Wyoming's 2006 305(b)
State Water Quality Assessment Report

and

2006 303(d) List
of Waters Requiring TMDLs

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Executive Summary

Wyoming's 2006 305(b) Water Quality Assessment Report (305(b) Report) presents a summary of water quality conditions in the state, as required by Section 305(b) of the Clean Water Act. Included in this report is Wyoming's 2006 303(d) List of Waters Requiring TMDLs (303(d) List).

EPA's guidance for the 2006 305(b) Report asks that the same assessment methodology be used for both the 305(b) Report and the 303(d) List, and that the methodology used is developed with opportunity for public comment. Wyoming began using the same methodology for both the 305(b) and 303(d) processes in 2000, using publicly reviewed methodology, which meets all requirements of Wyoming's "credible data" law. This methodology was updated and was made available for public comment along with the 2002 305(b) report and 303(d) List. This methodology was used to develop the 2004 305(b) Report and 303(d) List; and the 2006 305(b) Report and the 2006 303(d) List.

In addition, the guidance asks that all waters of the state be placed into one of five categories of use attainment, based on all available data.

1. All designated uses are met.
2. Some designated uses met, but unknown on others.
3. Insufficient data to determine if any designated uses are met.
4. Water is impaired or threatened but a TMDL is not needed.
5. TMDLs are needed. The 303(d) List.

The federal Section 305(b) guidance also requests that this report contain updates on programmatic changes and water quality issues in the state. Since the last 305(b) Report, Wyoming Department of Environmental Quality - Water Quality Division (DEQ) has continued to monitor ambient water quality as part of its comprehensive monitoring effort. Assessments on an additional 2319 miles of streams are included in this report. The booming coal bed methane (CBM) industry in Wyoming has generated a number of concerns regarding potential water quality impacts which are being addressed by DEQ.

The 2006 303(d) List is incorporated into three tables (Tables A, B & C) Table A is a list of waters with water quality impairments requiring a TMDL. There are 10 additional waters on table A: seven new listings, and three waters moved from Table C because further monitoring indicated use impairment. Two of the moved segments are not meeting their contact recreation use, and the other does not meet its aquatic life uses. Of the new listings, four waters have aquatic life use impairments, and the other three have contact recreation use impairments. Twenty-seven new waters were added to Table B, which are waters with waste load allocation discharge permits expiring, due to review of the Waste Load Allocations/TMDLs for the discharge permits. One water was added to Table C for threats to support of contact recreation uses. Thirty-three waters are delisted from the 2004 303(d) List: one from Table A due to TMDLs; twenty-five waters are delisted from Table B of the 2004 303(d) list due to EPA approval (or expected approval) of Waste Load Allocations/TMDLs or other factors affecting permitted discharges; one because of an improper listing on Table C; three because of changes to permits, discharges or classifications of receiving waters, and; three because of other environmental laws or controls addressing the pollutants. The delisted waters can be found on Table D.

Monitoring and Assessment

Water Quality Monitoring Strategy for 2004-2008

The purpose of this document is to outline the strategy WDEQ will use to monitor water quality across the State over a 5-yr period (2004-2008). The strategy was designed to address the water quality issues facing Wyoming, while also complying with requirements of the CWA and recent EPA guidance relating to the ten critical elements of a State water monitoring and assessment program. The monitoring strategy builds upon the previous monitoring plan in place from 1998 through 2002 by incorporating multiple new approaches that together will lead toward a more complete, comprehensive monitoring program that addresses all waters of the State. Key new pieces of the strategy include an increased focus on monitoring all water types, including lakes and wetlands, as well as a component that involves randomized selection of monitoring sites. The complete strategy document can be accessed at the following URL:
http://deq.state.wy.us/wqd/watershed/Downloads/Monitoring/4-0661doc.pdf

2004 and 2005 Monitoring Seasons

The five primary objectives for the 2004 and 2005 field seasons were:

1) Continue to collect supplemental data for streams and rivers where existing monitoring data is not sufficient for a conclusive determination of designated use support. The majority of these waters were originally monitored as part of the 1998-2002 plan;

2) Begin re-visiting historic reference stations, as well as identify new reference stations to fill spatial gaps in the statewide reference site coverage;

3) Begin sampling stations selected with a probability (random) survey design;

4) Sample streams receiving wastewater discharge under NPDES permits and with waste load allocations expiring in 2004 or 2005, and

5) Conduct reservoir monitoring on selected large reservoirs as part of new large reservoir sampling rotation.

Annual monitoring workplans list the specific streams, rivers, and reservoirs monitored during 2004 and 2005. These documents can be accessed at the following URLs:
http://deq.state.wy.us/wqd/watershed/Jeremy/2004workplan%20Jeremy.pdf
http://deq.state.wy.us/wqd/watershed/Downloads/Monitoring/2005workplan.pdf

Environmental Monitoring and Assessment Program

EPA is conducting the Environmental Monitoring and Assessment Program (EMAP) across the western United States, including Wyoming. The objectives of this project are to develop the monitoring tools (biological indicators, stream survey design, estimates of reference condition) necessary to produce unbiased estimates of the ecological condition of surface waters across large geographic areas of the west, and demonstrate those tools in a large scale assessment. Unbiased estimates require either a complete census of the ecological resource of interest (which is not practical) or a probability survey design that allows for extrapolation of monitoring results to the entire resource of interest. Such an approach will enhance the ability of the State to make unbiased statements about water quality and ecological condition at a much larger scale than is possible with the current design.

WDEQ has contracted the Wyoming District of the United States Geological Survey (USGS) to carry out this program in Wyoming. The USGS has completed the data collection phase, and is now in the data analysis and report writing phase. This project, including a final report for Wyoming, was originally expected to be completed by 2005, but delays in getting complete datasets have pushed the completion date back to mid-2006.

Statewide Water Quality Network

WDEQ sponsors USGS water quality sampling at 25 strategically located fixed stations across Wyoming. Sampling is conducted quarterly in most cases, with sampled parameters dependent upon suspected pollutants. Sites are used to identify problem areas, monitor trends in water quality condition, and for NPDES permitting and compliance uses.

Monitoring in Area of Coal Bed Methane Development

WDEQ is a partner in an interstate, interagency effort to monitor water quality and biological conditions in streams affected by coalbed methane development in NE Wyoming and SE Montana. In Wyoming, water quality is being monitored at 43 sites, while aquatic biological condition is being monitored at 26 sites. While designed to be a long-term monitoring program, the federal portion of the funding has not yet been secured to continue the work into 2006 and beyond.

Probability Monitoring

Section 305(b) of the CWA requires states to report on the condition of <u>all</u> waters of the State. Prior to 2004, Wyoming, like most states, had primarily monitored at targeted sites (mostly with suspected impairments) and therefore can only make scientifically defensible statements about the water quality condition of the waters at and near these sites. An estimate of statewide water quality conditions based on the targeted site data would be inherently biased. As a result, only a small percentage of the total waters of the State currently are reported as being assessed in the 305(b) report.

Currently, the only two approaches that will provide coverage of all waters of the State of Wyoming are: 1) a census of all waters, or 2) a probability survey. In the census approach every single water or stream segment within the State has to be visited and the condition measured. Obviously this is impossible. Probability surveys use a statistical approach (similar to opinion polls) to provide a cost-effective, scientifically-defensible alternative to periodically determine the condition of all waters. Using a subset of all waters, an estimate of the condition of all waters can be made along with a statement about the uncertainty surrounding the estimate. In a probability survey, a subset of waters is randomly selected (this ensures the "representativeness" or unbiased nature of the samples).

DEQ has decided that an absolute minimum of 60 sites must be selected through a probability survey and sampled before estimates of water quality conditions can be made on a statewide basis with any degree of certainty. DEQ began implementing a probability survey in 2004. As of October 2005, DEQ has sampled 30 sites through use of a probability survey, and will select and sample a minimum of 15 to 20 sites per year using this approach for the foreseeable future.

Monitoring by Conservation Districts

Since 1998, Wyoming's Conservation Districts, with the guidance and leadership of local watershed steering committees, have taken the initiative to improve water quality throughout the state. All of Wyoming's 34 Conservation Districts are involved in water quality activities at some level, including monitoring the waters within their districts, developing watershed plans to address identified impairments and threats, and assisting

citizens to implement management practices to improve water quality (WACD, 2005).

Most watershed planning efforts are initiated in response to waters being listed on the 303(d) List of waters requiring TMDLs. Those waters being addressed by a local watershed planning effort are given a low priority for TMDL development, providing an opportunity for voluntary and incentive based implementation activities to improve water quality. The ultimate goal for watershed planning is to use local knowledge to determine actions needed to improve water quality and then implement them, in order to improve water quality and ultimately remove waters from the 303(d) list (WACD, 2005).

Data and information was requested from all 34 of Wyoming's conservation districts for this report. Those districts which provided data are mentioned under the "Summaries of Water Quality Conditions" section of this report. Further information on water quality monitoring and watershed planning by conservation districts can be found at http://www.conservewy.com/.

Wyoming's Method for Determining Water Quality Condition of Surface Water

Section 305(b) of the Clean Water Act requires the state to describe the condition of all waters of the State. In addition, Section 303(d) requires that the state develop a listing of all waters which are impaired and do not fully support existing or designated uses. Essentially, a water is deemed to be "impaired" or "non-supporting" if any narrative or numeric criteria are exceeded or designated uses are shown to be adversely affected by man's activities. Along with the 2002 305(b) Report and the 303(d) List, DEQ released "Wyoming's Method for Determining Water Quality Condition of Surface Waters" as a separate document for public comment. The purpose of this methodology document is to outline the criteria and decision-making processes employed by the department for the purpose of making determinations about the quality of surface waters of the state. This methodology was used to develop the 2004 305(b) Report and 303(d) List; and the 2006 305(b) Report and the 303(d) List. "Wyoming's Method for Determining Water Quality Condition of Surface Waters" is available at the DEQ-WQD Website http://deq.state.wy.us/wqd.htm.

Discussion of "Habitat Degradation"

Watershed assessment involves looking at the combination of chemical, physical, and biological conditions to determine stream "health." The endpoint for aquatic or stream health is the biological community, which is controlled by both chemical and physical processes. Most of the numeric criteria in Wyoming are based on chemistry, while most narrative criteria address physical and biological integrity. Chemical health is usually fairly easy to understand: too much (or in some cases, such as dissolved oxygen, too little) of a substance dissolved in the water can have deleterious effects on the biological community. Therefore, a healthy biological community thrives best in water with certain chemical characteristics. But how do physical attributes affect the stream and its biological community?

As healthy streams flow through different types of terrain, they exhibit certain characteristics which can generally be predicted based on climate, flow regimes, substrate, valley shape, gradient, and other landscape features. Perhaps the most important attribute common to healthy streams in any environment is stream stability. Although streams are always changing somewhat, a healthy stream is relatively stable from one year to the next, in all flow regimes, from floods to low flows or even no flows (BLM, 1998). Stable streams have the ability to transport sediment loads under bankfull (high flow) conditions without significant erosion or instream sediment deposition (Leopold & Maddock, 1953). Because of this stability, aquatic organisms can establish themselves without being eradicated by severe scouring from floods and/or without being smothered by excessive sediment deposition. A stable stream also has a variety of habitats and physical features which provide living space for more age groups and a greater diversity of fish and other aquatic organisms. From a water quality standpoint, a healthy stream will trap and remove sediment and nutrients in the flood plain and riparian area during high flows, which improves instream water quality for aquatic life, while benefiting riparian plants, which in turn benefit livestock and wildlife.

Not only does a stream in good physical condition benefit aquatic life, but it also reduces flood damage to adjacent property, and provides better sub-irrigation and production in valuable bottom lands. Because of the moisture holding capability of a healthy riparian system, peak flows are reduced and stream flow continues longer in the season, which is good for both aquatic life as well as users of the stream water.

Because these processes and effects are so interlinked, a physically degraded stream will nearly always exhibit more than one physical problem. For example, a stream with severely eroding banks will also usually be wider and shallower than a stream in good condition. Depending on the flow regime, it will also probably have areas of excessive instream sediment deposition as well as areas of high sediment transport, both of which do not allow many stable areas for aquatic life and less variety of aquatic habitat. These physical and habitat problems are often compounded because the stream can be more prone to developing anchor ice in the winter and can also have higher summer temperatures. Obviously the end result is a reduction in biological community integrity.

When DEQ conducts stream assessments, chemical, physical, and biological conditions are examined and compared with the ranges of conditions expected, based on a suite of reference streams with similar geology, flow regimes, substrate, valley shape, gradient, and other landscape features. If, using a weight of evidence approach, a stream without measured chemical problems has substantially degraded physical and habitat features, with a resulting degraded biological community, it is considered impaired for aquatic life due to physical degradation of the aquatic habitat. For the purposes of 305(b) reporting and the 303(d) listing process, the combination of those degraded physical and habitat conditions is summed up in the broad term "Habitat Degradation."

Although habitat degradation is not a pollutant, EPA feels that most habitat degradation that is seen in western streams is due to unbalanced sediment loading, and that sediment is a pollut**ant**. Therefore, those waters impaired or threatened by habitat degradation need to be listed on the 303(d) list, and not placed in Category 4C. Habitat degradation caused only by low flows (legal water withdraws) is considered pollut**ion** and those waters are not placed on the 303(d) List. Three waters with habitat degradation impacts due solely to low flows or flow alteration are discussed in the 2006 305(b) Report.

E. Coli as an Indicator of Fecal Contamination

Fecal coliform are a group of coliform bacteria which live in fecal material of warm-blooded animals, including humans. Traditionally, counting fecal coliform colony forming units (CFUs) has been the primary method to detect and quantify fecal contamination in water. *E. coli* is a subset of fecal coliform; it is just one of the bacteria that make up the fecal coliform group. Counts of fecal coliform and/or *E. coli* serve as more than just a means of quantification of fecal bacteria, they are also a surrogate measure of fecal waste, including viruses, antibiotic resistant pathogens, disease causing agents, and other human and animal pathogens in water. However, counts of *E. coli*, one of the bacteria that make the fecal coliform group, have been found to better indicate risk of illness to people exposed to contaminated water. EPA is recommending that states use criteria based on *E. coli*, rather than fecal coliform, in their standards for contact recreation uses.

Consequently, DEQ and several other entities in the state, have been sampling primarily for *E. coli* to quantify fecal contamination. Wyoming expects to transition to *E. coli* criteria in the next revision of its Water Quality Rules and Regulations for surface water standards. Meanwhile, because *E. coli* is a subset of fecal coliform, counts of *E. coli* are compared with the current fecal coliform criterion to determine contact recreation use support, when fecal coliform data are not available.

Studies show for *E. coli*, there is more than 75% probability that the geometric mean criterion is being exceeded during the 30 day period around when the single sample was collected (USEPA, 1986). Because bacteria concentrations are so variable, it is very likely (if not almost certain) that geometric means of data collected during different 30 day periods will be higher at times and lower at times. Therefore, the

probability that there will be exceedences of the criteria is even greater than 75%. This is why the USEPA recommends state and tribal water quality agencies not only evaluate use support on a geometric mean criteria, but also a contain a strategy when such an "upper percentile value" is exceeded. (USEPA, 2003) Because of the human health risks associated with high counts of fecal coliform and/or *E. coli*, DEQ has taken a proactive approach to listing waters with high counts of fecal coliform and/or *E. coli*. For instance, DEQ will list a water as fully supporting but threatened when individual samples exceed 400 cfu/100mL (twice the geometric mean criterion of 200 cfu/100 mL) when those samples were collected during "normal" conditions (not collected during runoff, unusual high flow events, or after upset of sewage or waste facilities) and there is insufficient sampling to calculate valid, 30 day or 24 hour geometric means. In a nutshell, those high counts indicate that there is human sewage and/or animal manure in the water, which represents a public health threat, so those waters are placed on the 303(d) List. In every case in Wyoming that has undergone subsequent thorough and well designed monitoring, fecal coliform has exceeded the geometric mean criterion and therefore the water is impaired for its contact recreation use. Whether the water is listed as threatened or impaired, DEQ encourages watershed groups to start immediate planning to address fecal contamination, rather than delaying obvious implementation measures while only monitoring to better quantify the fecal contamination problem.

