

Fun Fact: The United States Federal Government owns more than one-third of the land in Colorado.



that the system achieves and maintains compliance with the Colorado primary drinking water regulations. Managerial capacity refers to the system's institutional and administrative capabilities and considers the structure, and constructive linkage to external entities including customers, regulators and assistance sources.

Financial Capacity: is a water system's ability to acquire and manage sufficient financial resources to allow the system to achieve and maintain compliance with the Colorado primary drinking water regulations. Associated elements include having sufficient revenue to cover costs, access to credit through public or private sources, and use of standardized and accepted accounting, budgeting, and planning techniques.

Colorado Drinking Water Excellence program

The Colorado Drinking Water Excellence Program, hereafter referred to as the "Excellence Program," is an initiative sponsored by the Colorado Safe Drinking Water Program within the Water Quality Control Division (Division) of the Colorado Department of Public Health and Environment (CDPHE). The Colorado Safe Drinking Water Program originally introduced the concept of an Excellence Program in the Colorado Capacity Development Work Plan for SFY 2006-2008. The goal of the program is to help develop water system capacity and improve the performance of water treatment plants in Colorado through:

- Creating a definition of excellent performance for Colorado public water systems, and
- Providing advanced training in excellent performance, and
- Recognizing and awarding excellent performance from public water systems and individuals



Colorado Drinking Water Excellence Program

CoWARN

Another program in which the Division participates is the CoWARN Program. It is a formalized system of "utilities helping utilities" designed to facilitate mutual aid during emergency situations. Its infrastructure includes a secure web-based event tracking system and a practical mutual aid agreement designed to reduce bureaucratic red tape. Participation in any response is voluntary, and membership in CoWARN does not obligate members to offer aid. CoWARN's mission is to support and promote statewide emergency preparedness, disaster response, and mutual assistance matters for public and private drinking water and wastewater utilities for natural and human-caused events.

CoWARN is *NOT* a for-profit organization or a government program. It is a partnership between utilities, the state primacy agency, and utility professional organizations. CoWARN's overhead is financed by the Colorado

Department of Public Health & Environment (CDPHE); however, operational and procedural decisions are made by the utilities themselves.

CoWARN works with its various partners, linking the Colorado Water community to provide these resources and services:

- Business Continuity Planning
- Preparedness Aids - *Tools and security protocols to aid in continual risk assessment and updating Emergency Response Plans.*
- Message Mapping - *A series of updated boiler-plate public information and press release templates tailored to provide immediate public response.*
- Communications -
 - *Annual statewide meetings to bring together both significant state authorities and national interests, providing the best and latest insights to power a utility's ongoing preparedness process. These meetings will include workshops in utilizing CoWARN to the best advantage.*
 - *Technologies to facilitate sharing of information between members.*
- Outreach - *Through cooperating entities, CoWARN will offer emergency preparedness and related regulatory liaison services to requesting members.*
- Exercises & Training

Through CoWARN, technical support is provided to communities as needed. Because of CoWARN, assistance from many disparate sources can be mobilized very quickly.

Fun Fact: A dry wash or ephemeral stream flows during and for a short time after rain or snowmelt. Other names for a dry wash include: draw, gully, swale, arroyo, and gulch.



C3. Colorado's Wetland Resources

This section is new to the 2012 report and provides an overview of selected U.S. Environmental Protection Agency (EPA) funded wetland projects in Colorado, primarily focused on inventory and condition assessment. This section includes seven sub-sections:

1. EPA's Core Elements Framework for a Comprehensive Wetlands Program
2. Wetland Standards and Classification
3. Wetland Inventory and Mapping
4. Rotating Basin Wetland Condition Assessments
5. Participation in the National Wetland Condition Assessment
6. Watershed Approach to Wetland Mitigation
7. Additional Wetland Resources

Many of the efforts described in this section are being conducted by agencies and organizations outside the Water Quality Control Division (WQCD). Participating agencies are specifically noted where applicable.

EPA's Core Elements Framework for a Comprehensive Wetlands Program

Wetlands are an integral component of a state's aquatic resources. They provide valuable services including storm water retention, nutrient uptake, and wildlife habitat. In 2008, EPA's National Wetlands Division developed the Core Elements Framework (CEF),¹ which includes four core elements of a comprehensive state or tribal wetlands program. The four elements are: 1) monitoring and assessment, 2) regulation, 3) voluntary restoration and protection, and 4) water quality standards for wetlands.

In Colorado, no single agency or organization oversees work on all four of the core elements, nor is there an official coalition or council that facilitates joint work on all four elements. Instead, individual state agencies or organizations focus on particular aspects.

Inventory, monitoring and assessment of Colorado's wetlands (Core Element #1) has largely been led by the Colorado Natural Heritage Program (CNHP; www.cnhp.colostate.edu), a research unit of Colorado State University (CSU). Through partnerships with other agencies and organization, data generated through monitoring and assessment informs the other three elements.

¹ Further information on the CEF can be found at: water.epa.gov/grants_funding/wetlands/cefintro.cfm.

Regulation of wetland impacts in Colorado (Core Element #2) is primarily the jurisdiction of the U.S. Army Corps of Engineers (USACOE), under Section 404 of the federal Clean Water Act (CWA)

(www.nwo.usace.army.mil/html/od-tl/coloreg-home.htm). USACOE works in conjunction with EPA and numerous state agencies to process Section 404 permit applications. The WQCD provides input on Section 404 permits through the Section 401 Certification Program.

Voluntary restoration of wetland and riparian habitat (Core Element #3) is an active goal of many agencies and organizations in Colorado. The main state agency involved in this work is Colorado Parks and Wildlife (CPW), through the Wetland Wildlife Conservation Program (wildlife.state.co.us/LandWater/WetlandsProgram/), a voluntary, incentive-based program whose mission is to protect wetlands and wetland-dependent wildlife on public and private land. Each year, the CPW Wetlands Program provides ~\$1.5 million in funding for direct on-the-ground wetland restoration and enhancement. In addition to CPW, numerous federal agencies and non-profits encourage the restoration and conservation of wetland habitat through direct funding, landowner education, tax incentives, and many other initiatives.

Water quality standards for wetlands (Core Element #4) were developed for Colorado by the Water Quality Control Commission in 1993. See below for more details.

Wetlands Standards and Classification

The State of Colorado recognizes wetlands under the definition of “state waters” and therefore they are subject to basic standards for water quality. Under Colorado state law, wetlands are defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” This is the same definition used by both the EPA and USACOE under the federal CWA.

In 1993, the Water Quality Control Commission (WQCC or the Commission) convened a hearing to develop classifications and water quality standards for wetlands in Colorado. Fewer than 20 states across the country have taken this step. The statement of basis and purpose from this hearing is contained in WQCC Regulation 31.27.

In the hearing, a series of definitions were added to Regulation 31.5 to specify how water quality standards would apply to various kinds of wetlands (Table 13). The definitions, which include “constructed wetlands,” “compensatory wetlands,” “created wetlands,” and “tributary wetlands,” emphasize a wetland’s origin and landscape position relative to other surface waterbodies. The Commission recognized that many wetlands are created by human actions, either intentional or unintentional, and that water quality may differ depending on origin. With the exception of wetlands constructed for the primary purpose of wastewater or stormwater treatment, all wetlands within Colorado are considered state waters, but applicable classifications and standards differ.

Fun Fact: Leadville is the highest incorporated city in the United States at 10,430 feet elevation. Because there were lots of “silver” named towns at the time, the founding fathers suggested Leadville.



Table 13. Definitions applied to wetlands in Colorado for the purpose of state water quality regulation.

Name	Definition	Applicable Classifications and Standards
Constructed Wetlands	Wetlands intentionally designed, constructed and operated for the primary purpose of wastewater or stormwater treatment or environmental remediation.	Excluded from state waters and therefore not subject to classification and standards. All applicable permits must be obtained, however, if a constructed wetland is built on a previously existing wetland.
Compensatory Wetlands	Wetlands developed for mitigation of adverse impacts to other wetlands (e.g. wetlands developed pursuant to section 404 of the federal Act).	Included within state waters and subject to, at a minimum, the classification and standards of the segments in which they are located.
Created Wetlands	Wetlands other than compensatory wetlands created in areas which would not otherwise be wetlands in the absence of human modifications. Created wetlands include, but are not limited to, wetlands created inadvertently by human activities such as mining, channelization of highway runoff, irrigation, and leakage from manmade water conveyance or storage facilities.	Included in state waters and initially subject only to narrative standards for wetlands: Reg. 31.11(1)(b).
Tributary Wetlands	Wetlands that are the head waters of surface waters or wetlands within the floodplain that are hydrologically connected to surface waters via either surface or groundwater flows. Tributary wetlands do not include constructed or created wetlands.	Included in state waters and initially subject to interim classification and numeric standards: Reg. 31.7(1)(b)(iv).
Isolated Wetlands	Wetlands that are not tributary wetlands or created wetlands. (Definition not listed within Reg. 31.5, but included in Reg. 31.27).	Included in state waters and initially subject only to narrative standards for wetlands: Reg. 31.11(1)(b).

To protect Colorado’s wetland resources while minimizing disruption to the current standards, the Commission adopted a two-step process for the classification and standards application for wetlands. All tributary wetlands (except created wetlands) were initially subject to either a) standards set by baseline ambient quality, if known, or b) the classification and standards of the segment into which the wetland falls. As wetlands are not likely to be used directly as a drinking water source, the Commission exempted wetlands from the water supply classification and all standards specific to that classification. The second step would be the development and adoption of site-specific standards, potentially based on the functions of the wetland in question. For created wetlands and isolated (non-tributary) wetlands, only the narrative standards for wetlands initially apply, though site-specific standards may be adopted in the future. At the time of the hearing, the Commission specifically decided not to adopt biological criteria

as water quality standards for wetlands. The Commission also specified that wetland water quality standards should not be interpreted or applied in a manner that restricts the lawful exercise of water rights.

The Commission acknowledged in 1993 that the need to apply these standards was not expected to arise very frequently, and that has indeed been the case. The Commission did anticipate that the Division would occasionally develop site-specific standards for certain wetlands and stipulated that these would be reviewed during the Commission's triennial review of the basin in which the wetlands were located. To date, no site-specific standards have been developed and there are no plans to develop standards in the near future.

Wetland Inventory and Mapping

Total acreage of wetlands in Colorado is currently unknown. Estimates place the extent at roughly 1,000,000 acres or ~1.5% of Colorado's land area (Dahl 1990). Historically, Colorado's landscape likely supported twice the wetland acreage that exists today. It is estimated that 50% of Colorado's original wetlands have been drained and converted to farmland or urban development, or lost as a result of water diversion and storage.