Coal Bed Methane Development

The structural unit of the Powder River Basin, consisting of the hydrologic units of the Upper Cheyenne River, Upper Belle Fourche River, and most of the Little Powder River, Powder River, and Tongue River continues to experience increased Coal Bed Methane (CBM) activity. In addition, there continues to be expansion of coal mining operations in the structural unit of the Powder River Basin. The proposed CBM activities include 50,000 water and gas extraction wells and associated roads, pipelines, pumping stations, power lines, and other infrastructure to be constructed over a 20 to 30 year period.

CBM development is expanding into other areas of the state. Currently there is also limited CBM activity in the North Platte, Little Snake, Big Horn (Wind) River and Green River basins.

To produce the gas, operators must partially de-water the coal seam. The produced water is often of high enough water quality that it can be discharged to surface waters, and in some cases has been successfully used for irrigation, or for pond and wetland development. However, there are some water quality issues associated with these discharges:

1. The discharges are often to stream channels that are ephemeral. These discharges, if not controlled, can potentially result in accelerated erosion and sedimentation.

2. In some parts of the basin, the discharge water may be elevated in sodium to the point that it is not suitable for irrigation. If not managed carefully, it could result in sodic soils.

3. Downstream states have raised concerns about how the chemistry of this discharge water may affect their designated uses of the main stem water.

4. Long-term chronic effects of CBM water discharges on fisheries, aquatic life, and other designated uses are not well known.

Wyoming, Montana and South Dakota continue to cooperate in the development of CBM activities and to monitor the effects of these activities within the affected drainages. The cooperation between the state agencies provides assurance that Montana and South Dakota's downstream water uses will be protected while coal bed methane develops in the upper reaches of the drainages.

The cooperative effort recognizes that Wyoming can proceed with permitting additional CBM operations, but will do so in a cautious manner to protect downstream users of the affected drainages. The effort includes a comprehensive monitoring network, collection of real time monitoring data at the border, and periodic analysis of trends. It sets reaction levels, based primarily on salinity and the sodium absorption ratio (SAR), should unexplained changes be observed in the recorded history of the system. If reaction levels are reached at the border, the comprehensive monitoring network is used to reassess the system to determine if the upsets may be associated with CBM operations or some other source or anomaly. This comprehensive watershed monitoring and analysis program also helps the states develop a better understanding of the Powder River system and how it responds to the new CBM activity.

Wyoming continues to work cooperatively with Montana as they develop downstream TMDLs for the Powder and Tongue Rivers. These tools, along with the comprehensive monitoring data, will help shape continued cooperative understanding between the two states. The process allows Wyoming to issue additional permits and to renew existing permits in a manner that accounts for projected cumulative impacts to the Powder River system which can be verified with monitoring data. Wyoming encourages permittees to employ discharge management practices that will reduce potential adverse water quality impacts to the main stem Powder River, including such practices as consumptive use, storage, reinjection, etc.

All discharges to surface waters of the state from CBM operations require a state WYPDES permit. These permits set effluent limits that assure protection of designated uses of the water, which include the basic uses

for livestock, aquatic life and wildlife, and in many cases, higher uses for fish and public drinking water. The WYPDES program has also initiated a watershed based permitting approach that considers the cumulative impacts of CBM discharges within a specific watershed. The watershed permitting approach involves a stakeholder process that assists with the development of a permitting approach for the watershed. It is anticipated that it will take several years to implement watershed based permitting for all the watersheds in the Powder River Basin. More information on watershed based permitting can be found at http://deq.state.wy.us/wqd/CBM_watershed_permitting.asp.

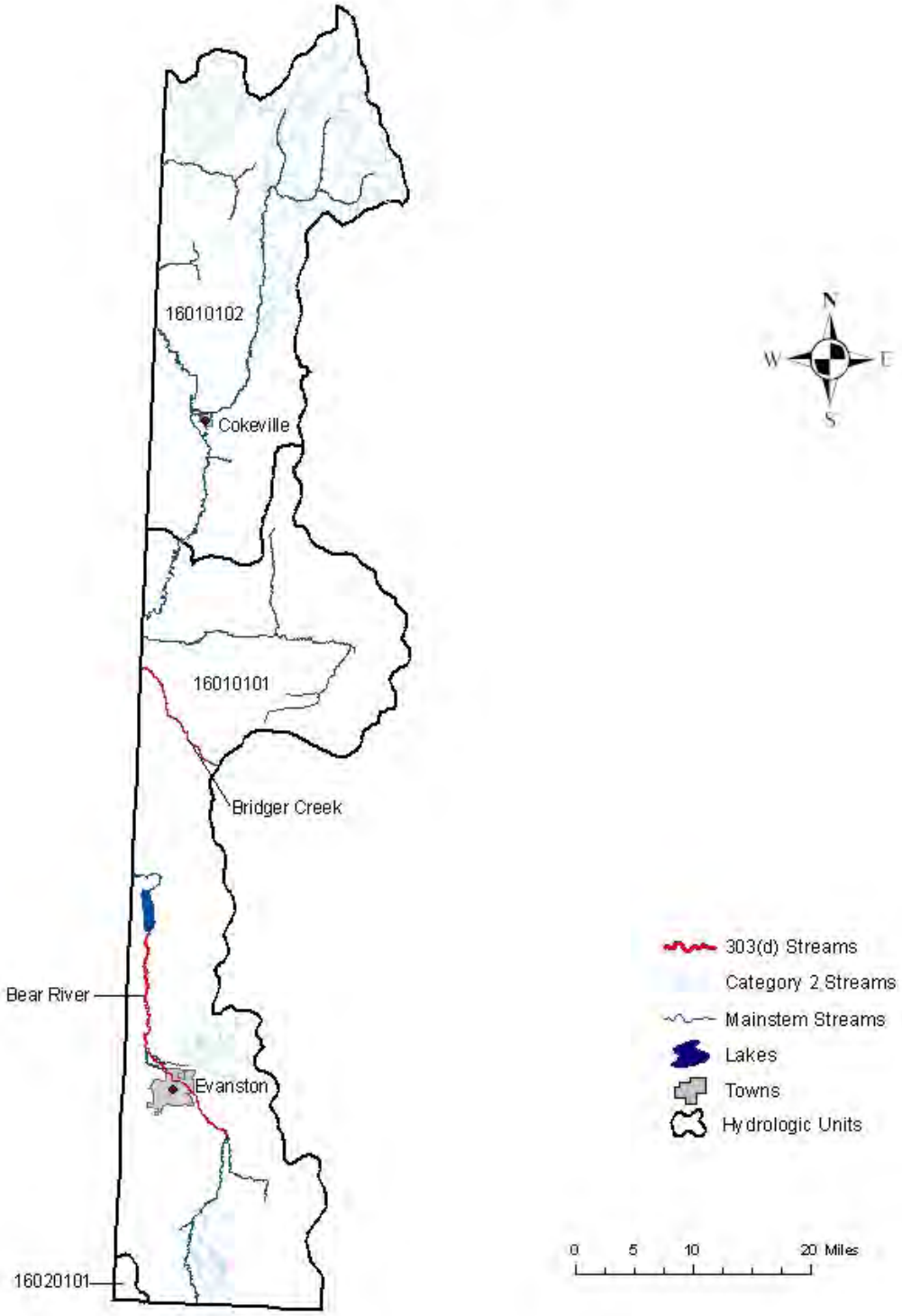
River Basin Descriptions and Summaries of Water Quality Conditions

The following sections describe the major river basins in Wyoming and summarize water quality conditions in each basin. Each basin section is preceded with a map that shows the major water and eight digit Hydrologic Units (HUCs), and highlights the approximate location of the impaired and threatened waters on the 2006 303(d) List. Each basin section is then subdivided into HUCs, referred to as sub-basins in this report. Water quality conditions, based on existing data and information, are discussed in each of these sub-basin sections.

Please note that only "credible data", as defined by Wyoming Law, has been used to make designated use support decisions. However, in much of this report, probable water quality conditions or concerns may be described, based on valid data and information, because DEQ has a responsibility to the public to describe what is known about water quality in Wyoming. We have attempted to clearly distinguish between the designated use decisions and probable water quality conditions in this report. Both use attainment and water quality conditions can change over time and this report was written based on the best available knowledge at this time. If you know of available data or information which can be used to better describe water quality conditions, please notify our 305(b) Coordinator, Mark Conrad, in writing at DEQ-WQD, 122 West 25th Street, Herschler Building 4-W, Cheyenne, WY 82002, fax (307) 777-5973 or email to mconra@state.wy.us.

Also, please note that the maps and highlighted 303(d) waters are not necessarily drawn to scale, and the beginning and end points of the water quality limited reaches may not be accurate. The highlighted reaches are only shown to give an approximate location within a river basin. Please refer to the location description in the 303(d) List to determine the extent of the reach, as well as existing data allows. Additionally, because streams are dynamic entities, and because the extent of water quality limitations varies over time, the exact location of water quality limitations often can only be approximated. As further sampling is conducted, the extent of water quality limitations can be better described. If you know of available data which can be used to better delineate these stream reaches, please let us know.

Bear River Basin



Bear River Basin

The Bear River originates in the Uinta Mountains of Utah and flows north into Wyoming. Below Evanston it is dammed at Woodruff Narrows, flows back into Utah, then re-enters Wyoming near Sage. It flows toward the north through Cokeville and then crosses into Idaho, near the community of Border. Water from the Bear River is diverted into Bear Lake (in Idaho and Utah) to increase storage capacity. Eventually the Bear River reaches the Great Salt Lake in Utah, making it the largest river in the western hemisphere without an ocean outlet.

Below Woodruff Narrows Reservoir the valley widens and water is extensively diverted and utilized for irrigation of alfalfa, pasture land and small grains. Bear River Basin streams are mostly perennial at higher elevations, but at lower elevations, stream flow in smaller streams is often intermittent or ephemeral. The basin contains many large reservoirs and hundreds of small stock ponds and reservoirs as well as extensive networks of irrigation canals.

The Bear River is apportioned among Idaho, Utah and Wyoming, under the interstate compact agreement of 1958 and amended in 1978. Many streams which were reportedly perennial in the past, now do not flow during some months (ERI, 1992; NRCS, 2001; USGS, 2004). This may be due in part to irrigation diversions, but channel down cutting, loss of riparian vegetation and damming of drainages are also possible causes. Many studies associated with the Bear River and its tributaries in Wyoming and Bear Lake in Utah have been completed and published.

In the Bear River Basin in Wyoming, much of the geology consists of fine-grained sedimentary formations which have been thrust faulted into steep, geologically young mountains which are easily eroded. As a result, surface waters have a high natural load of fine sediment, and often salts, carbonates, sulfates, and/or phosphate, which are found in the parent geologic material. Streams in much of the basin are highly dependent on vegetation for physical stabilization and are usually very sensitive to disturbance.

Two of the major water quality concerns in this basin are centered around the Bear River (Bonneville) cutthroat trout and the water quality of Bear Lake in Idaho and Utah. Historically, Bear River cutthroat trout were found throughout the Bear River Basin, but competition from non-native species, loss of aquatic habitat, and water quality changes have impacted the populations of these fish. The Bear River cutthroat trout was petitioned for listing under the Endangered Species Act as a threatened species throughout its range in 1998. In 2001, the U.S. Fish and Wildlife Service (USFWS) determined that listing was not warranted. It is the view of the Wyoming Game and Fish Department (WGFD) and of DEQ that the best and most economical ways to protect this species are through education, protecting and rehabilitating stream habitat, and reducing competition from unwanted introduced species.

Naturally high levels of calcium carbonate and historically crystal clear water in Bear Lake give it a very blue color. However, studies have shown that nutrient enrichment, and subsequent algal growth, has decreased the clarity of the water. In order to increase the range of Bear River cutthroat trout and improve the water quality in Bear Lake, numerous water quality studies and improvement projects have been conducted in the watershed, including in Wyoming. Both Idaho and Utah have written TMDLs for the Bear River.

The Upper Bear River Sub-basin (HUC 16010101)

In Wyoming this sub-basin includes those areas from the Twin Creek drainage upstream. Primary land uses are grazing in the uplands, irrigated hay and small grain production along valley bottoms, oil and gas production (including gas processing), and areas of historic phosphate and coal mining.

Water quality assessments conducted by DEQ on the Bear River in 1995, 1996, and 1998 indicate it is supporting its designated use as a cold water fishery above Sulphur Creek. DEQ also conducted monitoring on the Bear River below Sulphur Creek in 1998. Analysis of that data indicates that the Bear River, between

Sulphur Creek and Woodruff Narrows Reservoir, is only partially supporting its aquatic life uses due to instream sediment deposition. Additionally, much of this reach is channelized, which has resulted in a significant loss of trout habitat. This reach was added to Table A of the 303(d) List in 2002. Uinta County Conservation District has formed a watershed steering committee and has an approved watershed plan for the Bear River. The Bear River in and near Evanston is the site of a cooperative WGFD Riparian improvement project.

Assessments were also conducted by DEQ in 1998 and 1999 on Sulphur Creek, both above and below Sulphur Creek Reservoir. The data and information gathered as part of the assessment effort identified several stressors, including bank erosion, rapidly fluctuating flows below the reservoir, heavy riparian grazing, and seasonal low flows in the upper stream channel. The assessments confirm that Sulphur Creek is properly classified as a cold water fishery (Class 2AB), however, the data was insufficient to determine whether the physical and biotic condition was due to anthropogenic or natural stressors. Both segments were monitored again in 2003.

Oil has been produced in the Yellow Creek/Thief Creek drainage since the early 1900s and continues today. More recently, natural gas has been produced and processed, and grazing occurs throughout the drainage. Only the upper part of Thief Creek and some reaches of Yellow Creek are perennial. Soils in this drainage are highly susceptible to erosion and contain naturally high levels of calcium, magnesium, chloride, and sulfate. Streams are reported to be incised in these highly erodible and unstable geologic materials (ARE, 1983; ERI, 1985). The relative influence of natural and man caused activities cannot be determined at this time.

Streams in the Twin Creek drainage lie in highly erodible shales which contribute carbonates, salts, and metals to the streams. Rock Creek and many of its tributaries are perennial, but Twin Creek itself is non-perennial above the Rock Creek tributary confluence. In the upper Twin Creek drainage, the only perennial tributary reach is in Clear Creek below a spring. Loss of perennial flows in upper Twin Creek since the 1970s is a reported resource concern (NRCS, 2001). Both the road and the railroad line, built along the Twin Creek main stem in the late 1800's, have encroached on the stream channel. Phosphate was mined in the drainage between 1910 and 1977. In addition, a phosphate mill (crushing, pulverizing and bagging) operated until about 1985, with ore imported from Idaho. An unstable tailings pile and many eroding spoils piles are associated with the mining area. AML completed reclamation on 140 acres in 2002-2003, and the final 225 acres are expected to be reclaimed by 2008. DEQ has conducted monitoring in the Twin Creek drainage, and initial data review indicates concerns with bank erosion and sediment loading. Additional data was collected in 2004.

Studies in the 1980s and early 1990s identified the Bridger Creek drainage as a significant contributor of both sediment and phosphates into the Bear River (ERI, 1992). In 1996, a 319 watershed improvement project was completed in Wyoming and Utah, which significantly reduced this loading to the river. In Wyoming, seven small detention reservoirs were rebuilt to reduce head cutting and a large gravel pit was incorporated into a sedimentation basin at the border. Additionally, grazing practices in the watershed were modified to improve riparian cover and vigor to stabilize stream banks. According to the BLM, these practices have also increased stream flows. Bridger Creek is on Table C of the 303(d) List due to threats to aquatic life use support within the drainage. Recent monitoring suggests that the changes in grazing management have resulted in full aquatic life use support (Class 3B), however data were not complete enough to make a use support decision, per Wyoming's "credible data" law. Further monitoring is scheduled for 2006. Because Bridger Creek is not protected as a higher quality stream, the threat is not a risk to human health, and because of the need for additional data, the priority for TMDL development is given a "low" priority.

Central Bear River Sub-basin (HUC 16010102)

This sub-basin contains those drainages in Wyoming below Twin Creek, including the Smiths Fork and upper Salt Creek/Thomas Fork drainages. Land uses include historic phosphate mining, grazing, irrigated agriculture, and a number of recreational activities on the Bridger-Teton National Forest and BLM lands.

Irrigated agriculture occurs at lower elevations, primarily along the main river and creek drainages throughout the sub-basin.

Primary land use along the main stem Smiths Fork is irrigated pasture and hayland, with year-round recreation, seasonal grazing, and some logging in the upper drainage. Channel straightening and willow removal, intended to increase productive acreage during the mid 1900s, are reported to have caused accelerated bank erosion and stream widening along much of the lower Smiths Fork. Steps are being taken to mitigate these impacts in places. A Smiths Fork Steering Committee has been formed to improve water quality, bank stability, and wildlife habitat by modifying grazing practices and controlled burns.

The Smithfork Allotment is a 90,937-acre cattle and sheep allotment located north and east of Cokeville, Wyoming. A major management concern on this allotment is the condition of riparian areas associated with streams and upland springs and seeps due to past grazing and other activities, which include chemical spraying of the riparian areas subsequently killing most of the willow populations in the late 60's and early 70's, and numerous sheep to cattle conversions. Under season-long grazing use, and with a lack of upland water sources, livestock tend to concentrate in riparian areas for virtually the entire growing season every year. Proper Functioning Condition Inventory Data collected by the BLM indicates that most of the streams are "functioning at risk" which means the riparian-wetland areas are in functional condition, but some resource attribute makes them susceptible to degradation. Some are in an upward trend and some are in a downward trend. The BLM released the Smithfork Allotment Management Plan in March 2005 that will provide grazing management practices that should improve riparian vegetation on stream corridors and upland spring sites which should then result in improved water quality for the Smiths and Thomas Fork Watersheds (BLM, 2005).

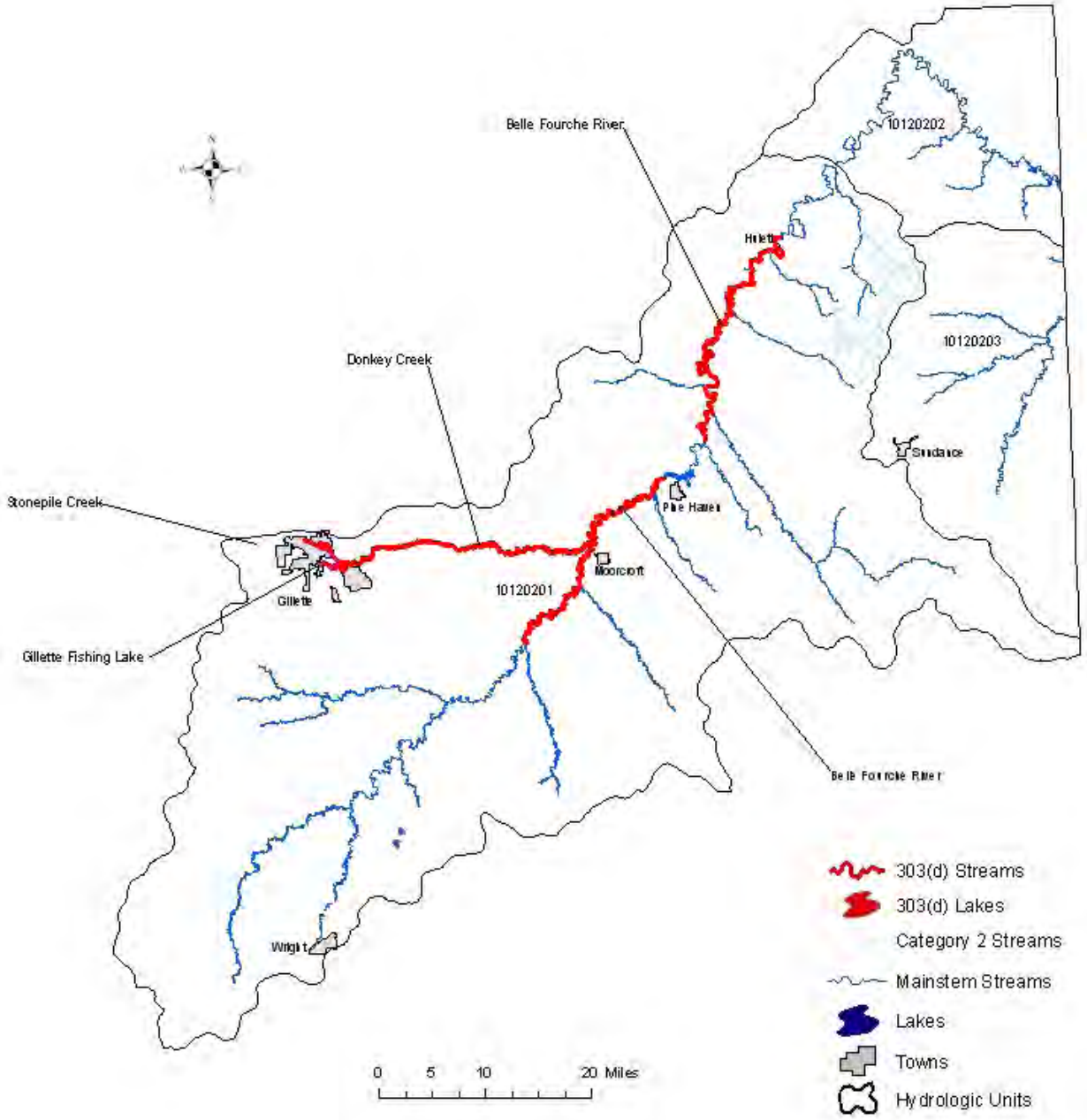
Water quality assessments conducted by DEQ in the Hobble Creek drainage, and the Smiths Fork drainage above North Smiths Fork indicate they are fully supporting their aquatic life uses.

Extremely low flows in the Bear River during the past several years of drought, apparently have contributed to elevated water temperatures near Cokeville.

Land ownership in the Salt Creek drainage, which flows into Idaho, where it is called the Thomas Fork, is primarily public with scattered small private holdings. Public lands are managed for multiple use, including recreation and grazing. Sediment and nutrients have been identified as possible water quality concerns in parts of this drainage, both in Idaho and Wyoming (ERI, 1992). Salt Creek has places with some unstable banks; much of which stems from the stream adjusting to the physical restrictions due to construction of the highway within the valley and from slumps and landslides in the unstable geology which have encroached on the stream. Results of monitoring conducted by DEQ on Salt Creek indicate stabilizing riparian conditions, and a fairly healthy macroinvertebrate community, however it is unclear whether the stream will support its cold water fisheries use during the summer months.

Giraffe Creek is a tributary to Salt Creek which originates in Idaho, then flows into Wyoming for a few miles before it joins with Salt Creek. DEQ assessment of Giraffe Creek indicates it is fully supporting its aquatic life uses in Wyoming.

Belle Fourche River Basin



Belle Fourche River Basin

The Belle Fourche River headwaters are in the plains south of Gillette. The river flows north-east, around the Bearlodge Mountains, then swings to the south-east and enters South Dakota. There are two distinct topographic regions: the rolling plains of the Powder River geologic basin in the west, and the Black Hills uplift in the east. Most streams originating in the plains are naturally intermittent, but discharges from coal mines, coal bed methane production, and the City of Gillette provide perennial flow in Donkey Creek, a portion of the Belle Fourche River and several other plains streams. Below Keyhole Reservoir, the Belle Fourche River has perennial flow due to reservoir releases as well as influences of perennial streams originating in the Black Hills. The Belle Fourche River Compact of 1943 regulates water rights in the Belle Fourche River Basin. Primary land uses in the basin are livestock grazing, hay production, and mineral extraction, including bentonite and coal mining, and oil, gas, and coal bed methane development.

Upper Belle Fourche Sub-basin (HUC 10120201)
The Upper Belle Fourche Sub-basin includes the drainages from Beaver Creek, north of Alva, upstream. Livestock grazing and hay production are the primary agricultural land uses. Coal mining and coal bed methane development are important land uses in the western portion of the sub-basin, and logging and recreation are other important land uses in the Black Hills.

Analysis of macroinvertebrate, chemical and physical data collected by DEQ indicates that the Belle Fourche River, from Keyhole Reservoir up to Raven Creek, is fully supporting its aquatic life and warm water fishery uses. However, two reaches of the Belle Fourche River are listed on Table A of the 303(d) List due to exceedences of the criteria for fecal coliform bacteria, indicating the contact recreation use is not supported. Monitoring by DEQ identified the extent of those reaches as from Keyhole Reservoir to an undetermined point above Rush Creek, and between Hulett and Arch Creek. The extent of the impairment downstream of the Town of Hulett is unknown. Crook County Conservation District has conducted further monitoring and has developed a watershed plan. Septic and animal feeding operation projects have been implemented in Crook County. For more information, see http://www.ccnrd.org/.

Gillette is the fourth largest community in Wyoming and lies at the upper end of the Donkey Creek drainage. Results of monitoring conducted by DEQ in 1998 indicate that Donkey Creek, from Stonepile Creek down to the Belle Fourche River, is impaired for human contact recreation by fecal coliform. Additional sampling by Campbell CCD confirm the impairment and also show the impairment extends above Stonepile Creek. The upper extent of the impaired reach of Donkey Creek, listed on Table A of the 303(d) List, has been extended to an undetermined distance above Antelope Butte Creek.

Stonepile Creek had been listed on Table C of the 303(d) List due to threats to its contact recreation use. Further sampling by Campbell CCD showed that Stonepile Creek does not fully support its contact recreation uses, therefore it has been moved from Table C to Table A of the 303(d) List. A watershed plan for the Donkey and Stonepile Creek watershed is in development (WACD, 2004). Implementation to address these fecal problems is focusing on septic system rehabilitation.

Assessment of Gillette Fishing Lake, conducted by Campbell CCD under a 205j grant, indicated impairments due to high amounts of sediment and phosphate coming from stormwater runoff. Gillette Fishing Lake is listed on Table A. Campbell CCD, in cooperation with the city, has developed a watershed plan to address the impairments on Gillette Fishing Lake (WACD, 2005). The City of Gillette has installed stormceptors and will be constructing a wetland to trap sediment and phosphorus from runoff before it reaches the lake. There are additional plans by the City to dredge Gillette Fishing Lake to remove sediment, as well as plans to install bank stabilization (WACD, 2002).

Monitoring conducted in the Black Hills by DEQ show full support of designated 2AB aquatic life uses in Blacktail Creek within Black Hills National Forest. Elevated water temperatures in Beaver Creek appear to be due primarily to historic channel widening caused by a combination of past grazing practices and changes

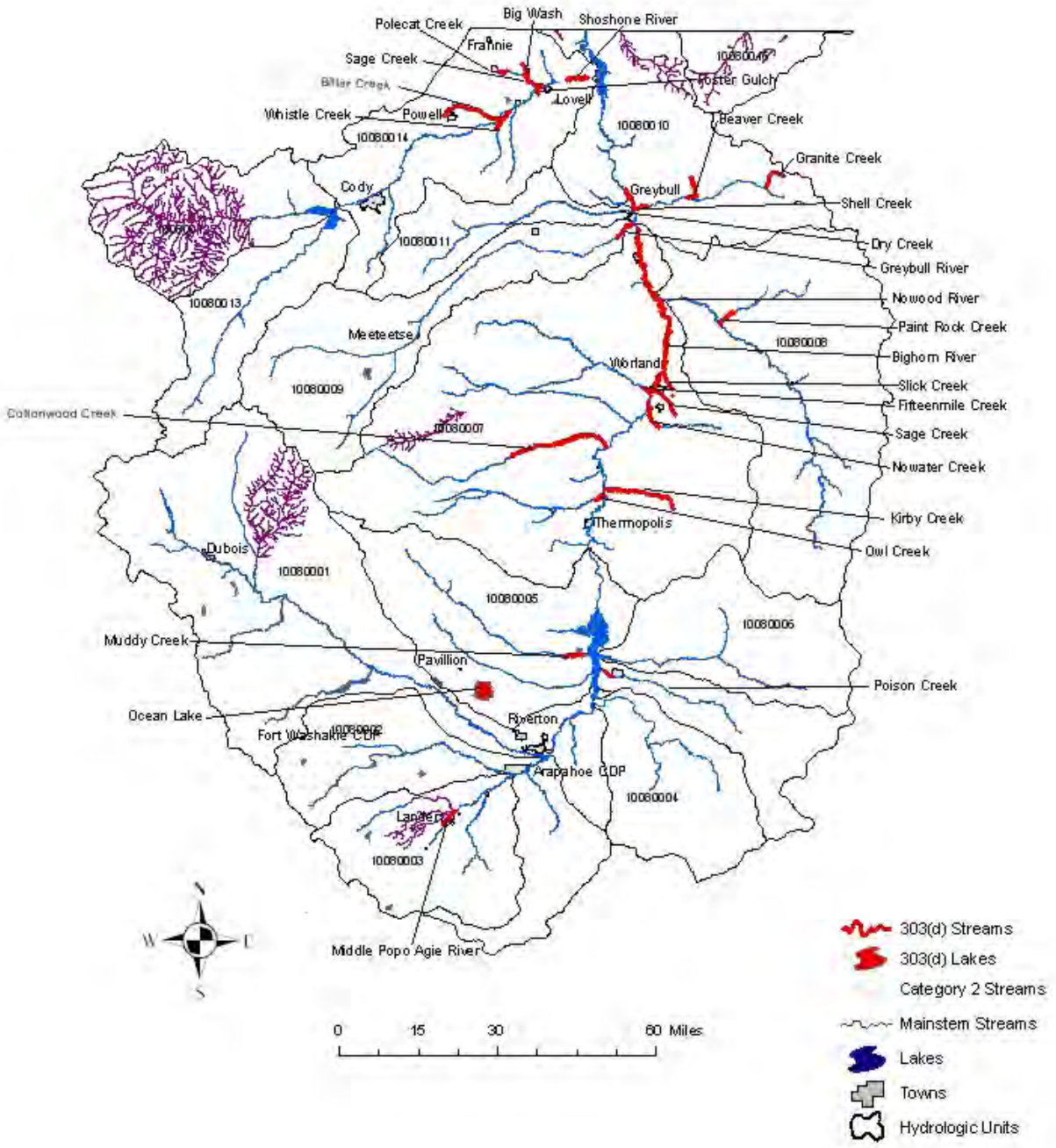
in flow regime from Cook Lake. The system has since stabilized, and is considered to be supportive of its designated class 2AB aquatic life uses. DEQ monitoring in this watershed also shows full aquatic life use support in several tributaries: Wood Canyon, Reservoir Gulch, Fawn Creek and Little Creek (3B), and in Cub Creek (2AB). A reach on Whitelaw Creek has been monitored by DEQ as a long term reference site since 1993. Extrapolation of those data and assessments to the remaining tributaries, indicate full aquatic life use support in the Beaver Creek watershed.

Lower Belle Fourche Sub-basin (HUC 10120202)
The Lower Belle Fourche Sub-basin includes the drainages entering the Belle Fourche River below Beaver Creek and above Redwater Creek. Logging, grazing, irrigated hay, and small grain production, recreation and bentonite mining are the primary land uses. It is not known if the contact recreation impairment seen in the Belle Fourche River in the Upper Belle Fourche Sub-basin continues into the sub-basin because of the absence of credible pathogen data.

Redwater Sub-basin (HUC 10120203)
The Redwater Sub-basin drains the eastern slope of the Bear Lodge Mountains before it joins the Belle Fourche in South Dakota. Logging, recreation, hay and livestock production are the primary land uses.

Sand Creek is protected as a Class 1 water. At Ranch A, springs discharge thousands of gallons of water per minute, and the stream below is considered a trophy trout fishery. DEQ has conducted monitoring on Sand Creek. Although a final report is not complete, the reach of Sand Creek extending a few miles below the springs appears to be supporting its aquatic life and fisheries uses.

Big Horn Basin



Big Horn River Basin

The Big Horn River Basin takes up a large portion of north-central Wyoming. For this report, the Basin includes the Wind River and all the other drainages into the Big Horn River in Wyoming, as well as the Little Big Horn River Sub-basin. The basin is bounded by the Absaroka Range on the west, the Wind River Mountains, Beaver Rim and Bridger Mountains on the southwest, south and southeast respectively, and the Big Horn Mountains on the east. As with any river basin, water quality is strongly influenced by geology and terrain. Natural water quality characteristics of streams coming off the Wind River Range and Big Horn Mountains are fairly similar due to relatively similar terrain, geology and climate. Water quality is generally good in these mountain ranges, but water quality gradually changes as streams flow across the basin to the Big Horn River due to natural erosion and stream processes increasing sediment and total dissolved solid (TDS) loads. Accelerated erosion, irrigated agriculture runoff, discharge from oil and gas development and other dischargers, and other human activities have the potential to degrade the water quality further (USGS, 1956; USGS, 1999).