In the mid-1970s, the U.S. Fish and Wildlife Service (USFWS) created the National Wetlands Inventory (NWI) to map and classify wetlands across the United States. NWI mapping protocols and classification system (Cowardin et al. 1979) are now recognized as the federal standard for wetland mapping. Colorado was one of the first states to be mapped through the NWI program. However, the state was mapped between the late 1970s and early 1980s, before widespread use of computer driven geographic information systems (GIS), when the NWI produced hard copy paper maps. Though useful on a project-by-project basis, paper maps cannot be used to calculate total acreage of wetlands or summarize wetland acreage by class. While many states have subsequently converted paper maps to a digital,



RIPIARIAN VEGETATION ALONG SAGUACHE CREEK

geospatially rectified format, the availability of digital spatial data for wetlands in Colorado is limited.

Since 2008, the Colorado Natural Heritage Program (CNHP) and Colorado Parks and Wildlife (CPW) have partnered with the NWI program to convert paper NWI maps into digital data that can be used in GIS analyses. This partnership began with an EPA Region 8 Wetland Program Development Grant (WPDG) and has been augmented with funding from numerous additional partners. Prior to 2008, digital wetlands data existed for <15% of the state. From

2008–2011, CNHP and CPW converted 458 quads area of mapping available in 2012 to >40% of the state (Figure 1). In addition, CNHP created 62 quads of newly updated NWI mapping based on photo interpretation of 2009 color infrared imagery from the National Agricultural Imagery Program (NAIP). Updated mapping includes portions of the northern Front Range corridor and all of Park County.

There are 944,275 acres of wetlands and waterbodies mapped (Table 14) within the portion of the state that contains digital NWI data (Figure 1, areas shown as digital data or submitted). Along with wetlands, NWI mapping also includes waterbodies such as lakes, reservoirs, rivers, streams, and canals. Of the acres mapped by NWI, 10% are

lakes and reservoirs and 9% are rivers, streams, and canals. The remaining 81% (764,769 acres) are wetlands. Herbaceous wetlands comprise 69% of all wetland acres and shrub wetlands comprise 21%.

It is important to note that the definition of wetlands used by the NWI program differs slightly from the definition used by EPA and USACOE under the federal CWA and by the State of Colorado for water quality standards. The NWI definition is broader and more ecologically based than the regulatory definition. This difference is due in part to the limitations of aerial photo interpretation and in part to USFWS' interest in wetland habitat for wildlife species. The extent of wetland acreage based on NWI mapping, therefore, may differ from the extent of wetlands considered state waters.

Digital wetland mapping is available to the public through two online mapping tools. USFWS supports the NWI Wetlands Mapper (www.fws.gov/wetlands/Data/Mapper.html), where users can view and download all official NWI data. In addition, CNHP and CPW recently developed the Colorado Wetlands Inventory (www.cnhp.colostate.edu/wetlandinventory), an online mapping tool that displays Colorado NWI data plus data from several non-NWI wetland mapping projects, such as playa wetlands mapped on the eastern plains or fen wetlands mapped in the mountains.

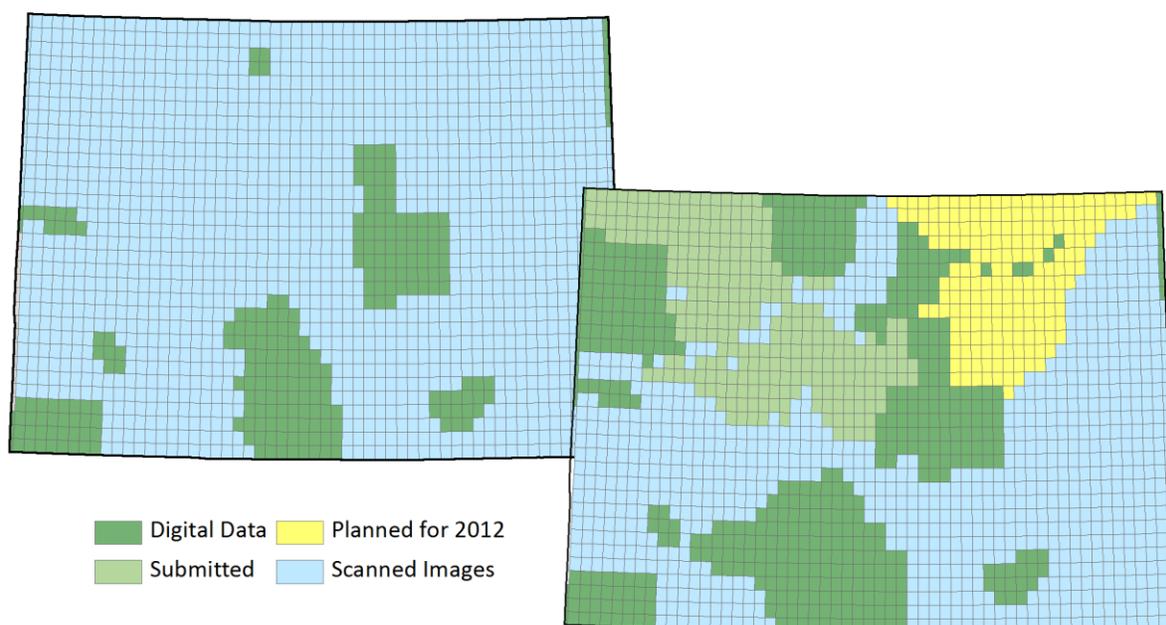


Figure 5. Status of NWI mapping for Colorado by quad. Map in upper left shows the availability of digital NWI mapping prior to 2008. Map in lower right shows current availability of digital NWI mapping, including quads recently submitted to NWI and quads planned for mapping in 2012.

Table 14. Acres of wetlands in Colorado mapped by NWI. Acreage represents wetlands only within areas of the state with digital mapping.

NWI Code	NWI System / Class	Common Name	Acres	% of Wetlands & Waterbodies	% of Wetlands (excl. Lakes & Rivers)
L1/2	Lacustrine	Lakes	95,898	10%	NA
R2/3/4	Riverine	Rivers	83,607	9%	NA
PUB/US	Palustrine Unconsolidated Bottom/Shore	Unvegetated Ponds/Shores	24,362	3%	3%
PAB	Palustrine Aquatic Bed	Vegetated Ponds	30,281	3%	4%
PEM	Palustrine Emergent	Herbaceous Wetlands	530,348	56%	69%
PSS	Palustrine Scrub-Shrub	Shrub Wetlands	164,105	17%	21%
PFO	Palustrine Forested	Forested Wetlands	15,260	2%	2%
Pf	Palustrine Farmed	Farmed Wetlands	413	<1%	<1%
Total Wetlands & Waterbodies			944,275	100%	NA
Total Wetlands (excl. Lakes & Rivers)			764,769	NA	100%

Rotating Basin Wetland Condition Assessments

EPA strongly recommends that each state monitor aquatic resources, including wetlands, using a probabilistic random sample design to make statistically valid statements about the condition of its resources. Funded by EPA Region 8 WPDGs, CNHP and CPW have partnered on a series of river basin scale wetland condition assessment projects. The objective of these projects is to provide quantitative information on the types, abundance, distribution, and condition of wetlands across Colorado. This information will be used to prioritize conservation funding through CPW’s Wetlands Program, in accordance with their newly updated strategic plan (Sullivan 2011). The first project was a pilot wetland condition assessment in the Rio Grande Headwaters River Basin, which took place from 2008–2011. The second was conducted in the North Platte River Basin from 2009–2011. The third will be conducted in the lower half of the South Platte River Basin from 2011–2013. Results from the Rio Grande Headwaters and North Platte River Basins are summarized here. Details can be found in final reports on CNHP’s website (www.cnhp.colostate.edu/download/reports.aspx).

CNHP and CPW plan to implement a rotating basin strategy for wetland condition assessments, beginning a new river basin study every one to two years depending on resource availability. For the purpose of these assessments, CNHP and CPW have defined ten major river basins within Colorado (Figure 5). The major river basins are modified from U.S. Geological Survey 6-digit hydrologic unit code (HUC6) basins, with smaller HUC6 basins merged with larger HUC6 basins where practical. These major river basins are similar, but not identical, to the major river basins used by WQCD for water quality reporting. For future surveys, CNHP and CPW will select river basins to study depending on partner agency interest.

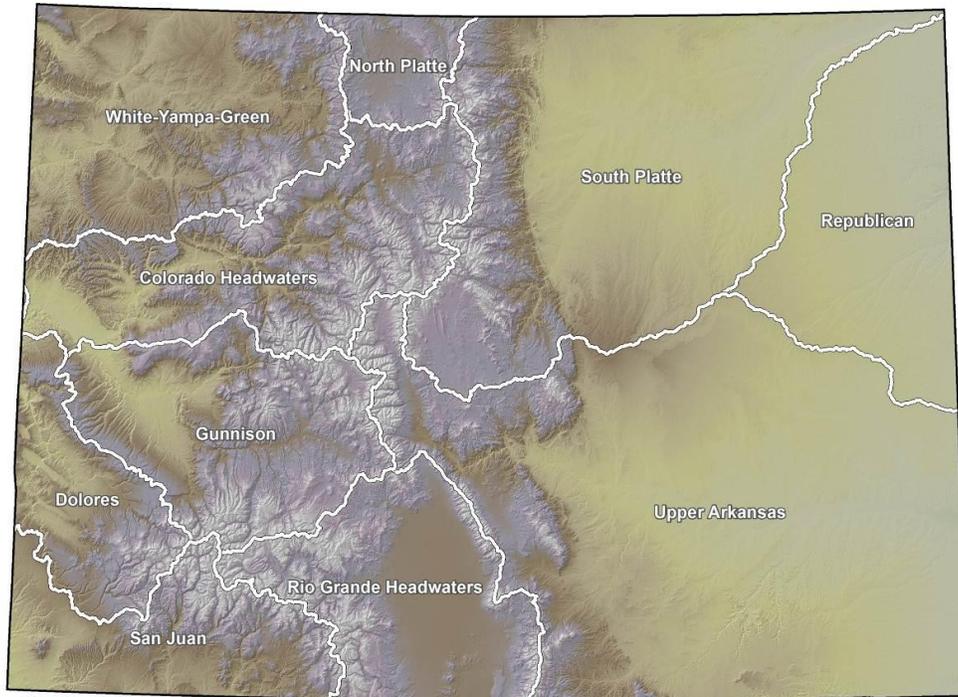


Figure 6. Major river basins used by CNHP and CPW for wetland condition assessment projects.

Protocols used in the rotating basin surveys have been developed by CNHP over the past 10 years with funding from EPA and CPW. The protocols follow EPA’s Level 1-2-3 framework² for wetland assessment and the Ecological Integrity Assessment (EIA) framework.³ Within EPA’s Level 1-2-3 framework, Level 1 assessments are broad in geographic scope, rely on GIS or remotely sense data, and are used to characterize resources across an entire landscape. Level 2 assessments are rapid, field-based assessments that evaluate the general condition of wetlands using a suite of easily collected and interpreted metrics. Level 3 assessments involve the most intensive, field-based protocols and are the most accurate measure of wetland condition.