Streams draining the Absaroka Range naturally carry very high sediment loads due to the easily eroded volcanic geology and relatively young mountains. Most of the lower portions of the Big Horn Basin have thin soils derived from highly erodible, saline, alkaline and/or phosphate-rich geologic materials. Additionally, much of the precipitation in the lower elevation portions of the basin (which typically receive less than 9 inches per year) emanates from thunderstorms, which tend to cause flash flooding and severe erosion of normally dry soils. Therefore, the Big Horn River naturally carries high sediment loads, but it is thought that human influences have increased the sediment loads. Man's influence on sediment transport in some of the lower elevation portions of the basin is believed to date to the 1880s, when a combination of old grazing practices (primarily long term with high densities of stock) removed the existing grasses and began a cycle of intense runoff and gullying which exacerbated naturally occurring existing conditions (Marston and Anderson, 1991). Construction of dams and other activities that modify the natural flow regime of the basin have also played a part (USGS, 1956; Bray, 1996). Recovery has been slow and difficult in the lower elevation, more arid parts of the basin.

Livestock grazing and irrigated hay production are the primary land uses in the basin. Large areas of the lower basin are irrigated to produce a variety of crops and small grains. Oil and natural gas are the basin's primary mineral resources, but bentonite, gypsum, and sand and gravel are mined in certain areas as well. Recreation is an important land use in most of the basin, and some logging occurs in the higher elevations.

Portions of the Upper Wind River and Little Wind River Sub-basins (HUCs 10080001 and 10080002) are within the Wind River Indian Reservation boundary.

Upper Wind Sub-basin (HUC 10080001)
The Upper Wind Sub-basin is the headwaters area for the Wind River, which flows into Boysen Reservoir. Land uses in the upper watersheds are primarily recreation, grazing, and timber production. Grazing, oil and gas production, and irrigated agriculture are primary land uses in the lower watersheds.

Limited *E. coli* sampling along the Wind River above the reservation boundary indicates that pathogens are a concern, so further monitoring will be conducted. The Dubois-Crowheart Conservation District (DCCD) has been sampling for water chemistry, as well as biological and physical parameters at several sites along the Upper Wind River and its tributaries, and completed a provisional report in 2004 (DCCD, 2004).

Habitat degradation has been documented by the Shoshone National Forest (SNF) on West Brooks Lake Creek, a small tributary to Brooks Lake. Because grazing management has been changed, monitoring by DEQ and the SNF will continue, to document improvement due to grazing management changes, and to determine the use support of this stream.

Both SNF and DEQ have conducted monitoring on the Wind River, Warm Springs Creek and a tributary, Trappers Creek. Results of that monitoring are inconclusive about support of aquatic life uses in the entire

watersheds, so further monitoring is being scheduled. Monitoring conducted by DEQ and SNF indicate that the East Fork of the Wind River above the Wiggins Fork and a tributary, Bear Creek, are fully supporting their aquatic life uses.

SNF has conducted stream stabilization work on the Wind River near the Tie Hack Memorial, and has worked with the grazing permittee to improve habitat and stream function.

Stabilization and revegetation work to control erosion and improve fish habitat in the Horse Creek drainage continues as a successful cooperative effort between SNF and WGFD. Monitoring conducted by DEQ and SNF indicate that portions of Horse Creek are in good physical condition, but further monitoring is needed to determine use support. Provisional data collected by DCCD indicate pathogens may be a concern in the lower watershed.

Little Wind Sub-basin (HUC 10080002)
The Little Wind Sub-basin includes those watersheds, other than the Popo Agie Sub-basin, which drain into the Little Wind River. Waters within the diminished reservation boundaries are not discussed or included in the report. Primary land uses are grazing, irrigated agriculture, and oil and gas production.

Many concerns have been identified with possible physical degradation along Beaver Creek, but BLM data shows physical conditions are generally improving. DEQ has conducted monitoring in this drainage, but a final assessment report has not been completed.

Popo Agie Sub-basin (HUC 10080003)
Headwaters of the Popo Agie Sub-basin are within the Shoshone National Forest. In the upper watersheds, recreation and livestock grazing are the primary land uses. Irrigated agriculture and residential development are the primary land uses in the Lander area.

The Middle Fork of the Popo Agie River near Lander is listed on Table A of the 303(d) List because of contact recreation impairment indicated by exceedences of the criteria for fecal coliform. The Popo Agie Conservation District (PACD) has developed a watershed plan to conduct further monitoring to identify sources of fecal contamination and voluntarily remediate them. As a consequence, the Middle Fork of the Popo Agie River is listed as a low priority for TMDL development.

A 319 watershed improvement project sponsored by PACD in the Squaw and Baldwin Creek drainages was reportedly very successful in rehabilitating physical degradation of the streams. Reports from that project suggest the streams in these drainages are supporting their aquatic life uses.

PACD has been conducting monitoring at 19 sites in the sub-basin since 1999 to assist with watershed planning efforts and to determine baseline and trend conditions (PACD, 2001; WACD, 2004; PACD, 2005).

Muskrat Creek Sub-basin (HUC 10080004)
The Muskrat Creek Sub-basin is in the Gas Hills area east of Riverton. Primary land uses are livestock grazing, oil and gas production and uranium production. Since 1990, AML has completed remediation of five former uranium mine sites; two additional sites had ongoing work in 1996-97. Data which could be used for an assessment are not available at this time. DEQ investigated Muskrat Creek in 1999 and found no flow in the creek. The Lower Wind River Conservation District has established a monitoring location on Muskrat Creek near its confluence with the Wind River as part of a Section 319 assessment project. The lack of flow in this watershed however, has prevented the collection of credible water quality data.

Lower Wind Sub-basin (HUC 10080005)
The Lower Wind Sub-basin is wing shaped - it includes the Muddy and Fivemile Creek drainages on the west side of Boysen Reservoir and the Poison Creek drainage on the east side. Primary land uses are grazing, irrigated agriculture, and oil and gas production. Flow from both the eastern and western drainages empties into Boysen Reservoir.

Ocean Lake was on Table C of the 303(d) List as threatened for supporting its aquatic life uses, due to physical degradation from irrigation return flows carrying sediment into the lake, which reduces aquatic life production. A watershed improvement project has been completed by the Lower Wind River Conservation District (LWRCD), which dramatically reduced the sediment loading to the lake. Monitoring conducted on Ocean Lake by DEQ and WGFD show that most of the irrigation drains in the watershed improvement project have reduced their sediment loads, but other areas in the watershed still contribute high sediment loads. There is also high nutrient loading into the lake. However, the primary problem in Ocean Lake is the excessive sediment that has already been deposited in the lake. Because Ocean Lake is so shallow, this sediment is constantly suspended by wave action and significantly reduces light infiltration, which could allow aquatic plants to grow and reduce suspension of sediment by wave action, so the problem continues to compound itself, and is further exacerbated by the high nutrient levels Fixes to Ocean Lake must not only reduce sediment loading, but must also involve stabilization of the sediment already in the lake. Additionally, the nutrient loading, and the existing nutrient load in the lake, both need to be reduced so that when the suspended sediment is reduced to increase light infiltration, algal growth doesn't reduce the clarity of the water. Because it is not fully supporting its aquatic life uses, Ocean Lake has been moved from Table C to Table A of the 303(d) List. The LWRCD has formally committed to developing a watershed plan to address issues at Ocean Lake. Because this impairment is not a human health issue and the commitment to conduct watershed planning, the priority for development of a TMDL on Ocean Lake is "low."

Poison and Muddy Creeks, tributaries to Boysen Reservoir, are on Table C of the 303(d) List, because analysis of USGS data indicate the contact recreation use on these streams is threatened due to occasional high counts of fecal coliform bacteria. LWRCD has collected *E. coli* data. Those provisional data were submitted to DEQ in January 2006, but they were not available for this report. A steering committee has begun the process of developing a watershed plan on Muddy Creek (WACD, 2005) with a formal commitment for that planning made in March 2006. A watershed planning effort on Muddy Creek, sponsored by LWRCD, has been recommended for Section 319 funding. The priority for TMDL development is currently "low" because of this watershed planning commitment. LWRCD has also made a formal commitment to develop a watershed plan on Poison Creek, resulting in this water receiving a "low" priority for TMDL development.

Badwater Creek Sub-basin (HUC 10080006)

The Badwater Creek Sub-basin is on the northeast side of Boysen Reservoir. Land uses are primarily livestock grazing and oil and gas production in the Lysite/Lost Cabin area. AML completed remediation of a mine site in the Hoodoo Creek drainage. LWRCD has established a monitoring location on Badwater Creek near its confluence with Boysen Reservoir as part of a Section 319 assessment project. The lack of flow in this watershed however, has resulted in limited collection of credible water quality data. The limited data collected, provisional at this time, suggest this watershed transports large amounts of sediment to Boysen Reservoir during runoff events.

Upper Big Horn Sub-basin (HUC 10080007)

Headwaters of the Upper Big Horn Sub-basin are in the southern end of the Absaroka Range and the Owl Creek and Bridger Mountains. Grazing and oil and gas extraction are the basic land uses, along with irrigated agriculture in the lower elevations. Several hundred acres in the Owl
Creek and Kirby Creek drainages have been mined for bentonite. Thermopolis Hot Springs contributes a naturally high TDS load to the Big Horn River, and also is the source of a natural temperature increase (Darton, 1906). Numerous watershed studies have been completed in the Fifteen Mile Creek drainage since the 1960's. These studies help provide information on potential natural vegetation, and responses of vegetation and stream morphology to different grazing strategies, that can be applied to much of the Big Horn Basin.

DEQ conducted monitoring on the Big Horn River and many other streams in 2001 to determine support of aquatic life uses, however, reports have not yet been completed. These streams include Owl, Kirby, Red Canyon, Lake, Buffalo, and Alkali Creeks.

The Big Horn River near Basin was placed on the 303(d) List in 2000 for impairment due to exceedences of

the criteria for fecal coliform bacteria. WDEQ conducted monitoring in 2000, which showed that the impaired reach extends from below the Greybull River (in HUC 10080010) upstream to the Nowood River. A number of homes and businesses in Manderson were found to be discharging largely untreated wastewater into the Nowood River, just above the Big Horn River. The Town of Manderson, working with the point source compliance program is developing a plan to remedy the situation. The plan is currently under review. Under the guidance of a local watershed steering committee formed in March 2001, the South Big Horn Conservation District (SBHCD) is scheduled to complete a watershed plan in 2006, and has collected fecal bacteria samples in the Big Horn River (WACD, 2004). Data from that monitoring are not available for this report.

Above the Nowood River, the Big Horn River is listed as threatened on Table C of the 303(d) List for contact recreation uses due to high levels of fecal coliform bacteria. Washakie County Conservation District (Washakie CCD) is pursuing watershed planning efforts within its district (WACD, 2005). Washakie CCD has collected *E. coli* samples in the Big Horn River upstream of the confluence with the Nowood River, but data from the monitoring to-date are not available for this report.

Owl Creek flows through fine grained sandstone, siltstone, and shales. Sodium and sulfate salts from these shales, together with silt and clay, naturally impact water quality (Ogle, 1992). In 1995, AML reclaimed a long-abandoned sulfur mine which had been affecting water quality in the Owl Creek watershed. Owl Creek is listed on Table C of the 303(d) List because analysis of USGS data indicate the contact recreation use is threatened due to occasional individual counts of fecal coliform more than twice the geometric mean criterion. Monitoring by DEQ in 2004 also showed high *E. coli* numbers in the lower reach of Owl Creek. Hot Springs Conservation District (HSCD) began monitoring for fecal coliform in July 2003, however those data were not available for this report. HSCD has sponsored the formation of the Owl Creek Watershed Planning Committee. This entity has made a formal commitment to initiate watershed planning in this watershed. As a result of this commitment, the priority for TMDL development on Owl Creek is "low."

Red Canyon Creek drains a watershed of easily eroded red soils developed from fine-grained red sandstone, siltstone, and shale. When the creek does flow, it delivers a distinctively colored sediment load to the Big Horn River. The relative influence of natural causes and development activities cannot be determined with available information.

Nowater, Sage, Fifteen Mile, and Slick Creeks, tributaries to the Big Horn River, are listed on Table C of the 303(d) List because analysis of USGS data indicate the contact recreation use on these streams is threatened due to occasional high counts of fecal coliform bacteria. Washakie County Conservation District (Washakie CCD) has received a 319 grant to conduct fecal bacteria monitoring and anticipates completion of a watershed plan in 2006 (WACD, 2004). Washakie CCD has collected *E. coli* samples in these creeks, but data from the monitoring to-date are not available for this report.

Extensive erosion has occurred in the Kirby Creek drainage due to a combination of channel manipulation, historic overgrazing, and responses to flow regime changes in the Big Horn River (Hurley, 2003; Bray, 1996). A 205j water quality assessment of the drainage, sponsored by HSCD, was completed and submitted to DEQ. The report identifies fecal bacteria as a problem in Kirby Creek, which has been placed on Table C of the 303(d) List. In addition, a USGS synoptic study included three sites on Kirby Creek. *E. coli* counts at each of these three locations exceeded 500 colonies per 100 ml. (USGS, 2003). A Coordinated Resource Management (CRM) group is addressing these problems in the Kirby Creek drainage, utilizing 319 and other moneys. HSCD currently sponsors a Kirby Creek steering committee and has a 319 implementation project in the Kirby Creek watershed to help address water quality concerns. Kirby Creek is a Class 2C water and the threat represents a human health risk. A formal commitment to develop a watershed plan on Kirby Creek was received from HSCD in March 2006. This formal commitment toward watershed planning results in the priority for TMDL development being set at "low."

Cottonwood Creek receives discharges from the Hamilton Dome Oil Field. Data collected in Cottonwood Creek below the discharges show exceedences of the water quality criteria for both chloride and selenium.

Therefore, Cottonwood Creek, below the discharges, has been added to Table A of the 303(d) List. Because the discharge water is used for irrigation and the oil field is an important part of the local economy, a Use Attainability Analysis (UAA) has been conducted on Cottonwood Creek. Site specific criteria of 43 ug/L of selenium and 860 mg/L of chloride have been proposed. Because of these proposed criteria changes, Cottonwood Creek is a low priority for TMDL development.

Grass Creek is a tributary to Cottonwood Creek. Assessment of DEQ monitoring data indicates that aquatic life uses are supported in the upper watershed, however, because legal flow depletions remove most, if not all the water down stream of the irrigation diversion in NENE Section 23, T46N, R99W, its aquatic life uses are correspondingly affected. This reach of Grass Creek is impacted by pollution, rather than a pollutant, and therefore does not require a TMDL.

Washakie CCD conducted monitoring in 1999 to determine aquatic life use support of Nowater Creek, Gooseberry Creek, Cottonwood Creek, and Fifteen Mile Creek. Data from that monitoring was submitted to DEQ, but was not sufficient to make use support determinations.

Nowood Sub-basin (HUC 10080008)
Headwaters of the Nowood Sub-basin are on the southwestern side of the Big Horn Mountains. Livestock grazing and oil and gas extraction are the major land uses in upper elevations. In lower elevations, irrigated agriculture is the primary land use and the largest consumptive water user. Bentonite is mined in Wild Horse Draw.

Fecal coliform samples collected by DEQ near the mouth of the Nowood River indicate an exceedence of that criterion, hence the Nowood River is not supporting its use for contact recreation. The impaired reach is listed on Table A of the 303(d) List as extending from the confluence with the Big Horn River upstream an undetermined distance. A number of homes and businesses in Manderson were found to be discharging untreated sewage into the Nowood River, just above the Big Horn River. A Notice of Violation has been issued by DEQ, and a plan to remedy the problem is under review. Washakie CCD conducted monitoring in 1999 on the Nowood River, Buffalo Creek, and Otter Creek to determine aquatic life use support, and submitted the data to DEQ. However, the data was not sufficient to make use support determinations.

Paintrock Creek, a tributary to the Nowood River, has been added to Table C of the 303(d) List because analysis of DEQ data indicate the contact recreation use is threatened due to occasional high counts of fecal coliform bacteria. SBHCD has a 319 grant and has collected samples on Paintrock Creek, however, data were not available for this report. Watershed planning efforts are underway on Paintrock Creek and the Nowood River (WACD, 2005).

Greybull Sub-basin (HUC 10080009)
Headwaters of the Greybull Sub-basin are in the Absaroka Range within the Shoshone National Forest. The foothills portions of the sub-basin are a mix of BLM, state, and private lands, and the basin portions are primarily BLM, with private lands adjacent to streams. The sub-basin has three major irrigation reservoir projects. Summer flows in the Greybull River at the confluence with the Big Horn River are reportedly almost entirely irrigation return water and at some times there may be minimal to no flow, due to appropriations on the river (RPO, 1979). Livestock grazing and areas of oil and gas extraction are major land uses, with irrigated agriculture nearby and adjacent to the major tributary streams.