The EIA Framework evaluates wetland condition based on a multi-metric index. Biotic and abiotic metrics were selected to measure the integrity of key wetland attributes (Table 15). Using field and GIS data, each metric is rated according to deviation from its natural range of variability, which is defined based on the current understanding of how wetlands function under reference conditions absent human disturbance. The farther a metric deviates from its natural range of variability, the lower the rating it receives. Numeric and narrative criteria define rating thresholds for each metric. Once metrics are rated, scores are rolled up into four major categories: 1) landscape context, 2) biotic condition, 3) hydrologic condition, and 4) physiochemical condition (Table 15). Ratings for these four categories are then rolled up into an overall EIA score. For ease of communication, category scores and the overall EIA score are converted to four ranks following the ranges shown in Table 16. See detailed reports for further explanation of data collection protocols and scoring formulas.

² For more information on EPA’s Level 1-2-3 framework, see www.epa.gov/owow/wetlands/pdf/techfram.pdf.

³ For more information on the EIA framework, see: www.natureserve.org/publications/EPA-Wetland-Mitigation.jsp.

EIA scores should not be interpreted as water quality standards and the results presented here are not analogous to WQCD's classified use attainment categories. The current EIA protocols do not include numeric criteria for any water quality parameters. EIA metrics related to water quality (sediment/turbidity and algal growth) are based on narrative criteria that have not been reviewed or approved by WQCD or the WQCC. Any establishment of biological or ecological water quality standards for wetlands would be coordinated through WQCD, with opportunity for public comment and approval by the WQCC. The results presented here describe wetland condition in a broad, ecological context and are useful for wetland conservation and management.

Similarly, the EIA method is not a functional assessment that measures the capacity of a wetland to perform specific functions (flood abatement, nutrient uptake, sediment retention, etc.). The EIA method is an ecologically based condition assessment that evaluates key biotic and abiotic attributes to indicate overall integrity. Condition assessments assume that a wetland with excellent integrity will perform all functions expected for its class or type at the full level, but do not measure those functions explicitly. Functional assessments, in contrast, evaluate structural attributes important to the delivery functions (e.g. measuring volume to determine potential for stormwater retention).



WETLAND, BASE OF BLANCA PEAK

Table 15. EIA metrics used for the Rio Grande Headwaters and North Platte River Basin wetland assessments.

Major Categories	Key Wetland Attributes	Metrics
Landscape Context	Buffer	Average Buffer Width and Extent Buffer Condition
	Landscape Connectivity	Percent Unfragmented Landscape Riparian Corridor Continuity ¹
Biotic Condition	Community Composition	Relative Cover Native Plant Species Absolute Cover Noxious Weeds Absolute Cover Aggressive Native Species Mean C ²
	Community structure	Regeneration of Native Woody Species ³ Interspersion of Structural Patches
Hydrologic Condition	Hydrology	Hydrologic Alteration ⁴ Upstream Water Retention ¹ Water Diversions / Additions ¹ Floodplain Interaction ¹ Bank Stability ¹ Beaver Activity ^{1,5}
Physiochemical Condition	Physiochemistry	Sediment / Turbidity Algal Growth Substrate / Soil Disturbance

¹ Metric recorded in Riverine HGM wetlands only.

² Mean C is a metric related to the floristic composition of the wetland. For more information, see Rocchio (2007).

³ Only applied to sites where woody species are naturally common.

⁴ Metric recorded in Non-Riverine HGM wetlands only.

⁵ Only applied to sites where beaver activity is expected.

Fun Fact: American Rivers once named the Animas River in southwestern Colorado one of the “most endangered rivers” in the United States and named La Poudre Pass Creek near Rocky Mountain National park one of the “most threatened rivers” in the United States.



Table 16. EIA score to rank conversion and interpretation.

EIA Score Range	EIA Rank	Interpretation of Score and Rank
4.5 – 5.0	A	Reference Condition (No or Minimal Human Impact): Wetland functions within the bounds of natural disturbance regimes. The surrounding landscape contains natural habitats that are essentially unfragmented with little to no stressors; vegetation structure and composition are within the natural range of variation, nonnative species are essentially absent, and a comprehensive set of key species are present; soil properties and hydrological functions are intact. Management should focus on preservation and protection.
3.5 – <4.5	B	Slight Deviation from Reference: Wetland predominantly functions within the bounds of natural disturbance regimes. The surrounding landscape contains largely natural habitats that are minimally fragmented with few stressors; vegetation structure and composition deviate slightly from the natural range of variation, nonnative species and noxious weeds are present in minor amounts, and most key species are present; soils properties and hydrology are only slightly altered. Management should focus on the prevention of further alteration.
2.5 – <3.5	C	Moderate Deviation from Reference: Wetland has a number of unfavorable characteristics. The surrounding landscape is moderately fragmented with several stressors; the vegetation structure and composition is somewhat outside the natural range of variation, nonnative species and noxious weeds may have a sizeable presence or moderately negative impacts, and many key species are absent; soil properties and hydrology are altered. Management would be needed to maintain or restore certain ecological attributes.
1.0 – <2.5	D	Significant Deviation from Reference: Wetland has severely altered characteristics. The surrounding landscape contains little natural habitat and is very fragmented; the vegetation structure and composition are well beyond their natural range of variation, nonnative species and noxious weeds exert a strong negative impact, and most key species are absent; soil properties and hydrology are severely altered. There may be little long term conservation value without restoration, and such restoration may be difficult or uncertain.

Prior to conducting field based assessments, all paper NWI maps were converted to digital data for both the Rio Grande Headwaters and North Platte River Basins. To efficiently sample wetlands across each study area, spatially balanced, probabilistic survey designs were developed. The Rio Grande Headwaters project employed a two-stage survey design. Target watersheds were selected in the first stage and target wetland sites were selected from NWI mapping within the target watersheds in the second. To stratify sampling across the basin, watersheds were grouped into six watershed strata (labeled A–F) based on a cluster analysis of environmental variables. Watershed strata were labeled from west to east across the basin, generally following the elevation gradient from the high San Juan Mountains (A) to the San Luis Valley (D and E), with the F stratum covering the Sangre de Cristo Mountains and foothills (Figure 7). Target watersheds were selected from these strata. The North Platte project, in contrast, used a one-stage survey design stratified by ecoregion (Figure 4; Omernik 1987). In the North Platte, wetland sites were randomly selected from NWI mapping within each ecoregion, proportional to the area of the basin occupied by that ecoregion. For the North Platte basin, where flood irrigated hay production occurs across a significant portion of the landscape, wetlands mapped as irrigated lands were removed from the survey design to focus the assessment on wetlands not actively managed as hay fields. In total, 137 wetland sites were sampled in the Rio Grande Headwaters (Figure 7) and 95 were sampled in the North Platte (Figure 8a).

For Level 1 assessments, detailed profiles of wetland acreage by type, water regime, ecoregion, and land ownership were prepared for each basin. For Level 2, wetlands were assessed in the field using the EIA protocol. For Level 3, a subset of sites in both basins was surveyed with intensive vegetation protocols. In the Rio Grande Headwaters pilot

project, not all target sites were visited, which limited the statistical inference that can be drawn from the results. However, EIA scores summarized by watershed strata, paired with the proportion of wetland acres each stratum contains, illustrate the range of wetland condition within the basin. For the North Platte project, survey design-based parameters were used to estimate the range of condition across all wetland acres within the basin.

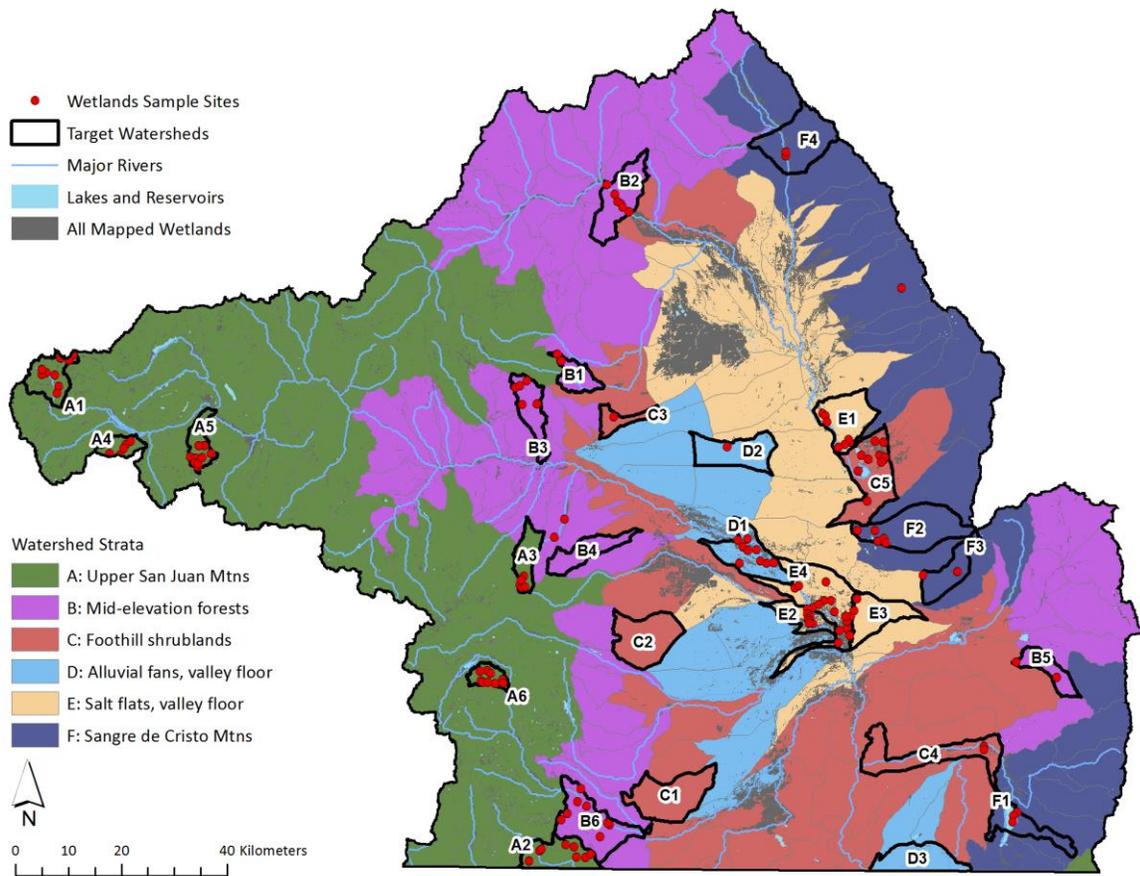


Figure 7. Watershed strata and randomly selected wetland sites sampled in the Rio Grande Headwaters River Basin

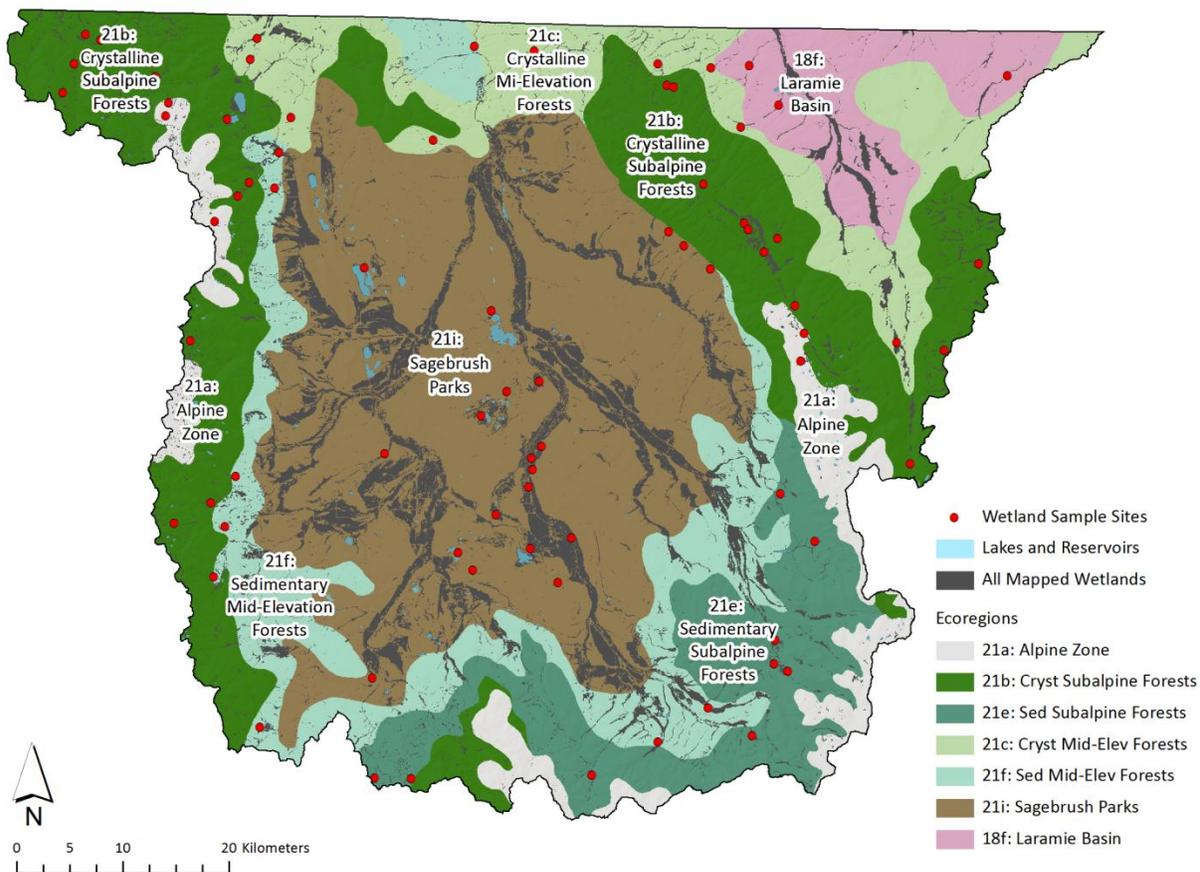


Figure 8a. Ecoregions and randomly selected wetland sites sampled in the North Platte River Basin. Eighteen sites sampled on private lands not shown.

Based on NWI mapping, there are 282,804 acres of wetlands and waterbodies in the Rio Grande Headwaters River Basin and 138,043 acres in the North Platte River Basin (Table 17). Excluding lakes and rivers, wetlands represent 6% of the land area in the Rio Grande and 10% of the North Platte. Wetland assessments were conducted in these basins because they are known to contain major wetland complexes and high priority wildlife habitat. Though mapping is not complete across the state, it is likely that wetlands comprise a smaller proportion of land area in other basins. Roughly one-third of the wetland area in the Rio Grande is mapped as irrigated lands, while over half the wetland area in North Platte is mapped as irrigated. Irrigated wetlands in active hay production were included in the Rio Grande Headwaters field assessment, but excluded from the North Platte field assessment.

NWI Wetland Type	Acres Mapped	
	Rio Grande Headwaters	North Platte
Lakes	11,607	5,046
Rivers	5,826	1,355
Unvegetated Ponds/Shores	1,738	991
Vegetated Ponds	5,490	3,321
Herbaceous Wetlands	236,553	100,880
Shrub Wetlands	20,111	26,171
Forested Wetlands	1,478	280
Total Acres of Wetlands and Waterbodies	282,804	138,043
Total Acres of Wetlands (excl. Lakes & Rivers)	265,371	131,642
Total Acres within the Basin	4,830,001	1,289,532
Percent of the Basin Mapped as Wetland	6%	10%
Percent of Wetlands Mapped as Irrigated ¹	33%	57%

¹Irrigated lands from Colorado Decision Support System (CDSS 2009).

From field survey results, 19% of wetlands sampled in the Rio Grande received an overall EIA rank of A, 30% received a B, 41% received a C, and 10% received a D (Table 18; Figure 8). A strong elevation and geographic trend is evident in the ranks. The highest EIA ranks occurred in the mountains (A and B watersheds), with lower scores in the foothills and on the valley floor (C, D, and E watersheds). The elevation gradient is also strongly tied to land use patterns in the basin, as is the case throughout Colorado. Proportional to the wetland area they contain, the A and B watersheds were oversampled. If sampling had been proportional, EIA ranks for all wetland area across the basin would likely include more low scores.

Table 17. EIA ranks for sampled wetlands in the Rio Grande Headwaters River Basin by watershed strata. See Figure 3 for watershed strata definitions.

Watershed Strata	A	B	C	D	Total	% of Wetlands Sampled	% of Mapped Wetland Area
A	25	16	4	-	45	33%	18%
B	1	15	7	2	25	18%	6%
C	-	5	7	1	13	9%	20%
D	-	1	8	1	10	7%	11%
E	-	1	22	8	31	23%	37%
F	-	3	8	2	13	9%	7%
Total	26	41	56	14	137	100%	100%
% of Sites	19%	30%	41%	10%	100%	NA	NA

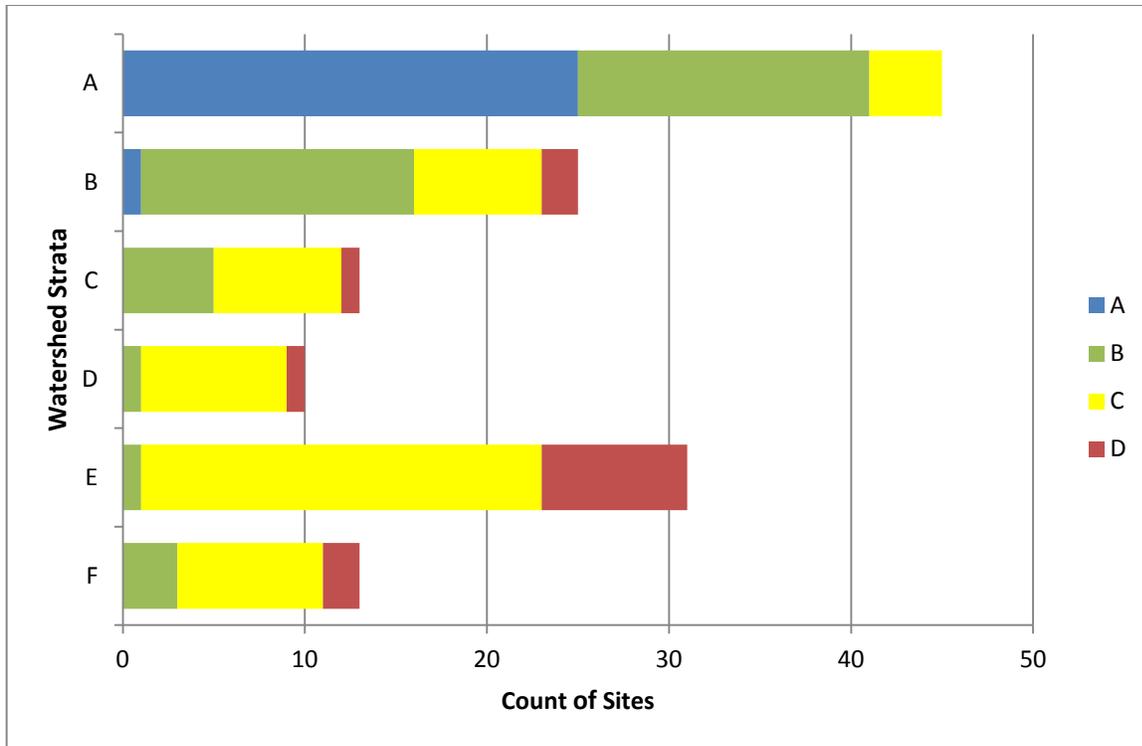


Figure 8b. EIA ranks for sampled wetlands in the Rio Grande Headwaters River Basin by watershed strata. See Figure 7 for watershed strata definitions.

In the North Platte, 45% of sites received an A rank, 42% received a B, 13% received a C and no wetlands received a D (Table 19; Figure 9). Overall scores were higher in the North Platte River Basin, which is less populated and has less intensive land use than the Rio Grande. However, the same elevation and land use gradient is evident in the North Platte. Sites in the alpine and subalpine ecoregions scored higher than sites in the central North Park valley. In the North Platte study, survey design parameters were used to extrapolate results to all non-irrigated wetland area in the basin with 95% confidence. Extrapolated results indicate that 34% of all wetland area in the basin would receive an A rank, 48% would receive a B, and 17% would receive a C (Figure 10).

Table 18. EIA ranks for sampled wetlands in the North Platte River Basin by ecoregion. See Figure 8 for ecoregion definitions.