The Greybull River is on Table A of the 303(d) list because exceedences of the criteria for fecal coliform bacteria at Greybull indicate it is not supporting its use for contact recreation. Although high fecal bacteria counts have been occasionally recorded as far upstream as Meeteetse, samples were collected too infrequently in upstream reaches to develop a valid geometric mean to compare with criteria. Meeteetse and South Big Horn Conservation Districts have monitored on the Greybull River. Analysis of their data indicate that the impairment may not extend above the Sheets Flat bridge, below Meeteetse. High water temperatures recorded during the recent drought raise concerns about the river's ability to support its use as a cold water fishery during low flows in summer. Future monitoring is required to better understand the

temperature regime and to determine sources of fecal bacteria. Watershed planning is occurring in both Big Horn and Park Counties.

Big Horn Lake Sub-basin (HUC 10080010)
The Big Horn Lake Sub-basin includes those areas, other than the Dry Creek and Shoshone River Sub-basins, which drain into the Big Horn River or Big Horn Lake below the Greybull River. Shell Creek is the largest watershed in the Big Horn Lake Sub-basin. Its upper reaches are sited on the western slope of the Big Horn Mountains within the Big Horn National Forest. It flows across National Forest, BLM, and private lands before it confluences with the Big Horn River. In lower elevations, the tributaries drain large areas of marine shales and other fine-grained geology, which produce naturally high TDS loading to the Big Horn River.

Bighorn Reservoir was created by the construction of Yellowtail Dam in Montana in 1963-67 for irrigation, power generation, and flood control. The upper third is in Wyoming; the lower two-thirds of the lake are in Montana. Livestock grazing and logging are the primary land uses, with bentonite mining on both sides of Shell Creek east of Greybull and also northeast of Spence. Gypsum is also mined in the area. The Porcupine Falls area in the Porcupine Creek Drainage is the site of a historic late 1800s-early 1900s placer and lode gold mining operation. Both mercury based amalgamation and potassium cyanide were used for gold extraction. In 1993, the Forest Service and Bureau of Reclamation began investigating reports that mercury from the historic mine was present in Porcupine Creek. However, sampling showed no mercury levels of concern. DEQ has also monitored Porcupine Creek, including mercury in fish tissue. Those data show that aquatic life and fish consumption uses are fully supported.

Both WGFD and the Montana Department of Health and Human Services have conducted fish tissue analysis of walleyes from Bighorn Reservoir, caught in their respective states. Mercury concentrations in the very largest walleyes from Montana caused them to post a fish consumption advisory. However, mercury concentrations in the Wyoming walleyes and the smaller walleyes from Montana were much lower. Wyoming does not have a fish consumption advisory for Bighorn Reservoir.

Fecal coliform monitoring on the Big Horn River below its confluence with the Greybull River indicate it is not supporting its contact recreation use, however, samples collected just upstream from Big Horn Lake did not exceed the criteria. Therefore, a segment of the Big Horn River, extending from the Greybull River downstream to an undetermined distance above Big Horn Lake (a continuation of the segment listed upstream in HUC 10080007), is listed on the 303(d) List. Further monitoring will be scheduled to better delineate the impaired reach as well as to identify other sources of fecal coliform bacteria.

Fecal coliform samples collected near the mouth of Shell Creek indicate that it does not meet its contact recreation use from its confluence with the Big Horn River upstream an undetermined distance. Granite Creek, a tributary to Shell Creek, was monitored for aquatic life use support and sampled for fecal coliform bacteria. The results of that monitoring indicate that it is not meeting its contact recreation uses from its confluence with Shell Creek upstream approximately 4 miles to the vicinity of Antelope Butte Ski Area. The data and field visits to the creek by DEQ suggest the leach field at the Antelope Ski Area may have been the significant contributing source for this impairment. The ski area was not active during the 2004-05 winter season and will not be active in the immediate future with the special use permit being relinquished in the fall of 2005. The DEQ conducted supplemental *E. coli* monitoring on Granite Creek in the fall of 2005. These provisional data do not show the dramatic increase in pathogen levels bracketing the ski area as were seen in 2001 and suggest the inactivity at the ski area may have eliminated the loading source. Additional monitoring on Granite Creek will confirm whether or not the impairment is still present. Both Shell and Granite Creeks are on Table A of the 303(d) List. Although Granite Creek is not meeting is contact recreation use, it does fully support its aquatic life uses. Granite Creek is a Class 2AB water and the impairment represents a human health risk. However, because there are preliminary indications that the loading source may no longer exist, Granite Creek has been given a “medium” priority for TMDL development. Shell Creek has been given a “low” priority for TMDL development because of SBHCD’s commitment to watershed planning on this creek. Mail Creek is a Class 1 tributary to Shell Creek, since it is in the Cloud Peak Wilderness Area. Assessment of Mail Creek indicate full support of it aquatic life uses. In

the lower reaches of Shell Creek, WGFD information suggests impacted riparian area and flow diversions may have degraded water quality from Shell Canyon to the Big Horn River.

Beaver Creek is listed on Table C (Threatened Waters) of the 303(d) List due to high fecal coliform counts recorded by USGS indicating it is threatened for its contact recreation use.

SBHCD has conducted monitoring on Shell Creek and Beaver Creek under a 319 grant (WACD, 2004). Results from that monitoring were not available for this report.

Crooked Creek (Class 2AB) flows into Wyoming from Montana and then flows into Bighorn Lake. Monitoring by DEQ shows that its aquatic life uses are fully supported from the irrigation diversion in SWNW Section 29, T58N, R95W upstream to the Montana state line. However, reductions of flow downstream from this diversion inhibit aquatic life to the extent that fisheries and aquatic life uses are affected accordingly, even in some sections below springs that appear to have perennial flows. This reach of Crooked Creek is impacted by pollution, rather than a pollutant which would require a TMDL.

Dry Creek Sub-basin (HUC 10080011)

Land uses in the Dry Creek Sub-basin are primarily livestock grazing, recreation, and oil and gas development. Much of this sub-basin has high erosion rates due to fragile soils and historic livestock use (RPO, 1979). In many areas of the Dry Creek Sub-basin, as well as other areas of the Big Horn Basin, the uplands are dominated by blue grama. Plant community modifications like this usually result in higher peak flows and reduced base flows, (i.e., more precipitation runs off and erosion is elevated on those areas that have been converted to blue grama dominance). Forage production is also reduced as a result of the change in plant species composition and reduced effective precipitation. Perennial native bunchgrasses have responded favorably to livestock grazing management changes that have been implemented in the area. The western half of the Dry Creek Sub-basin has been identified by the BLM as a high priority for watershed improvement.

Concerns have been expressed about precipitates in Oregon Coulee and Coalmine Gulch below the Oregon Basin Oil Field. According to the BLM, cattle and wild horses may avoid drinking the water in portions of Dry Creek below these areas.

BLM data indicate that livestock grazing practices may be preventing woody vegetation recruitment in the lower portion of the North Fork Dry Creek drainage, and this area is thought to be contributing excessive sediment to the Dry Creek system.

Lower Dry Creek is on Table C of the 303(d) List due to high fecal coliform counts recorded by USGS indicating it is threatened for its contact recreation use. SBHCD has conducted monitoring on Dry Creek under a 319 grant (WACD, 2004). Results from that monitoring were not available for this report. A watershed plan is expected to be completed in 2006 (WACD, 2005).

North Fork Shoshone River Sub-basin (HUC 10080012)

The headwaters of the North Fork Shoshone River Sub-basin are sited in the volcanic geologic materials of the northern Absaroka Range. Primary land uses are recreation, with livestock grazing and irrigated hayland in the lower watersheds. Soils are formed from Absaroka volcanic geologic materials, and are highly erodible. Mass wasting and landslides are common, and one landslide event in the spring of 1997 contributed hundreds of thousands of cubic yards of sediment to Middle Creek. Portions of this watershed burned in 1988, which is thought to have increased the sediment loading. This increased sediment loading has raised concerns about the amount of sediment being deposited in Buffalo Bill Reservoir. However, numerous watershed assessments indicate that despite these conditions, streams are meeting their aquatic life uses above the Shoshone National Forest boundary.

South Fork Shoshone River Sub-basin (HUC 10080013)

Most of the South Fork Shoshone River Sub-basin is within roadless or wilderness areas in the Shoshone National Forest, so human impact to water quality is minimal in much of the sub-basin. The dominant

geology within the higher elevations is of volcanic origin and very unstable, so natural sediment loading is very high.

Parts of the mainstem South Fork of the Shoshone River have experienced considerable bank erosion, due to attempts to control the river through bank modifications, which did not adequately consider natural hydrologic processes. As a result, when a "fix" was attempted in one stretch, it often caused the river to erode banks in adjoining stretches as the river adjusted. However, landowners have now implemented measures to allow flows to disperse energy on the floodplain and reduce erosion (WACD, 2004). BLM data show watershed degradation in the upper drainages of Timber and Deer Creeks, on the flank of Sheep Mountain. This is thought to be due to past livestock grazing practices, combined with atypical high flow events.

Shoshone River Sub-basin (HUC 10080014)
The Shoshone River receives water from Buffalo Bill Reservoir and flows into Big Horn Lake.
The settling pond effect of Buffalo Bill Reservoir removes sediment and many other potential water quality impairments. However, fine sediment deposited on the reservoir bottom becomes an air quality issue when the reservoir is low and the sediments are exposed to the high winds that frequent the area. The Bureau of Reclamation built dust abatement dikes to address this problem (WACD, 2004).

Irrigation development began in the early 1900's and included the first federal reclamation project. Buffalo Bill Dam and Reservoir (originally called Shoshone Dam), was built to contain runoff from the North and South Forks of the Shoshone River, and store water, primarily for irrigation. The reservoir is also used for recreation, as well as generating electricity.

Bottomlands and flat benches along the Shoshone River are extensively irrigated and farmed. Most of the other uplands are BLM land and are primarily grazed by livestock. Portions of the sub-basin have extensive oil and gas development, and bentonite and gypsum are presently being mined.

Most of the BLM land lying south of the river and north and east of Corbett Dam has been identified by the BLM as a high priority for watershed improvement. Much of this area has elevated erosion rates due to historic livestock impacts and subsequent conversion of native bunchgrasses to blue grama. A higher proportion of the precipitation runs off, which reduces effective soil moisture and further reduces forage production. The area contains significant amounts of badlands geology, which naturally produce high runoff and erosion rates. BLM data also indicates roads and grazing may be causing excessive erosion in parts of the Deer, Coon, and Whistle Creek watersheds.

The Cody Conservation District (Cody CD) completed an *E. coli* assessment 319 project in the upper Shoshone River watershed in late 2005. The draft report for that study has been submitted to DEQ, but not finalized. Provisional data at this time suggest *E. coli* concentrations are minimal immediately below Buffalo Bill Reservoir and increase gradually downstream to a point downstream of Corbett Dam. Those provisional data do not suggest a threatened or impaired condition on the Shoshone River within the reach assessed.

Sage Creek, which flows into the Shoshone River, a little east of Cody, may be a possible contributor of excessive sediment and nutrients to the Shoshone River due primarily to irrigation return flows into Sage Creek, and areas of poor riparian condition along portions of Sage Creek and upper Hoodoo Creek (SCS, 1994). The Cody CD assessment included some synoptic *E. coli* sampling on Sage Creek. Provisional data from that assessment suggest there may be pathogen concerns in this water.

Dry Gulch is a small watershed that empties into the Shoshone River north of Cody and immediately upstream of Corbett Dam. This small watershed carries irrigation wastewater to the river. The Cody CD assessment included some synoptic *E. coli* sampling on Dry Gulch. Provisional data from that assessment

suggest there may be pathogen concerns in this water.

The BLM portion of Sulphur Creek (about 1.25 miles) is very wide and shallow and BLM data indicates riparian vegetation in poor condition. This part of the stream has been grazed historically by cattle season-long. A deferred rotation livestock grazing strategy will be implemented on the majority of the BLM portion of this stream in 2004, which should improve the condition of the riparian vegetation. Produced water discharges from oil and/or gas development in the upper watershed have been permitted for the discharge of TDS and other pollutants at concentrations protective of existing designated uses.

BLM data indicate portions of Cottonwood Creek, north of Cody, are incised and actively eroding, probably in response to historic land uses such as mining, livestock grazing, and development of several springs for a fish hatchery and livestock waters. There is also a failed and abandoned irrigation structure that has possibly initiated headcutting of the drainage just north of agricultural land on the outskirts of Cody. Current BLM management is addressing water quality concerns associated with livestock grazing on the BLM sections. The former Yellowstone Refinery property is located immediately adjacent to Cottonwood Creek. The Solid and Hazardous Waste Division of DEQ is currently working with the responsible party to clean up the refinery property including groundwater contamination and its potential impacts to Cottonwood Creek.

Excessive sediment has been identified as a possible water quality problem in Alkali Creek, which heads on Heart Mountain and drains Ralston Flats (SCS, 1994).

Samples which exceed the fecal coliform criteria for primary contact recreation have been collected by DEQ from Bitter Creek near Garland, and this stream is on Table A of the 303(d) List. The Powell Clarks Fork Conservation District (PCFCD) has monitored water quality at five sites in the drainage and has completed a watershed plan Data from that monitoring effort were not complete due to a theft of PCFCD computer hardware (including records and QA/QC information). The evaluation data from this assessment substantiate the impairment and suggest the extent of impairment may extend upstream as far as the Lane 8 bridge (approximately 2.5 miles upstream of the City of Powell Wastewater Treatment Plant). A more definitive location for this impairment can not be given until credible data are collected.

Discharge from the Garland Oil Field is a concern of the BLM, due to reported precipitates and impacts to vegetation below a discharge point. There are only two active WYPDES permits in the Garland Field. WY-0001759 is the discharge from the Garland Tank Battery (OT) and WY-0036421 is the discharge from the Garland Gas Plant. There is no indication in either file of concerns with vegetation. Information from BLM also indicates bentonite and gypsum mining and roads may be creating some water quality problems around Little Sheep Mountain in the eastern part of the Shoshone River Sub-basin. Excessive alkalinity in soils in the Lovell Lakes area south of Lovell may be due to flood irrigation and poor drainage of these naturally alkaline soils.

Salinity, excessive sediment, nutrients, and pathogens have been identified by BLM, DEQ, WGFD, and the SCS (now the NRCS) as possibly impacting water quality in the Shoshone River. Extensive pesticide sampling by the USGS indicates pesticides are rarely measured above detection levels in the river. Shoshone Conservation District has monitored the Shoshone River for two years under a 319 assessment project (WACD, 2004). That project ended in March 2005, but those data have not been submitted and are not available for this report.

In 2000 and 2001, DEQ conducted fecal coliform bacteria monitoring in several of the lower drainages in the lower Shoshone River watershed to better delineate the extent of impairment. This was done in response to concerns by an area physician who treated several cases of severe gastro-intestinal illness in patients who had been swimming in area waters. Results of the monitoring indicate several of the waters had exceedences

of the fecal coliform criteria and are impaired for contact recreation use. The following waters in the Lower Shoshone River watershed are on the 303(d) List:

The Shoshone River, from its confluence with Big Horn Lake upstream an undetermined distance.

Bitter Creek, from its confluence with the Shoshone River upstream an undetermined distance above Powell.

Sage Creek, from its confluence with the Shoshone River upstream an undetermined distance above Big Wash.

Polecat Creek, from its confluence with Sage Creek upstream an undetermined distance.

Big Wash, from its confluence with Sage Creek upstream to Sidon Canal.

Whistle Creek, from its confluence with the Shoshone River upstream an undetermined distance.

Additionally, the lower reach of Foster Gulch, is on Table C of the 303(d) List due to high fecal coliform counts recorded by USGS indicating it is threatened for its contact recreation use.

The sources of fecal coliform contamination in the streams listed above have not been determined, although a 1978 Section 208 study identified many cases of poorly operating septic systems in the watershed. County commissioners and conservation districts are investigating establishment of a Clean Water Act - State Revolving Loan funding program to provide low interest loans for septic system rehabilitation. The Shoshone Conservation District (SCD) has also initiated monitoring at 16 sites and has received 319 funding to conduct additional watershed assessment. The SCD will pursue watershed plan development by 2006 (WACD, 2002). Data from that monitoring were not available for this report.