Ecoregion	A	B	C	D	Total	% of Wetlands Sampled	% of Mapped Non-Irrigated Wetland Area
21a	5	-	-	-	5	5%	3%
21b	21	1	-	-	22	23%	19%
21e	6	3	-	-	9	9%	6%
21c	5	5	-	-	10	11%	7%
21f	5	7	-	-	12	13%	16%
21i	-	21	11	-	32	34%	44%
18f	1	3	1	-	5	5%	5%
Total	43	40	12	0	95	100%	100%
% of Sites	45%	42%	13%	0%	100%	NA	NA

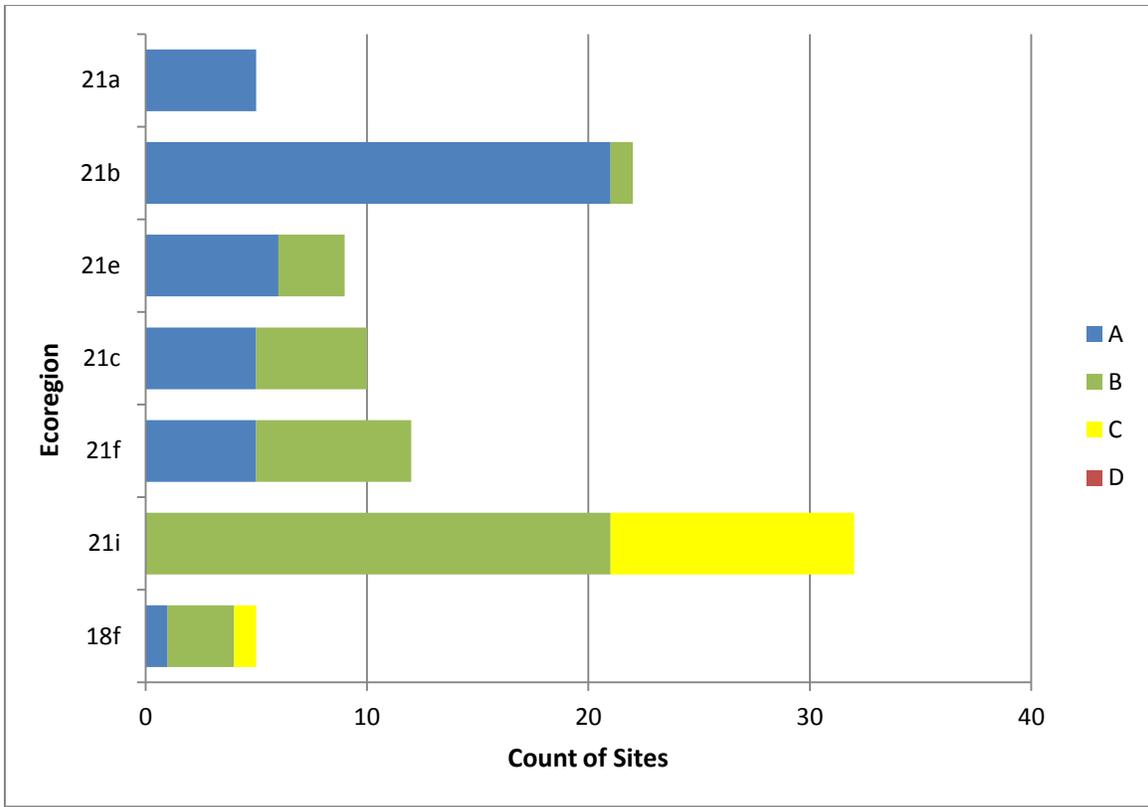


Figure 9. EIA ranks for sampled wetlands in the North Platte River Basin by ecoregion. See Figure 8 for ecoregion definitions.



DESCRIBING WETLAND SOIL PROPERTIES

Cummulative Distribution Function: Overall Site Scores

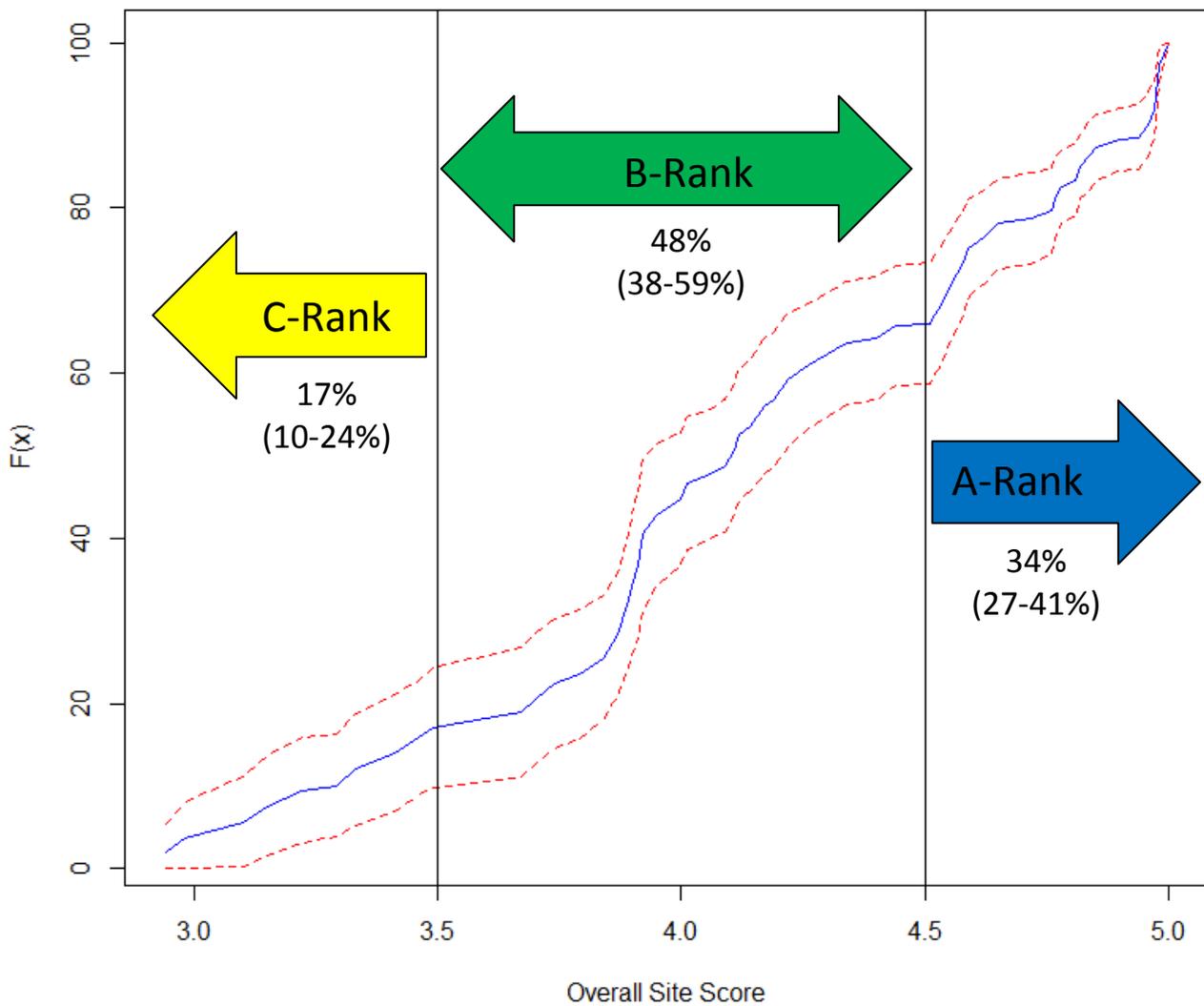


Figure 10. Cumulative distribution function of overall EIA scores and ranks for wetlands in the North Platte River Basin. Graph shows the cumulative proportion of wetland area (y axis) at or below a given EIA score (x axis). Blue solid line represents the estimate; red dashed lines represent the upper and lower 95% confidence limits.

Overall EIA scores and ranks were derived from category scores for landscape context, biotic condition, hydrologic condition, and physiochemical condition (Table 15). In general, scores were lower in the Rio Grande Headwaters than the North Platte River Basin. Most notable were differences in biotic and hydrology scores. The biotic condition category includes metrics related to vegetation composition, such as relative cover of native species, presence and cover of noxious weeds, and dominance of aggressive native species (cattails, red canary grass, etc.). In the Rio Grande, 30% of sites had no nonnative species at all and 59% of sites had less than 5% cover of nonnative species. In the North Platte, 36% had no nonnative species and 66% had less than 5% cover. Noxious weeds (as listed by the Colorado Department of Agriculture) were present in 34% of Rio Grande sites but only 21% of North Platte sites.

Twelve different noxious weed species were encountered in the Rio Grande study, while only four were encountered in the North Platte. Canada thistle was the most common noxious weed in both surveys. Aggressive native species, which can take over wetlands when high nutrient levels are present, dominated 8% of sites in the Rio Grande, but only 1% of sites in North Platte.

The hydrology category includes metrics related to water source, connectivity of water flow, and alteration of hydroperiod (frequency and duration of saturation). Water management is prevalent in both basins, as it is throughout Colorado. In the Rio Grande Headwaters, major diversions and canals move large quantities of water throughout the basin and groundwater pumping is extensive. In the North Platte, water management is more localized; smaller ditches and canals move water shorter distances for flood irrigation. Water management impacts on wetland hydrology are therefore less significant in the North Platte than the Rio Grande Headwaters.

Table 19. EIA category ranks assigned to wetlands in the Rio Grande Headwaters and North Platte River Basins, shown as the percent of all wetlands sampled in each basin.

	A	B	C	D
Landscape Context Rank				
Rio Grande	22%	47%	20%	12%
North Platte	56%	39%	4%	1%
Biotic Condition Rank				
Rio Grande	21%	15%	36%	27%
North Platte	37%	28%	28%	6%
Hydrology Rank				
Rio Grande	23%	26%	31%	20%
North Platte	48%	40%	9%	2%
Physiochemistry Rank				
Rio Grande	36%	56%	8%	-
North Platte	77%	22%	-	1%

Though scores and ranks were generally lower in the Rio Grande Headwaters River Basin than the North Platte River Basin, numerous wetlands in both basins received very high scores and are in nearly pristine condition. While CNHP and CPW continue to conduct river basin scale assessments, including the upcoming study of the lower South Platte River Basin, these results will be viewed in the context of the entire state of Colorado. Results from these and subsequent surveys will help CPW prioritize restoration and conservation funding

Participation in the National Wetland Condition Assessment

With the participation of numerous state agencies, tribes, and cooperators, EPA conducted field sampling for the first National Wetland Condition Assessment (NWCA) during the summer of 2011.⁴ NWCA was the fifth National Aquatic Resource Survey conducted by EPA to assess the condition of the nation’s waters. Prior to NWCA, EPA carried out similar surveys of the nation’s rivers, streams, lakes, and coastal areas. The purpose of NWCA was to assess the condition of the Nation’s wetlands by collecting data from 900 randomly selected wetlands within the

⁴ For more information on the NWCA, see: water.epa.gov/type/wetlands/assessment/survey/index.cfm.

lower 48 states. Data were collected on vegetation, soils, water quality, hydrology, and buffers within each targeted wetland. The survey employed a probabilistic random survey design that will allow the results to be extrapolated to all wetlands within the contiguous U.S.

The target population for NWCA included all tidal and nontidal wetlands of the contiguous U.S. with rooted vegetation and, when present, open water less than one meter deep. Certain farmed wetlands not currently in crop production were also sampled. The study used the broader USFWS definition of wetlands and, therefore, a wetland's jurisdictional status under state and federal regulatory programs did not affect a site's status as target.

Out of 900 randomly selected wetlands across the country, twelve were located in Colorado. A list of potential sample locations, including twelve primary sites and 36 oversample sites, was provided by EPA. Prior to field sampling, all potential sample sites were evaluated through a desktop screen and/or field reconnaissance to determine if the site met the study's target population. If a primary site did not fit within the target population, the site was replaced by the first site in the oversample list. For all sites on private property, landowner permission was obtained prior to sampling. If permission was not granted, the site was replaced by an oversample site. Applicable permits were also obtained for all sites located on public property. In addition to the random sites, four reference sites were selected in Colorado. Reference sites were handpicked wetlands known to be in good condition. Data from reference sites will help set condition thresholds for the randomly selected sites.

CNHP was contracted to carry out all site evaluation and field sampling due to its experience conducting wetland condition assessment projects. EPA provided field training in May 2011 and all members of the CNHP field team participated. Field work took place between June and September 2011 and followed EPA protocols. The four reference sites and all twelve randomly selected sites were sampled at least once during the summer (Figure 11). Two random sites were sampled twice to determine intra-annual variability. All field samples were shipped to cooperating laboratories for analysis and all data have been submitted to the EPA for processing. Data analysis will take place in 2012–2013, with a final report by 2014.



SAMPLING WETLAND VEGETATION, SAN LUIS VALLEY

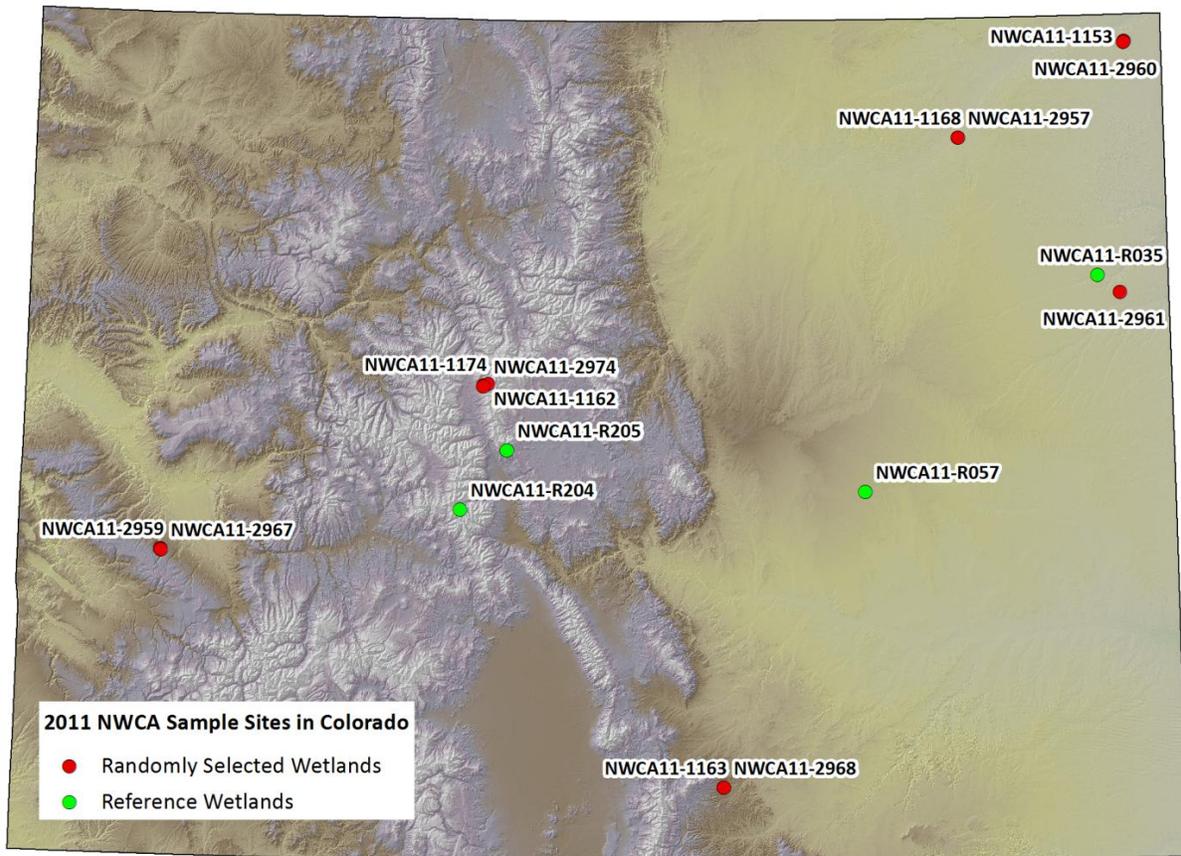


Figure 11: Wetlands sampled in Colorado through the NWCA. Several target sites occurred in neighboring pairs and appear as one site at the state scale.

Watershed Approach to Wetland Mitigation

Compensatory mitigation is required to offset wetland impacts permitted under Section 404 of the federal CWA. Out of concern that current mitigation practices are not sufficient to meet the national goal of no net loss of wetland acreage or function, the USACOE and EPA issued a federal rule to increase the effectiveness of mitigation (USACOE & EPA 2008). One of the key recommendations within the rule is for mitigation decisions to be made using a “watershed approach.” Several facets of the rule allow for interpretation at the USACOE district level, but the general approach involves: (a) building program partnerships, (b) setting watershed goals, and (c) using monitoring and assessment to inform decision-making based on the established goals.

Although it requires a watershed approach to mitigation, the rule does not provide guidance on how this should be implemented. Individual states and USACOE district offices are currently defining the watershed approach within their jurisdictions. Beginning in 2008, EPA convened a working group of interested parties to outline the use of a watershed approach in Colorado. The working group was comprised of staff from USACOE’s Omaha District, EPA Region 8 and Office of Research and Development (ORD), Colorado Department of Transportation (CDOT), CNHP, and Colorado State University (CSU). The working group prepared a training syllabus that describes an

assessment framework for compensatory mitigation and a series of factors that should be reviewed for a permit application under CWA Section 404. The syllabus was formally transmitted from EPA ORD to the Omaha District in June as a proposed approach. The review factors help determine whether the location and type of proposed mitigation is in line with policy directives under the watershed approach.

Stemming from the EPA-facilitated working group, CNHP and CSU were awarded a 2009 EPA Region 8 WPDG to continue developing Colorado's watershed approach. CDOT provided matching funds. Through the WPDG, CNHP and CSU are developing a detailed manual for applying the watershed approach in Colorado. This manual fully fleshes out the permit review factors and will be available by the end of 2012 for both regulators and developers to better plan mitigation projects that advance watershed goals.

Along with the manual, the CNHP and CSU team are carrying out a pilot project along the northern Front Range corridor to demonstrate how inventory and assessment data can be used to plan better mitigation projects (Figure 9). First and foremost, the watershed approach relies on an accounting of the current wetland extent within a project's watershed. However, Colorado lacks digital wetlands data for more than half the state. Within the pilot project area, CNHP updated NWI maps using 2009 aerial photography in order to calculate the current extent and distribution of wetlands and provide a baseline for watershed-level planning. In addition to wetland mapping, the condition of 34 randomly selected wetland sites was assessed during the summer of 2011 using two separate methods, CNHP's EIA method and the Functional Assessment of Colorado Wetlands (FACWet), which is now required for use with permit applications by the USACOE's Denver Office of the Omaha District. The results of these assessments will provide a detailed accounting of wetland resources along the Front Range and will help inform future mitigation decisions.

Additional Wetland Resources

In addition to the projects described above, CNHP and partners have received EPA Region 8 WPDGs for over 15 years. Many of these grants have funded surveys to document and monitor biologically significant wetland communities and populations of uncommon wetland plants and animals, most often at the county level. Data collected through these surveys are housed in CNHP's database, which contains thousands of records throughout Colorado and allows CNHP to track areas of high biodiversity significance.⁵

CNHP is also a leading resource of information on the identification and classification of wetlands in Colorado. In 2003, with EPA funding, CNHP produced the *Field Guide to the Wetland and Riparian Plant Associations of Colorado* (Carsey et al. 2003). This 466-page publication was based on field data collected by numerous wetland scientists over more than 10 years and describes 184 plant associations found across the state. CNHP is currently in the process of developing the *Field Guide to Wetland Plants of Colorado*. This full-color field resource will include botanical descriptions of ~500 wetlands plant species found across the state. In addition to descriptions, the guide will include photographs and line illustrations, diagnostic characteristics, tips for distinguishing between similar species, and information pertaining to wildlife use.

⁵ A map of counties surveyed by CNHP is available at: www.cnhp.colostate.edu/download/maps.asp#county_inventory.