Information from SCD, WGFD, and a Cooperative River Basin Study (SCS, 1994) suggest that salinity, oil, nutrients, and streambank degradation may be problems in Sage Creek in northwest Big Horn County. The BLM also identified these concerns in one of its tributaries, Polecat Creek. Possible sources may be bentonite mining, roads, farming, or oil production. SCD has conducted monitoring on these streams, but the data were not available for this report (WACD, 2004).

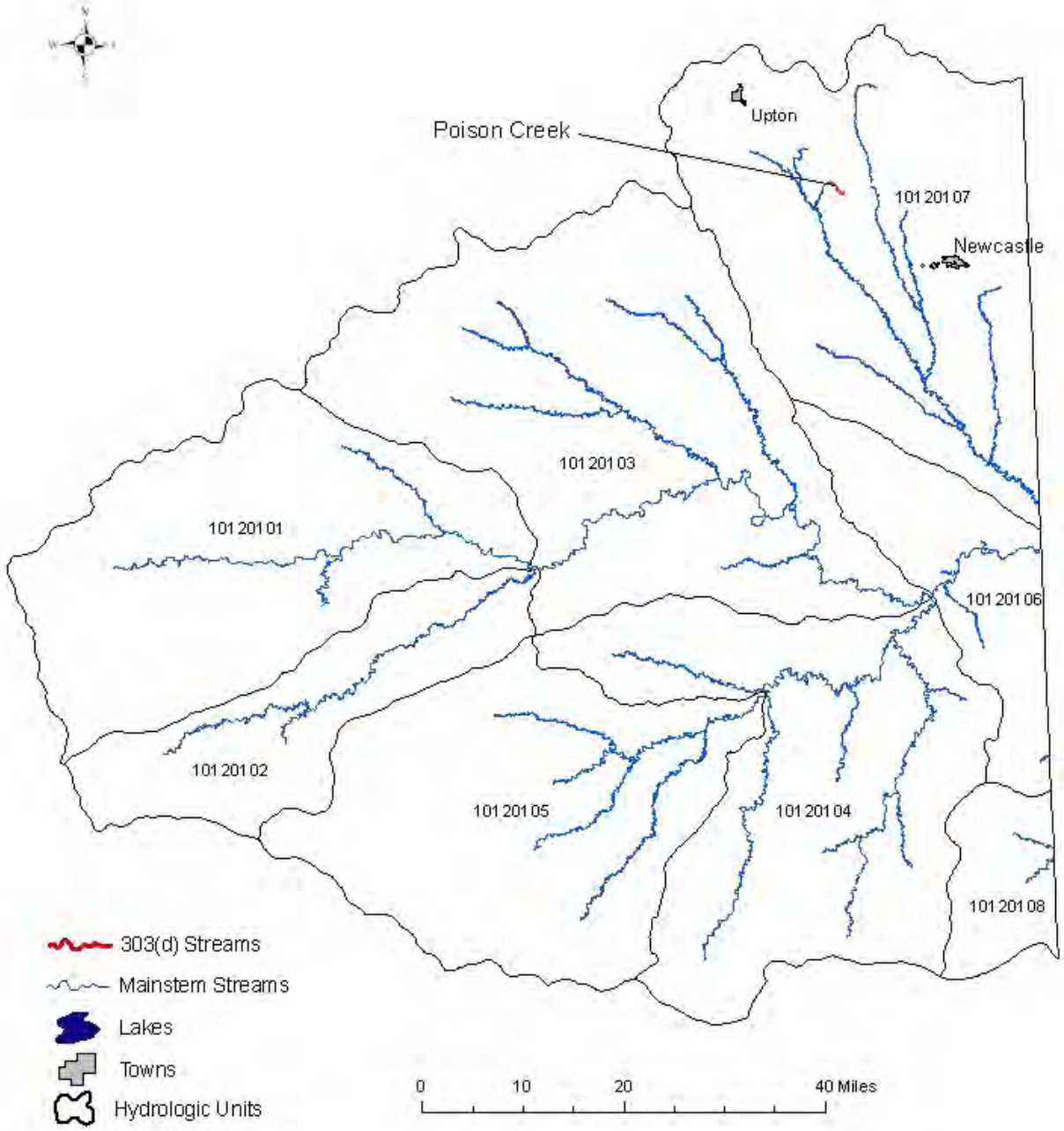
Monitoring was conducted by DEQ on Sage, Alkali, Polecat, and Whistle Creeks, as well as the Shoshone River, in 2001. Preliminary data evaluation is inconclusive on aquatic life use support, therefore the streams are being considered for additional monitoring.

Little Big Horn River Sub-basin (HUC 10080016)

The upper portion of the Little Big Horn River Sub-basin headwaters is in Wyoming before draining into Montana. Except for a few main stem miles near the border, most reaches in this sub-basin are within the Big Horn National Forest. Grazing, recreation, logging, and some recreational gold mining are the primary land uses. Stream habitat inventories were collected by the Big Horn National Forest. Fish habitat enhancement and changes in grazing management practices have addressed some past concerns about the effects of increasing sedimentation on water quality.

DEQ conducted monitoring on the Little Big Horn River and West Pass Creek in 2000. The data indicates full support aquatic life uses in both these waters.

Cheyenne River Basin



Cheyenne River Basin

The Cheyenne River Basin lies in eastern Wyoming and drains areas of the Powder River geologic basin as well as the southern portion of the Black Hills uplift. Other than the southern Black Hills and some breaks and escarpments, most of the basin consists of rolling plains. The Thunder Basin National Grasslands occupies a large portion of the central part of this basin. Streams originating in lowland areas are usually intermittent or ephemeral, and most perennial streams originate in the Black Hills or Pine Ridge escarpment. Because the sedimentary rocks in the Powder River geologic basin contribute significant levels of iron, manganese, and sulfate to surface waters, several streams in that portion of the basin are not protected by aesthetic criteria for iron and manganese. Primary land uses are grazing, with areas of hay production, coal mining, and oil and gas production.

Antelope Creek Sub-basin (HUC 10120101)
The headwaters of the Antelope Creek Sub-basin are east of Edgerton. Land uses are primarily grazing and oil production, with coal mining in the northeastern third of the sub-basin. A reach of Antelope Creek has been nominated as a possible plains reference stream.

Dry Fork Cheyenne Sub-basin (HUC 10120102)
Land uses in the Dry Fork Cheyenne Sub-basin are primarily grazing and oil and gas development. Uranium exploration and mining occurred from the 1950s through the 1980s in the southern portion of this sub-basin, an area where all reaches are non-perennial.

Upper Cheyenne Sub-basin (HUC 10120103)
Coal mining occurs in the Upper Cheyenne Sub-basin east of Wright. Other land uses include grazing and oil and gas development.

Niobrara County Conservation District (Niobrara CCD) has conducted monitoring on both the Cheyenne River and Snyder Creek. Their data show that Snyder Creek does not flow during periods of drought.

Lance Creek Sub-basin (HUC 10120104)
Land uses in the Lance Creek Sub-basin include grazing, and oil and gas development. Niobrara CCD has conducted monitoring on Lance Creek.

Lightning Creek Sub-basin (HUC 10120105)
Land uses in the Lightning Creek Sub-basin are chiefly grazing, with some oil and gas development. Monitoring by DEQ identified a reach of Lighting Creek that is being considered as a reference for a least impacted plains stream.

Angostura Reservoir Sub-basin (HUC 10120106)
Land uses in the Angostura Reservoir Sub-basin are primarily grazing, with some oil and gas development. The Cheyenne River in South Dakota is listed as impaired on their 303(d) list due to sediment and high total dissolved solids, and TMDLs are being developed. Existing data and information do not suggest water quality problems currently exist in Wyoming. However, Niobrara CCD has raised concerns about coal bed methane produced water discharges into the Cheyenne River basin. Niobrara CCD has conducted monitoring on the Cheyenne River since 1999.

Beaver Creek Sub-basin (HUC 10120107)
Land uses in the Beaver Creek Sub-basin include grazing, hay production, and oil and gas development. Many of the streams in this sub-basin originate in the Black Hills and are perennial.

Poison Creek flows through the Osage Oil Field into Beaver Creek near Osage. Numerous small oil seeps, some of which reach Poison Creek, have been identified in Sections 16 &17, T 46 N, R 63 W. Because of the considerable exploration and production of both oil and bentonite, it is difficult to determine whether the seeps are natural, human induced, or a combination of the two. The Wyoming Oil and Gas Conservation

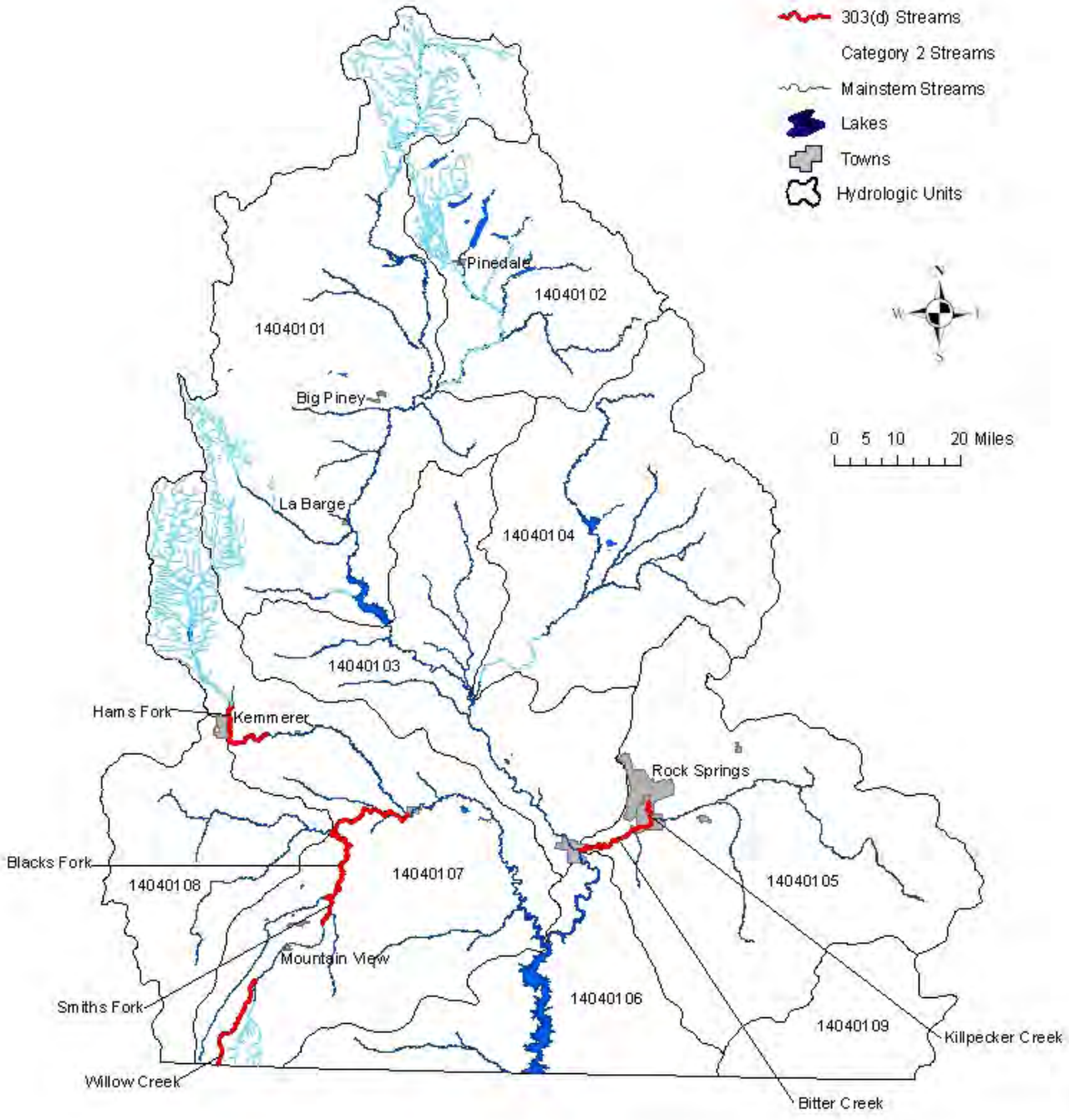
Commission determined it would be more efficient to mitigate the problems than to attempt to identify all causes, and conducted a cleanup effort to prevent the contamination of Poison Creek and to protect aquatic life and wildlife. Those portions of Poison Creek in Sections 16 and 17 are on Table C of the 303(d) List, and have been monitored, but an assessment report has not been completed.

Salt Creek, a tributary to Stockade Beaver Creek, was named for the natural brine springs which contribute a large salt load to Stockade Beaver Creek and the Cheyenne River basin. DEQ conducted monitoring on Beaver Creek and Stockade Beaver Creek, and is considering additional monitoring.

Hat Creek Sub-basin (HUC 10120108)

Primary land use in the Hat Creek Sub-basin is grazing. DEQ conducted a bioassessment of the Sage Creek watershed which indicates full aquatic life use support. Existing data and information also suggest that no significant water quality problems exist on Sage Creek.

Green River Basin



Green River Basin

The Green River Basin is in the southern part of Wyoming. Snow melt runoff from higher elevations is the major water sources for the Green River and most of its tributary systems. Almost all of these headwaters are in granitic or metamorphic rock and have some of the best quality water in the basin. Lower elevations have the least precipitation, and most streams originating there are intermittent or ephemeral. As streams flow through more arid lower elevations and the easily eroded sedimentary geologic materials found there, TDS values and sediment loads generally increase. Peak flows usually occur in May and June as snowmelt water moves through the basin, and sudden severe summer thunderstorms occasionally add to July and August flows. There are spring fed perennial reaches throughout the river basin.

Because the Green River is part of the Colorado River Compact of 1922, its waters are apportioned among the participating states. The Green River has the largest amount of unappropriated water in the state. It is the largest tributary of the Colorado River, and its waters are subject to salinity control through the Colorado River Basin Salinity Control Program. Although there are few salinity problems in Wyoming compared with the lower Colorado River Basin, it is often more economically feasible to reduce salinity in upper parts of the Colorado Basin. Because irrigated agriculture can contribute to salinity by percolation, evaporation, and return flows through shallow soils developed on saline geologic materials, major salinity control measures to reduce irrigation related salinity input to the Green River have been implemented in the Big Sandy and Flaming Gorge Sub-basins.

Extensive natural salt deposits of trona (a sodium carbonate) were inferred from late 1890's well water quality. Trona deposits were investigated in the late 1930s. Mining began in the late 1940s and mining and prospecting continue today. Trona typically occurs with halite and gypsum. These Wyoming deposits are the world's largest natural source of trona. Coal deposits have also been mined in parts of the basin. Oil development began around 1920, and both oil and natural gas are produced throughout much of the basin. The primary agricultural land uses are grazing and irrigated hay production.

Upper Green Sub-basin (HUC 14040101)
The Upper Green Sub-basin includes all tributaries into the Green River above Fontenelle Dam, except the New Fork Sub-basin. Fontenelle Reservoir is in the southern part of this sub-basin below LaBarge, Wyoming. It was constructed from 1961-64 and modified in 1984-86. Headwaters are in the Bridger-Teton National Forest, primarily in well indurated igneous and metamorphic geology. Lower elevation areas of the sub-basin lie in primarily fine grained sedimentary rocks which are a natural source of fine sediment and TDS in surface waters. Primary land uses are grazing, recreation, irrigated hay production, and oil and gas development.

Kendall Warm Spring is the only known habitat of the Kendall Warm Springs dace, a unique fish subspecies which is the only Wyoming fish currently listed (in 1980) under the Endangered Species Act. Its listing is not due to any water quality problems, but due to the naturally limited area it is found.

Dry Piney Creek is perennial in its headwaters and part of the main stem, but becomes non-perennial before its confluence with the Green River (WGFD, 2002). Results from DEQ monitoring conducted on Dry Piney Creek were inconclusive, so further monitoring will be conducted to determine use support. A gas processing facility, and oil and gas wells are located in the upper portions of the LaBarge Creek-Dry Piney Creek-South Piney Creek drainages. Concerns with oil seeps and ponds associated with oil wells, and physical degradation of the stream have been identified by DEQ. Seasonal dewatering of North Piney, Middle, and South Piney Creeks may limit potential aquatic life (WGFD, 2002; WGFD, 2004). Extensive monitoring by DEQ in the watershed between Highway 191 and the Green River Lakes indicate that streams in this portion of the watershed are supporting their aquatic life uses.