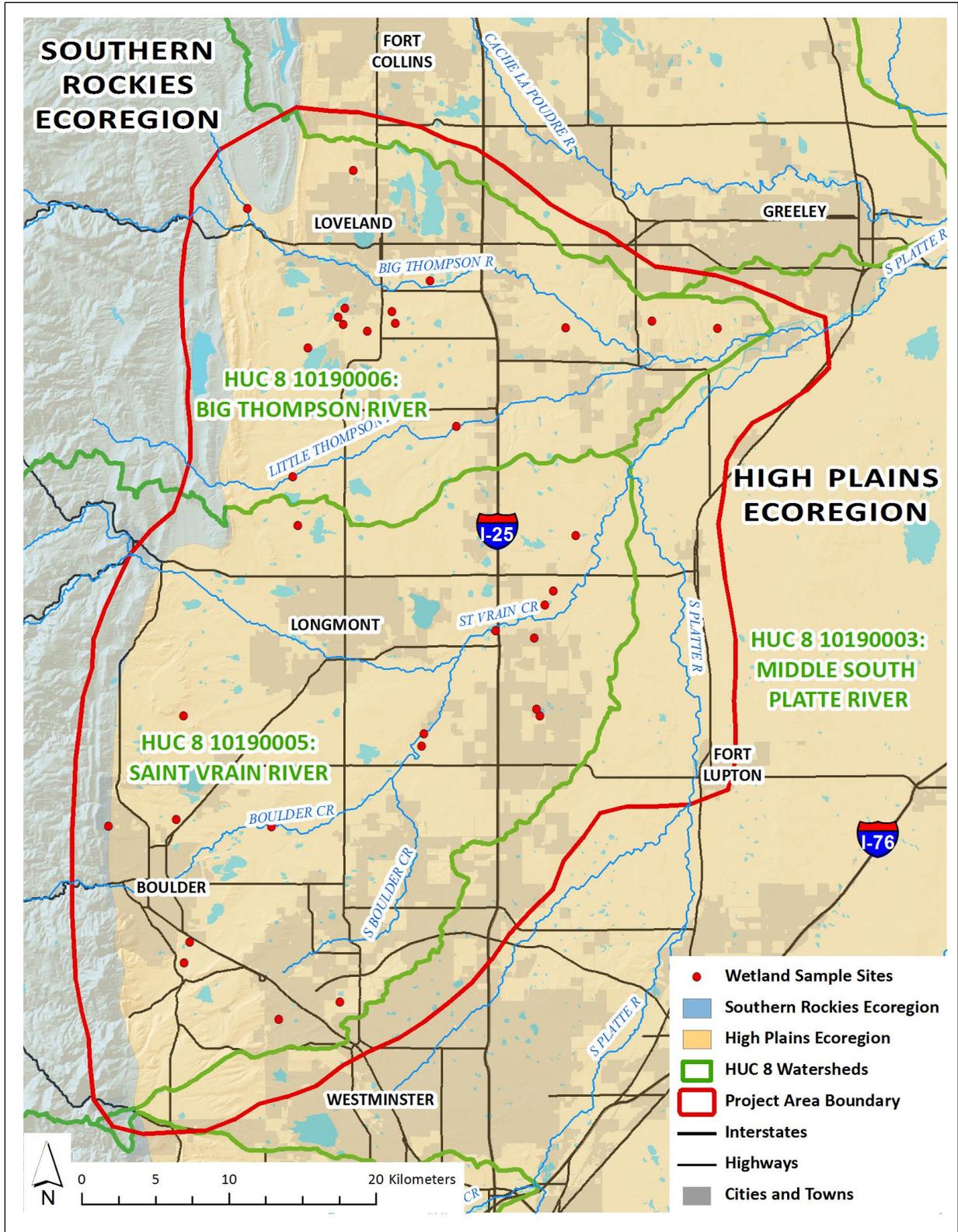


Figure 12. Front Range pilot project study area and location of wetland sites surveyed. The study area is bound to the west by the edge of the High Plains Ecoregion, to the south by HUC 8 10190005 (Saint Vrain River), to the north by HUC 8 10190006 (Big Thompson River), and to the east by Hwy 85 from Fort Lupton to Greeley.

Citations for Wetlands Section

Carsey, K. et al. (2003) Field Guide to the Wetland and Riparian Plant Associations of Colorado. Colorado Natural Heritage Program, Fort Collins, Colorado. Available online:

www.cnhp.colostate.edu/download/documents/2003/wetland_field_guide_2003.pdf.

Cowardin, L.M. et al. (1979) Classification of wetlands and deepwater habitats of the United States. *FWS/OBS-79/31*. US Fish and Wildlife Service, Department of the Interior, Washington, DC. Available online:

www.fws.gov/wetlands/documents/gNSDI/ClassificationWetlandsDeepwaterHabitatsUS.pdf.

CDDS (2009) Irrigated lands coverage for 2002. GIS layer created by the Colorado Decision Support Systems.

Available online: cdss.state.co.us/DNN/RioGrande/tabid/57/Default.aspx.

Dahl, T.E. (1990) Wetlands losses in the United States 1780s to 1980s. U.S. Department of the Interior, Fish and Wildlife Service, Washington D.C.

Omernik, J.M. (1987) Ecoregions of the conterminous United States. *Annals of the Association of American Geographers*, 77: 118–125.

Rocchio, J. (2007) Floristic quality assessment indices for Colorado plant communities. Colorado Natural Heritage Program, Colorado State University, Fort Collins, Colorado. Available online:

www.cnhp.colostate.edu/download/documents/2007/FQAFinalReport.pdf.

USACOE and EPA (2008) Compensatory mitigation for losses of aquatic resources. U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. *Federal Register* 73:19594–19705. Available online:

www.epa.gov/owow/wetlands/pdf/wetlands_mitigation_final_rule_4_10_08.pdf.

Sullivan, B. (2011) Statewide strategies for wetland and riparian conservation: Strategic plan for the Wetland Wildlife Conservation Program. Colorado Parks and Wildlife, Fort Collins, Colorado. Available online:

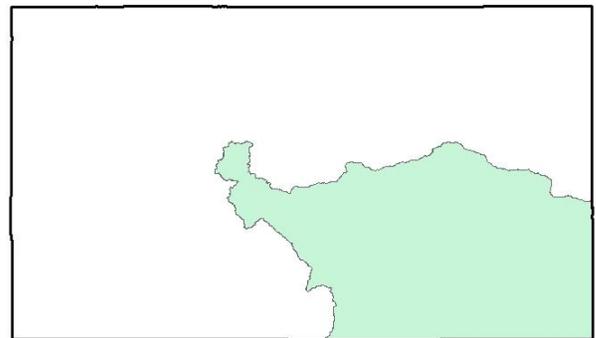
<http://wildlife.state.co.us/SiteCollectionDocuments/DOW/LandWater/WetlandsProgram/CDOWWetlandsProgramStrategicPlan110804.pdf>.

D. Use Support by Basin

This Section provides an overview of the beneficial use attainment by basin. There are 7 basin systems in Colorado based on the WQCC water quality standards basins : Arkansas, Upper Colorado and North Platte, San Juan and Dolores, Gunnison and Lower Dolores, Rio Grande, Lower Colorado, and South Platte.

Arkansas River Basin

The Arkansas River Basin includes waterbodies in the following counties: Lake, Chaffee, Custer, Fremont, El Paso, Pueblo, Huerfano, Las Animas, Otero, Bent, Prowers, Baca, Kiowa, Cheyenne, Lincoln, Teller, and Elbert. Major segments within the basin include: Arkansas River, Pueblo Reservoir, and Fountain Creek.



Assessment Results

For the Arkansas River Basin 28.9% of the river miles and 16.1% of the lake acres are fully supporting all classified uses. For lakes another 5.45% of acres are supporting at least some of the classified uses. The individual use support for the Arkansas Basin waterbodies is summarized in the following table (Table 20).

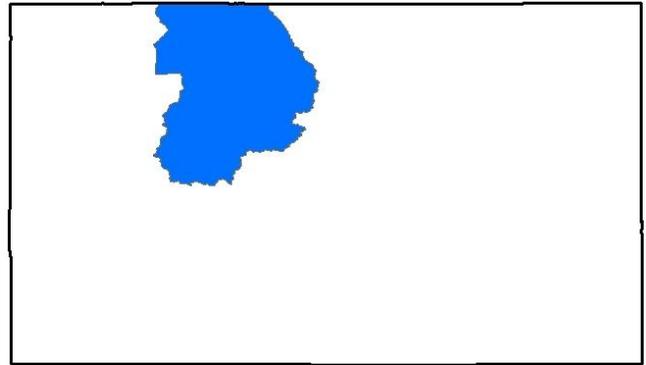
Table 20: Impairment Summary for the Arkansas River Basin		
EPA IR Category	River Miles	Lake Acres
1 - Fully Supporting	15,546	9,963
2 - Some Uses Supporting	791	2,592
3 - Insufficient Data, including waters on the M&E list	2,639	24,681
4a - TMDL Completed and Approved	224	0
4b - Impaired no TMDL Necessary	0	0
4c - Impaired Naturally, Placed on the M&E list	0	0
5 - Impaired and TMDL Necessary	2,735	32,797



PUEBLO RESERVOIR

Upper Colorado and North Platte Basin

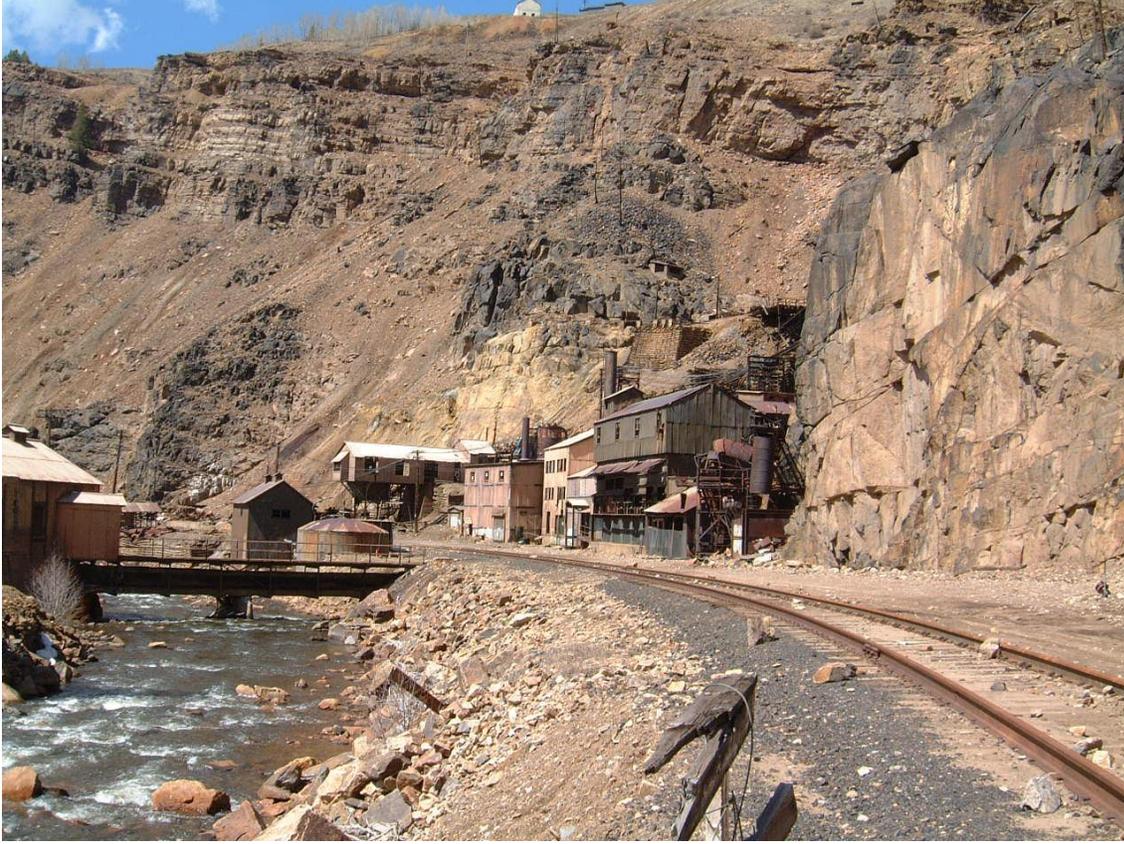
The Upper Colorado and North Platte basins include the Colorado River, the Yampa River and the North Platte River. The principal tributaries include the Fraser River, Blue River, Eagle River, Gore Creek, Roaring Fork, Snake and Little Snake Rivers. Major reservoirs in this basin include Dillion Reservoir, Grand Lake, and Lake Granby.



Assessment Results

For the Upper Colorado and North Platte basins 53.5% of the river miles are fully supporting all classified uses, with an additional 20% supporting at least one of the classified uses. For lakes within this Basin, 8.8% of the lake acres are fully supporting all classified uses, with an additional 20.5% supporting at least one of the classified uses. The individual use support for the Upper Colorado and North Platte Basin is summarized in the following table (Table 21).

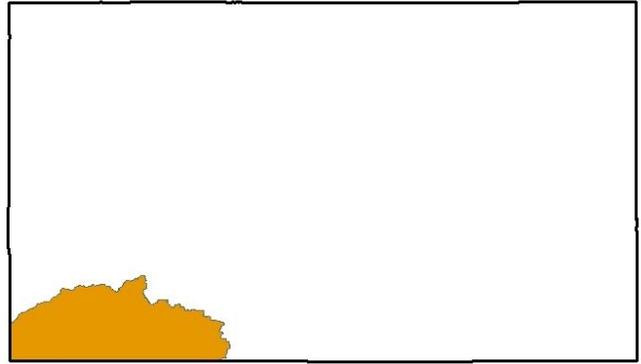
EPA IR Category	River Miles	Lake Acres
1 - Fully Supporting	9,062	11,347
2 - Some Uses Supporting	1,047	1,650
3 - Insufficient Data, including waters on the M&E list	236	18,370
4a – TMDL Completed and Approved	34	0
4b – Impaired no TMDL Necessary	2	0
4c - Impaired Naturally, Placed on the M&E list	0	0
5 - Impaired and TMDL Necessary	474	10,620



BELDEN MINE, EAGLE RIVER

San Juan River and Dolores River Basin

The San Juan and Dolores Rivers in southwestern Colorado are both tributary to the Colorado River. The principal tributaries of the San Juan River are the Animas, Florida, La Plata, Los Pinos, Mancos, and Piedra Rivers. The main tributary of the Dolores River is the San Miguel River. The San Juan River and tributaries pass through the Ute Mountain Indian Reservation and the Southern Ute Indian Reservation before exiting the state. The major population areas are Cortez, Durango, and Pagosa Springs. Major reservoirs in the San Juan basin include Ridgeway Reservoir, Mc Phee Reservoir, Vallecito Reservoir and Narraguinnep Reservoirj.



Assessment Results

For the San Juan River and Dolores River Basins, 42.2% of the river miles are fully supporting all classified uses. An additional 18.8% of the river miles are supporting at least one classified use. The individual use support is summarized in the following table.

Table 22: Impairment Summary for the San Juan River Basin and Dolores River Basins.

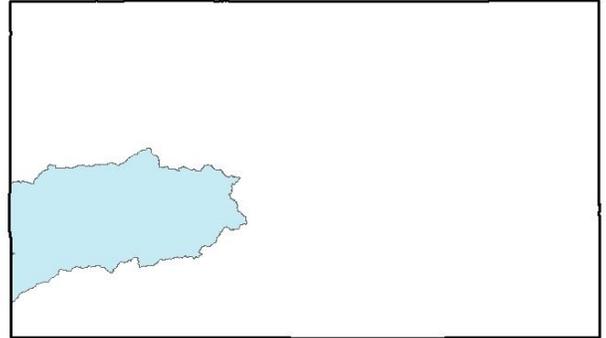
EPA IR Category	River Miles	Lake Acres
1 - Fully Supporting	2,936	1,654
2 - Some Uses Supporting	1,001	2,164
3 - Insufficient Data, including waters on the M&E list	1,975	9,384
4a – TMDL Completed and Approved	120	0
4b – Impaired no TMDL Necessary	0	0
4c - Impaired Naturally, Placed on the M&E list	0	0
5 - Impaired and TMDL Necessary	517	8,387



La Plata River

Gunnison and Lower Dolores River Basin

The Gunnison and Lower Dolores River Basin includes all or parts of Gunnison, Delta, Montrose, Ouray, Mesa, Saguache and Hinsdale Counties. Also included is the lower Dolores River and its tributaries in Dolores, Montrose, Mesa and San Miguel Counties. Major tributaries are the Gunnison River, Slate River, Uncompahgre River, San Miguel River, and the Lower Dolores River. Major reservoirs in the Colorado River basin include Blue Mesa Reservoir, Sweitzer Lake, Paonia Reservoir, Ridgway Reservoir and Fruitgrowers Reservoir.



Assessment Results

For the Gunnison and Lower Dolores River basin 48.8% of the river miles and 51.7% of the lake acres are fully supporting all uses. An additional 18.7% of the river miles, and 3.7% of the lake acres, are supporting some of the classified uses. The individual use support is summarized in the following table (Table 23).

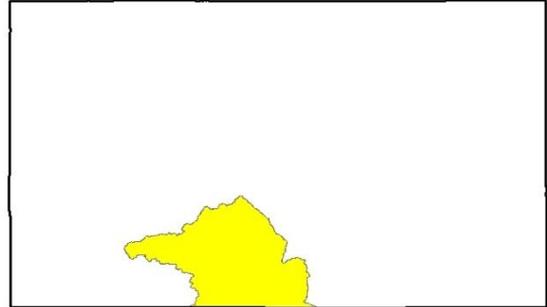
EPA IR Category	River Miles	Lake Acres
1 - Fully Supporting	6,148	17,380
2 - Some Uses Supporting	974	1,710
3 - Insufficient Data, including waters on the M&E list	1,464	5,268
4a – TMDL Completed and Approved	1,871	0
4b – Impaired no TMDL Necessary	0	0
4c - Impaired Naturally, Placed on the M&E list	0	0
5 - Impaired and TMDL Necessary	405	1,229



Ridgway Reservoir

Rio Grande Basin

The Rio Grande Basin is located in south-central Colorado, and covers 7,700 square miles. The basin ranges from above 14,000 feet above sea level in the Sangre de Cristo Mountains to 7,400 feet above sea level where the Rio Grande crosses the Colorado/New Mexico border. The principal tributaries of the Rio Grande are the Alamosa River and the Conejos River. Major reservoirs in the Rio Grande basin include Rio Grande Reservoir, La Jara Reservoir, Platoro Reservoir, Continental Reservoir, and the San Luis Lake.



Assessment Results

For the Rio Grande Basin 53.5% of the river miles are fully supporting all classified uses, with an additional 20% supporting at least one of the classified uses. For lakes within the Rio Grande Basin, 8.8% of the lake acres are fully supporting all classified uses, with an additional 20.5% supporting at least one of the classified uses. The individual use support for the Rio Grande Basin is summarized in the following table (Table 21).

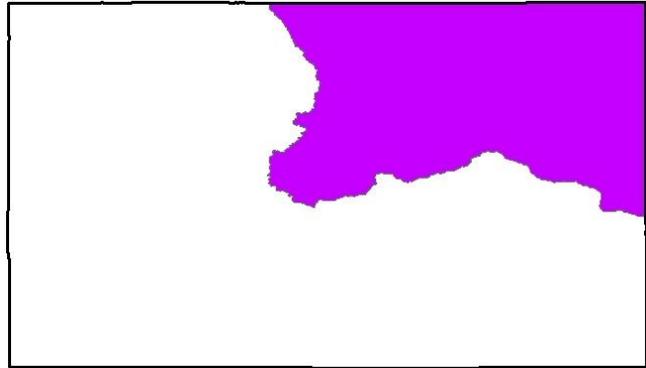
Table 24: Impairment Summary for the Rio Grande River Basin.		
EPA IR Category	River Miles	Lake Acres
1 - Fully Supporting	3,932	343
2 - Some Uses Supporting	286	2,046
3 - Insufficient Data, including waters on the M&E list	1,140	10,968
4a – TMDL Completed and Approved	147	0
4b – Impaired no TMDL Necessary	0	0
4c - Impaired Naturally, Placed on the M&E list	0	0
5 - Impaired and TMDL Necessary	152	3,280



Alamosa Canyon

South Platte River Basin

The Platte River Basin covers approximately 21,000 square miles in northeastern Colorado. The North and South Platte Rivers join in Nebraska to form the Platte River. The South Platte River has the largest population of any river basin in Colorado with almost 3 million people, or almost 70% of the state's population. The major tributaries of the South Platte are Bear Creek, Cherry Creek, Clear Creek, Boulder



Creek, St. Vrain River, Big Thompson River and the Cache La Poudre River. Major reservoirs in the Platte River basin include Cherry Creek Reservoir, Chatfield Reservoir, Barr Lake, and Horse Creek Reservoir.

Assessment Results

For the South Platte River Basin 32.4% of the river miles are fully supporting, with an additional 18.9% supporting at least some of the uses. Additionally, a further 32.7% of the lake acres are supporting at least some of the classified uses. The individual use support for the South Platte Basin is summarized in the following table (Table 25).

Table 25: Individual Use Summary for the South Platte River Basin.

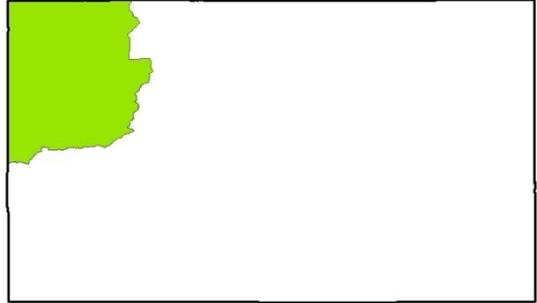
EPA IR Category	River Miles	Lake Acres
1 - Fully Supporting	7,042	19,248
2 - Some Uses Supporting	1,582	13,375
3 - Insufficient Data, including waters on the M&E list	10,214	68,410
4a – TMDL Completed and Approved	123	0
4b – Impaired no TMDL Necessary	0	0
4c - Impaired Naturally, Placed on the M&E list	0	0
5 - Impaired and TMDL Necessary	3,139	13,047



South Platte River, North Denver Colorado

Lower Colorado River Basin

The Lower Colorado River Basin covers all or parts of Garfield, Mesa, Rio Blanco, Moffat and Routt Counties. Major tributaries include the Lower Yampa River, Green River, Williams Fork River, White River, Yellow River, and the Lower Colorado River.



Assessment Results

For the Lower Colorado River Basin, 1.1% of the river miles are fully supporting 55.4% of all designated uses. The individual use support is summarized in the following table (Table 26).

Table 26: Individual Use Summary for the Lower Colorado River Basin.

EPA IR Category	River Miles	Lake Acres
1 - Fully Supporting	4,643	0
2 - Some Uses Supporting	3,990	23.3
3 - Insufficient Data, including waters on the M&E list	5,283	7,563
4a – TMDL Completed and Approved	0	0
4b – Impaired no TMDL Necessary	0	0
4c - Impaired Naturally, Placed on the M&E list	0	0
5 - Impaired and TMDL Necessary	2,125	553



Kayakers on the Lower Colorado River