Bioassessments conducted by DEQ on LaBarge and Fontenelle Creeks indicate that aquatic life uses are supported in the upper drainages within the Bridger-Teton National Forest, and in the lower mainstem of Fontenelle Creek, just above Fontenelle Reservoir. However, concerns have been identified by DEQ with

physical degradation in parts of the lower La Barge Creek drainage, as well as seasonal dewatering due to irrigation withdrawal (WGFD, 2002). DEQ data collected on Rock Creek, a tributary to LaBarge Creek, indicate it is fully supporting its aquatic life uses.

Sublette County CD sponsored a watershed improvement project to correct physical degradation of some ephemeral stream channels, which drain through Reardon Draw and reportedly impair aquatic life uses on the Green River. Implementation measures included development of a stock water system and livestock herding for grazing management. At this time it is undetermined if there have been water quality improvements. The lower three miles of Reardon Draw was listed on Table C of the 303(d) List, however the project took place in the Milleson Draw watershed, and Sublette County CD claims the Green River below Reardon Draw was the water affected by excessive sediment (Sublette CCD, 1993). Under an agreement with Sublette County CD, Reardon Draw has been removed from Table C of the 303(d) List due to this erroneous listing. Sublette County CD has conducted monitoring on the Green River, but the data submitted to DEQ was not in a format that would allow analysis in time for this report.

New Fork Sub-basin (HUC 14040102)
Headwaters of the New Fork Sub-basin are in granitic and metamorphic geologic materials in the Wind River Mountains. The headwaters area contains hundreds of lakes, a remnant of past glaciation. Water quality is reported as good in most of the upper watersheds, however full use attainment monitoring has not been conducted. Geologic materials in the lower sub-basin include fine to coarse grained sedimentary rocks and are a natural source of fine sediment and TDS. Land uses in the sub-basin include recreation, forestry, grazing, irrigated hay production, and oil and gas development. Limited uranium exploration was carried out in the Pinedale area.

Bioassessments conducted by DEQ in the watershed between Highway 191 and the New Fork Lakes indicate that this portion of the watershed is supporting its aquatic life uses.

Pine Creek below the Pinedale WWTP has been removed from the 303(d) List, due to approval of the TMDLs for ammonia, fecal coliform, and TRC associated with routine renewal of the discharge permit, and recalculation/verification of the TMDL.

Slate Creek Sub-basin (HUC 14040103)
Slate Creek Sub-basin includes the Green River and its tributaries, other than the Big Sandy River, below Fontenelle Reservoir and above Bitter Creek, near Rock Springs. Geologic materials include sandstone, mudstone, limestone, oil shale, and conglomerate. Soils developed in these materials tend to be saline and alkaline, erode easily, and can be very difficult to stabilize after being disturbed. Many streams are intermittent or ephemeral and water quality is usually similar to basin streams derived in this type of geology. The Seedskadee National Wildlife Refuge lies along the Green River below Fontenelle Reservoir. This refuge supports a unique population of waterfowl and is an important recreational fishery. Land uses include grazing, oil and gas development, and trona mining and processing. Oil and gas production began in the early 1900s and continues today.

Big Sandy Sub-basin (HUC 14040104)
Headwaters of the Big Sandy Sub-basin are in the granitic rocks of the southern Wind River Range. Because of this geology, much of the substrate in the streams is coarse sand derived from decomposed granite. Land uses in the Big Sandy Sub-basin are primarily grazing, irrigated hay production, recreation, oil and gas development.

Water is diverted from the Big Sandy River, below Big Sandy Reservoir, to irrigate lands in the Eden Project. Irrigation seepage into shallow aquifers has created saline seeps and springs below the Eden Project, which contributed about 149,180 tons of salt annually into the Green River (SCS, 1987). The USDA Big Sandy River Unit Plan, published in1988, consists of converting 15,700 acres of surface irrigation to low-pressure sprinkler irrigation to reduce salt loading by approximately 52,900 tons per year (CRBSCF, 2002). This program is being managed through the NRCS, and has converted 10,790 acres of irrigated lands to date, which has resulted in a salt load reduction of 42,319 tons per year. Effects of the

salinity reduction on streams in the Big Sandy and Green River drainages have not been determined, however crop production and water savings have reportedly increased where irrigation conversion has occurred (SWCCD, 2004).

Several riparian exclosures were created in the 1980s to protect parts of the riparian area along the Big Sandy River, between Little Sandy Creek and the Green River, and to enhance fish habitat. Rock sill structures have been built in Big Sandy River and in Bone Draw with the goals of raising the water table, increasing riparian vegetation, providing habitat for juvenile fish, and improving channel conditions. Erosion, unstable banks, and lack of woody riparian vegetation have been identified as problems in this reach of the Big Sandy River. The primary sources of these problems are thought to be due to changes in flow regime since the construction of Big Sandy Reservoir, and to the partial conversion from sheep grazing to cattle grazing, which changes the utilization of vegetation. The Big Sandy Working Group (BSWG), comprised of the BLM, grazing permittees, WGFD, Trout Unlimited, Sweetwater County Conservation District (then Big Sandy CD), other stakeholders, and a facilitator, was formed in 1996 to address these problems. BSWG developed a 10 year goal and a 50 year vision statement that identified some of the trends the river corridor should follow. In order to meet these goals, the allotment management plans for the four allotments that use this reach of the Big Sandy River have been changed. Some of these changes include: modification of grazing rotation, allotment boundaries and season of use; installation of electric fencing; development of upland water sources, and; implementing the monitoring plan developed by BSWG (BLM-GR, 2003).

Despite the riparian and bank stability problems, assessments conducted by DEQ in 1998 indicate that aquatic life uses are supported on the Big Sandy River, between the Green River and the confluence with Little Sandy Creek.

Monitoring conducted by DEQ on Little Sandy Creek has identified areas of habitat degradation and streambank instability, as has BLM data. The BLM and grazing permittees are cooperatively working to modify grazing practices along portions of Little Sandy Creek to improve the riparian and stream habitat. These modifications include installation of electric fencing and rotation of stock through the allotment so riparian areas are only grazed once per season (BLM-GR, 2002). DEQ has been monitoring annually to quantitatively track improvements in habitat quality and bank stability.

Bitter Creek Sub-basin (HUC 14040105)

The Bitter Creek Sub-basin lies entirely within sedimentary basin geology, composed of mostly fine grained sedimentary rocks containing salts and other evaporite minerals. Because of the arid climate and relatively low elevation and basin terrain, most reaches in this drainage are non-perennial. Snowmelt and occasional rainstorm events often transport high loads of sediment and dissolved salts. Land uses include grazing, coal mining, phosphate mining, uranium exploration, and oil and gas development.

Bitter Creek, a tributary to the Green River, drains a large arid area (an outlying part of the Red Desert) in the eastern portion of the sub-basin, including a western fringe area of the Red Desert basin. Monitoring conducted by DEQ in 1998 on Bitter Creek near Rock Springs and a tributary, Killpecker Creek, indicates that both these streams are impaired for recreational use due to elevated fecal coliform bacteria counts. Bitter Creek is classified as a non-game fishery (Class 2C). A fish kill was noted on Bitter Creek during sampling in 1998. Chloride samples collected by DEQ indicate that Bitter Creek below Killpecker Creek is partially impaired for its non-game fishery use due to chloride concentrations above the criteria of 230 mg/L. Chloride has been added as a cause of impairment on the 303(d) List. Diurnal oxygen fluctuations and habitat degradation are also concerns on these streams. A current 319 watershed improvement project, administered by the Sweetwater County Conservation District (SWCCD) is investigating the problems and concerns on these waters. That project is slated to end in April 2006 and data will be submitted to DEQ. The Bitter/Killpecker Creek Watershed Advisory Group is developing a watershed plan for these waters. (SWCCD, 2004; WACD, 2005).

Flaming Gorge Sub-basin (HUC 14040106)
The Flaming Gorge Sub-basin includes all the tributaries to the Green River and Flaming Gorge Reservoir below Bitter Creek and above the confluence with Vermillion Creek (in Colorado), except the Blacks Fork. Flaming Gorge Reservoir, built in 1958-64 and modified in 1978 and 1984, and the Flaming Gorge National Recreation Area are within this sub-basin although the dam itself is in Utah. Green River and the Black's Fork flow directly into the upper part of the reservoir; the Henry's Fork flows into the lower part of the reservoir in Utah. Most of the sub-basin consists of fine grained sedimentary rocks, many of which are easily eroded and contain large amounts of evaporite minerals. Land uses include grazing, irrigated agriculture (mostly in the Henry's Fork drainage), recreation, and oil and gas production.

The Little Mountain Watershed Enhancement project was initiated in 1990 because of concerns with declining Colorado River Cutthroat trout populations due to deteriorated stream habitat conditions, and concerns with the mule deer population. This project is sponsored by WGFD, BLM, landowners, and a number of organizations, and is designed to restore watershed function and decrease eutrophication of Flaming Gorge Reservoir via modification of grazing management, prescribed burns, re-introduction of beaver, and other measures. The project currently includes Currant Creek and parts of the Trout, Sage, and Red Creek watersheds, and has shown marked improvement of both riparian and upland areas, and increases in perennial flows.

Blacks Fork Sub-basin (HUC 14040107)
Headwaters of the Blacks Fork Sub-basin are in the Uinta Mountains in northeastern Utah, and the Tunp and Wyoming Ranges in Wyoming. The Black's Fork flows in a loop through the Bridger Basin before flowing into the upper part of Flaming Gorge Reservoir. Major tributaries include the Smiths Fork which also headwaters in Utah, and the Hams Fork, which drains from the north. Muddy Creek is another tributary, but its sub-basin (HUC 14040108, discussed below) is not included in the Black's Fork Sub-basin. Land uses in this sub-basin include grazing, irrigated hay production, trona and coal mining, and oil and gas production.

The Hams Fork near Diamondville was listed on Table A of the 1998 303(d) list due to high pH (above the criteria of 9.0 standard units) measurements indicating it is partially impaired for its aquatic life uses below the Town of Kemmerer. The elevated pH is thought to be due primarily to excessive photosynthetic activity, in naturally high pH waters, from nutrient enrichment below the Kemmerer-Diamondville WWTF. Nutrient enrichment can also result in very low dissolved oxygen concentrations when photosynthesis is not occurring. The Kemmerer-Diamondville Joint Powers Board has committed to monitoring the river above and below their discharge location, and will be cooperatively monitoring with Lincoln Conservation District. WYPDES permit modifications are likely when the permit comes up for renewal in 2008. The Hams Fork is a Class 2AB water, however, the impairment does not represent a risk to human health. Because of these items and the permit renewal scheduled for 2008, this water is given a "medium" priority for TMDL (discharge permit waste load allocation) development.

The Blacks Fork, from its confluence with the Hams Fork upstream to an undetermined point above the Smiths Fork, is on Table A of the 303(d) List for impairment of contact recreation uses due to exceedences of the criteria for fecal coliform bacteria. The source of fecal contamination and the extent of contamination above and below the sample point is unknown at this time. The Black's Fork below the Hams Fork has been monitored, but the results are inconclusive regarding aquatic life use support. Uinta County Conservation District (UCCD) has monitored water quality at 12 sites on the Blacks Fork as part of a Section 319 assessment grant. That project is slated to expire in August 2006 and those data will be submitted to DEQ. The Blacks Fork is currently contained within the approved Blacks Fork & Smiths Fork Rivers Watershed Management Plan sponsored by UCCD.

The Smiths Fork of the Green River is on Table A of the 303(d) List after DEQ monitoring determined the stream was only partially supporting its aquatic life uses as a Class 2AB water due to loss of biological integrity and physical degradation of the stream. Smiths Fork from the confluence with the Black's Fork

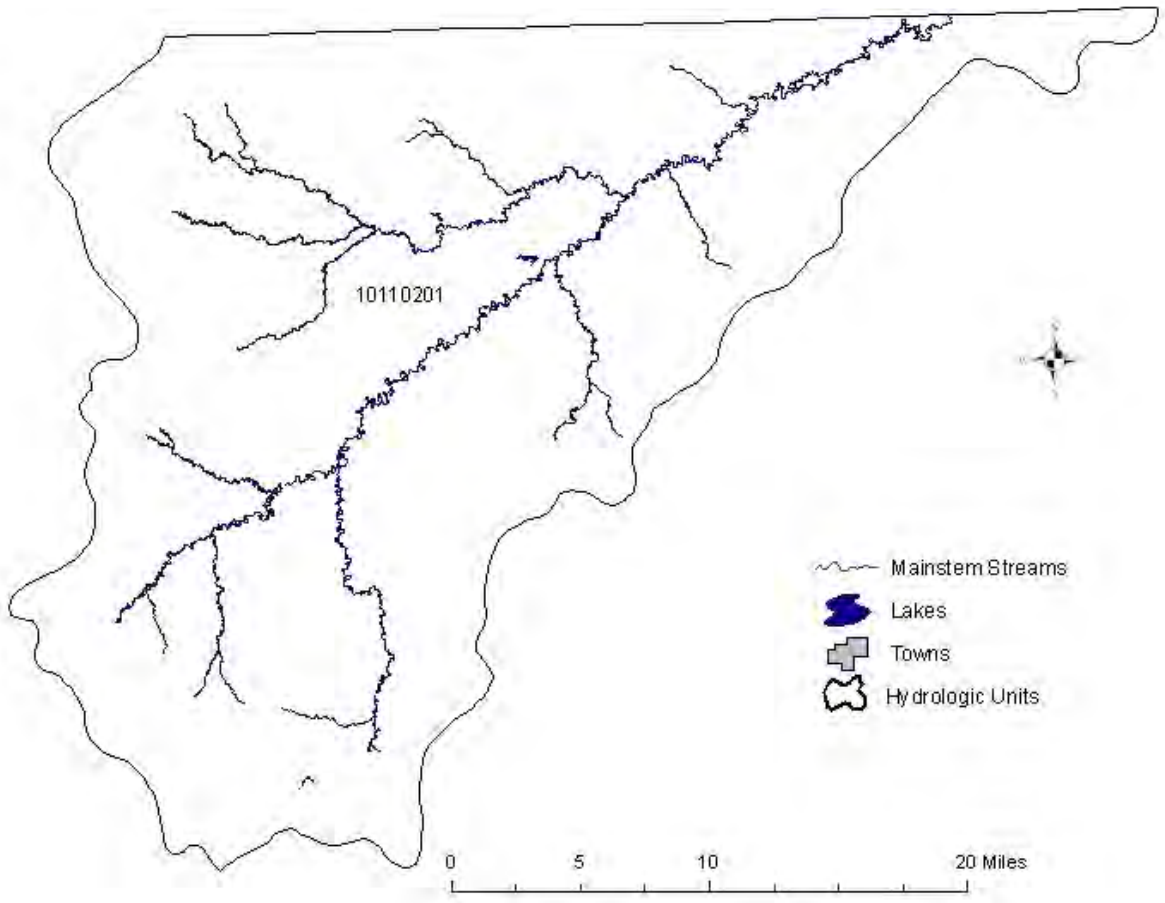
upstream an undetermined distance was added to Table A of the 303(d) List after fecal coliform monitoring, conducted by DEQ, showed the stream was not meeting its use for contact recreation. UCCD has monitored water quality at 5 locations on the main stem of the Smiths Fork as part of their 319 project. Those data are not available for this report but will be submitted to DEQ upon completion of the project. The Smiths Fork is also covered under the watershed management plan sponsored by UCCD.

The East and West Fork of Smiths Fork, and Willow Creek above the Black's Fork, were placed on Table C of the 1998 303(d) List due to threats of aquatic life use support due to physical degradation of the stream channels. UCCD completed a 319 watershed improvement project in 1999 to improve the physical condition of the stream channels and riparian areas. Data submitted by UCCD were not sufficient to determine use support, but indicate improvement of the habitat in these streams (UCCD, 2001). DEQ monitored these streams in 2003, and that monitoring also showed habitat improvement. Data indicate both East and West Forks of Smiths Fork fully support their aquatic life uses, and have been removed from the 303(d) List. However, data collected on Willow Creek in 2003 show exceedences of temperature and pH criteria, and a degraded biological community in the lower reach, which contrasts with the noted improvements in riparian habitat and management. The lower scoring data are possibly related to the drought, but definitive use support at this time is unclear. DEQ plans to allow several years for stream health to recover before conducting further monitoring. Willow Creek remains on Table C of the 303(d) List, with a "low" priority for TMDL development because of improved management in the watershed and its inclusion in the approved Blacks Fork and Smiths Fork Rivers Watershed Management Plan.

Muddy Creek Sub-basin (HUC 14040108)
Muddy Creek Sub-basin drains the east slope of the Bear River Divide, north of Evanston, and Oyster Ridge, south of Kemmerer, and then flows into the Black's Fork of the Green River. Soils in this sub-basin were developed from shale and sandstone geologic materials, with added windblown sand. These arid soils tend to have high carbonate content and are usually easily eroded by wind or water. The Oyster Ridge area has been mined for coal at least since the early 1900's and is the site of the historic Cumberland Mining District. Land uses include grazing, some irrigated hay production, oil and gas development and production, and historic coal mining.

Vermillion Sub-basin (HUC 14040109)
The Vermillion Sub-basin drains a portion of the southern Red Desert before flowing into Colorado and the Green River. The primary land uses are grazing, and oil and gas development. Perennial reaches in this sub-basin include portions of the main stem of Vermillion Creek, the main stems of Coyote Creek and Canyon Creek. Vermillion Creek drains into the Green River in Colorado and contributes a TDS load of mostly sulfate and sodium from the area's geologic materials. In the Vermillion Creek and Coyote Creek watershed, BLM, WGFD, landowners, permittees, and the National and Wyoming Wildlife Federation are cooperating in an allotment management plan, which is reducing sediment loads and improving riparian areas. DEQ conducted assessment work in the Vermillion Sub-basin in 1998. Those data were inconclusive and the watershed was revisited in 2003. The results of the most recent assessment are not finalized at this time.

Little Missouri River Basin



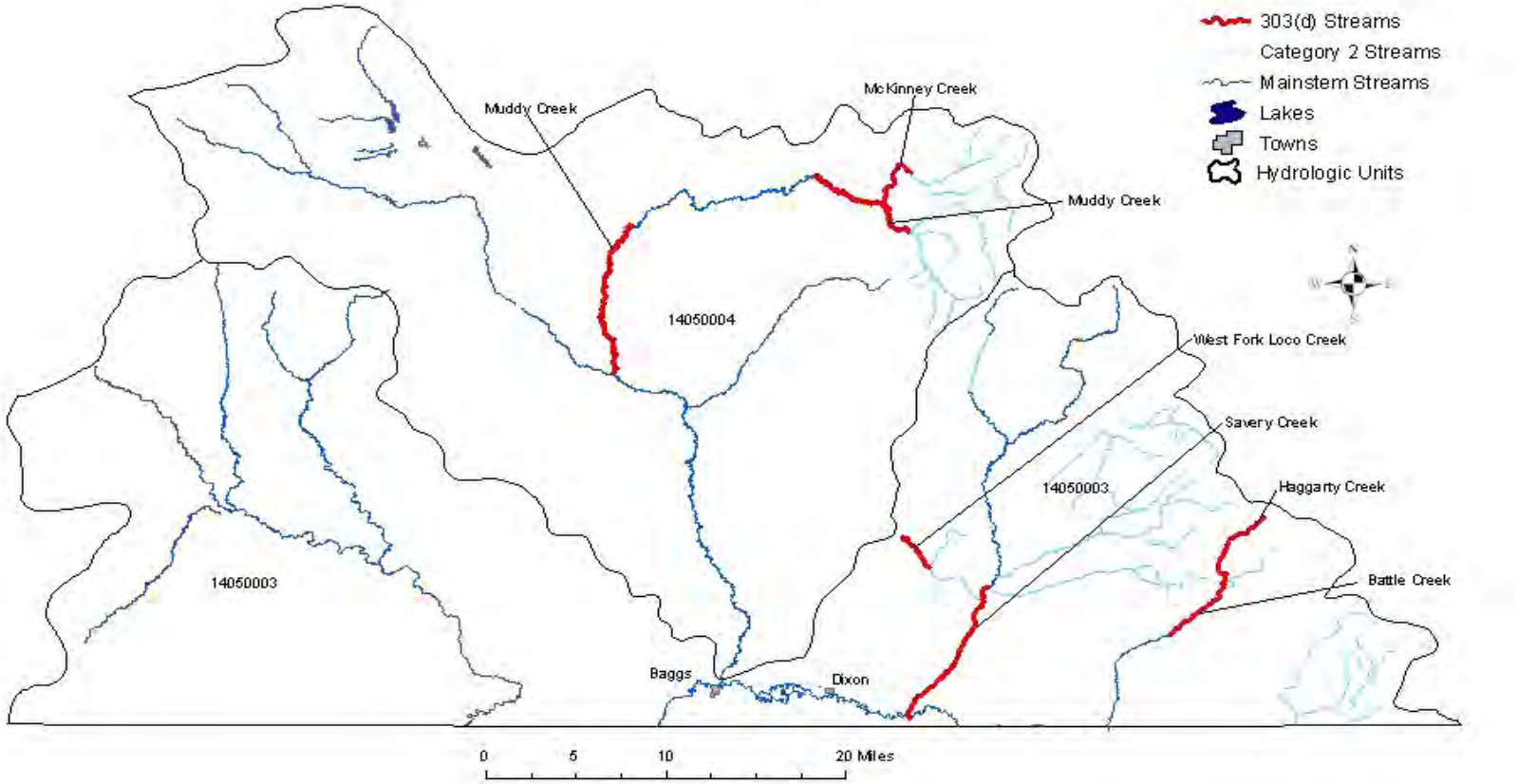
Little Missouri River Basin

The Little Missouri Basin in Wyoming includes only one defined sub-basin (HUC 10110201). Land uses include grazing, farming (both dryland and irrigated), bentonite mining in the lower drainages, and oil production in the upper drainages. Concerns with siltation and flow alteration in the Little Missouri and the North Fork of the Little Missouri were identified by Devils Tower Conservation District (now Crook County Resource District). However, bentonitic clays often remain suspended in water, and a certain degree of turbidity is natural. Stream flow is often intermittent, however, water generally remains in pools, even during dry periods. Many of the ephemeral tributaries in this sub-basin have been dammed by earth berm dams. Approximately 500 acres of abandoned bentonite mine lands have been reclaimed by AML in the sub-basin. Bentonite companies continue to mine and reclaim land in this area.

A large wetland complex is being developed on the North Fork of the Little Missouri River, at the site of a large breached earthen dam. This project is expected to improve both wildlife and aquatic habitat.

DEQ collected monitoring data in the basin in 2002, with complete results not yet available.

Little Snake River Basin



Little Snake River Basin

The Little Snake River Basin is bordered on the east by the Continental Divide along the Sierra Madre Mountains, the north by the Great Divide Basin, and to the west by the Green River Basin. The Little Snake River is a tributary to the Yampa River, in the Green and Colorado River System. The Sierra Madre mountains are primarily composed of Precambrian igneous and metamorphic rocks which are relatively resistant to erosion. However, in the lower elevations the geology consists of mostly fine grained sedimentary rocks, most of which are easily eroded and often contain high levels of various salts.

Little Snake Sub-basin (HUC 14050003)
Haggarty Creek is the site of an inactive copper mine, the Ferris-Haggarty/Osceola Tunnel, which dates from 1898. Haggarty Creek originates near the Continental Divide and confluences with Lost Creek to form West Fork Battle Creek. Monitoring on Lost Creek by DEQ indicates it fully supports its aquatic life uses. Haggarty Creek has been on past 303(d) lists due to metal exceedences (primarily copper with less toxic amounts of silver and cadmium) discharging from the Ferris-Haggarty Mine. The Department of Environmental Quality - Abandoned Mine Lands Program has funded a remediation project to treat the effluent and a proposed TMDL has been sent to EPA. However, because it is not economically feasible to remove 100% of the copper from the effluent, and because there is natural loading of copper in the watershed, some portions of the stream will probably not meet all criteria after treatment, although water quality to support fish should dramatically improve in much of the stream. AML is presently working on a proposal to plug the upper shaft above the mine tunnel. This could potentially reduce the volume of discharge from the mine. Therefore, EPA has not fully accepted the TMDL. Additional information on background (natural) concentrations of metals in tributaries and above the mine effluent is needed. Review of data during the TMDL process on Haggarty Creek revealed that copper criteria are also exceeded on the West Fork of Battle Creek, downstream of Haggarty Creek, so this stream was added to Table A of the 303(d) List. The treatment of the Ferris-Haggarty/Osceola Tunnel effluent is thought to be more than adequate to allow the West Fork of Battle Creek to meet standards. Haggarty Creek and West Fork of Battle Creek are Class 2AB streams and the impairments are due to priority pollutants. Because of these items, these creeks are given “high” priority for TMDL development.

DEQ has monitored water quality in the Little Snake watershed which indicates that aquatic life uses are fully supported on the portions of Savery Creek and North Fork Little Snake drainages within the National Forest and much of the upper watershed of Little Savery Creek. However, physical degradation of lower Savery Creek and West Loco Creek is threatening full aquatic life use support, and these streams are on Table C of the 303(d) List. Recently, a 319 watershed improvement project was completed by Little Snake River Conservation District (LSRCD). DEQ recognizes the restoration activities conducted Savery Creek watershed, and will review LSRCD data to determine if the threats have been mitigated and these waters warrant delisting. These waters are Class 2AB, but the threats do not represent a human health risk. However because such use support determinations have not been made and there was no commitment to develop a formal watershed plan during the scheduled plan development window, lower Savery Creek and West Loco Creek have a “medium” priority for TMDL development at this time.

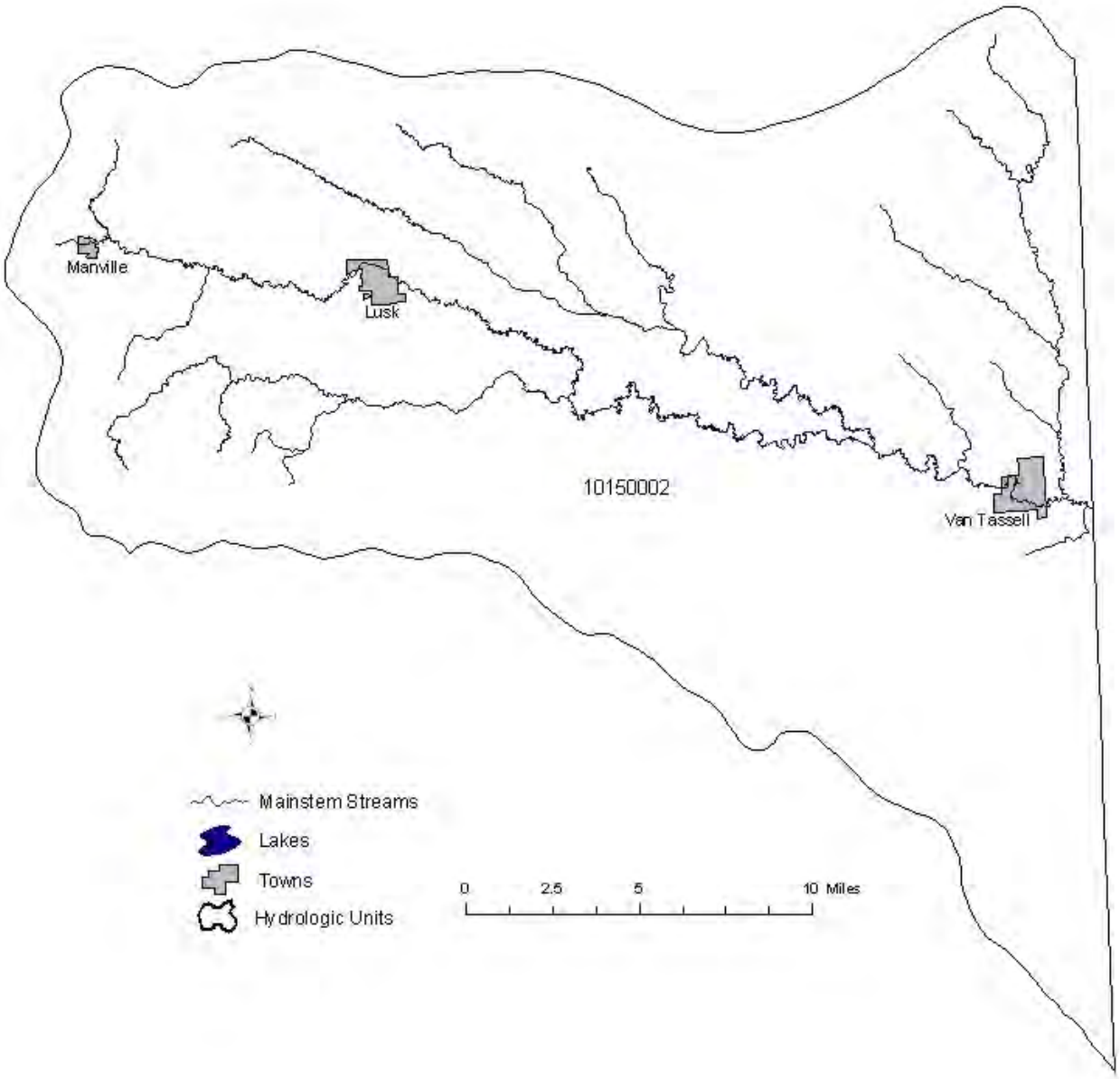
Muddy Creek Sub-basin (HUC 14050004)
The Muddy Creek Sub-basin includes all the tributaries to Muddy Creek, which flows into the Little Snake River at Baggs. Unstable stream channels and loss of riparian function have been a problem in much of the sub-basin. Muddy Creek below Littlefield Creek, and McKinney Creek below Eagle Creek are listed on Table C of the 303(d) List because physical degradation of the stream channels and riparian areas are considered threats to aquatic life uses. LSRCD has been working in a Coordinated Resource Management (CRM) process with the BLM, landowners, grazing permittees, WGFD, and other stakeholders, since 1992, to address these water quality and riparian habitat problems. As part of the CRM process, LSRCD has managed several 319 watershed improvement projects in the Upper Muddy Creek drainage. Implementation measures include upland water development, cross fencing, vegetation management and grazing

management, while maintaining livestock numbers. Other watershed function restoration has been implemented in the Grizzly Wildlife Habitat Management Area (WHMA), which includes the upper Littlefield Creek drainage and other portions of the upper Muddy Creek drainage. In the Grizzly WHMA,WGFD has been working with the BLM, the grazing permittee, and LSRCD to implement similar measures, however, the grazing strategy is to defer grazing for several years to allow better willow re-establishment. Data collected by LSRCD and WGFD indicate that implementation measures and management changes in both these projects have resulted in considerable improvement to stream stability, aquatic habitat, and riparian areas, especially in the upper Muddy Creek tributaries. Data collected by LSRCD show that Muddy Creek and Littlefield Creek above their confluence, and McKinney Creek above Eagle Creek are meeting their aquatic life uses, and these reaches were removed from Table C of the 303(d) List in 2000. Colorado River Cutthroat trout have been re-introduced into their former habitat in Littlefield Creek, and are planned to be re-introduced into Muddy Creek, above McKinney Creek.

Another project was implemented by LSRCD and other stakeholders on the reach of Muddy Creek, lying west of Highway 789, to address physical degradation of the stream channel, which threatens its aquatic life use support. This reach of Muddy Creek is also on Table C of the 303(d) List. Implementation measures include wetland development, re-establishment of the floodplain and irrigation water management. Results of this project show an improving trend in riparian condition and bank stability above Red Wash. However, habitat degradation has been identified by the BLM and LSRCD as a serious water quality concern on Muddy Creek, from Red Wash downstream to the Little Snake River. The habitat degradation is likely caused by season long riparian grazing, exacerbated by accelerated erosion associated with oil and gas activities. Several grazing management BMPs are being implemented in much of this lower watershed, including changes in length, timing and duration of grazing, and cross fencing. However, projected increases in coal bed methane development have the potential to lead to increased surface disturbance and possible increased erosion and sediment loading.

DEQ recognizes the restoration activities conducted in the Muddy Creek watershed, and will review LSRCD data to determine if the threats have been mitigated and these waters warrant delisting. These waters are Class 2AB, but the threats do not represent a human health risk. However because such use support determinations have not been made and there was ~~is~~ no commitment to develop a formal watershed plan during the scheduled plan development window, the waters listed on the 303(d) List have a “medium” priority for TMDL development at this time.

Niobrara River Basin

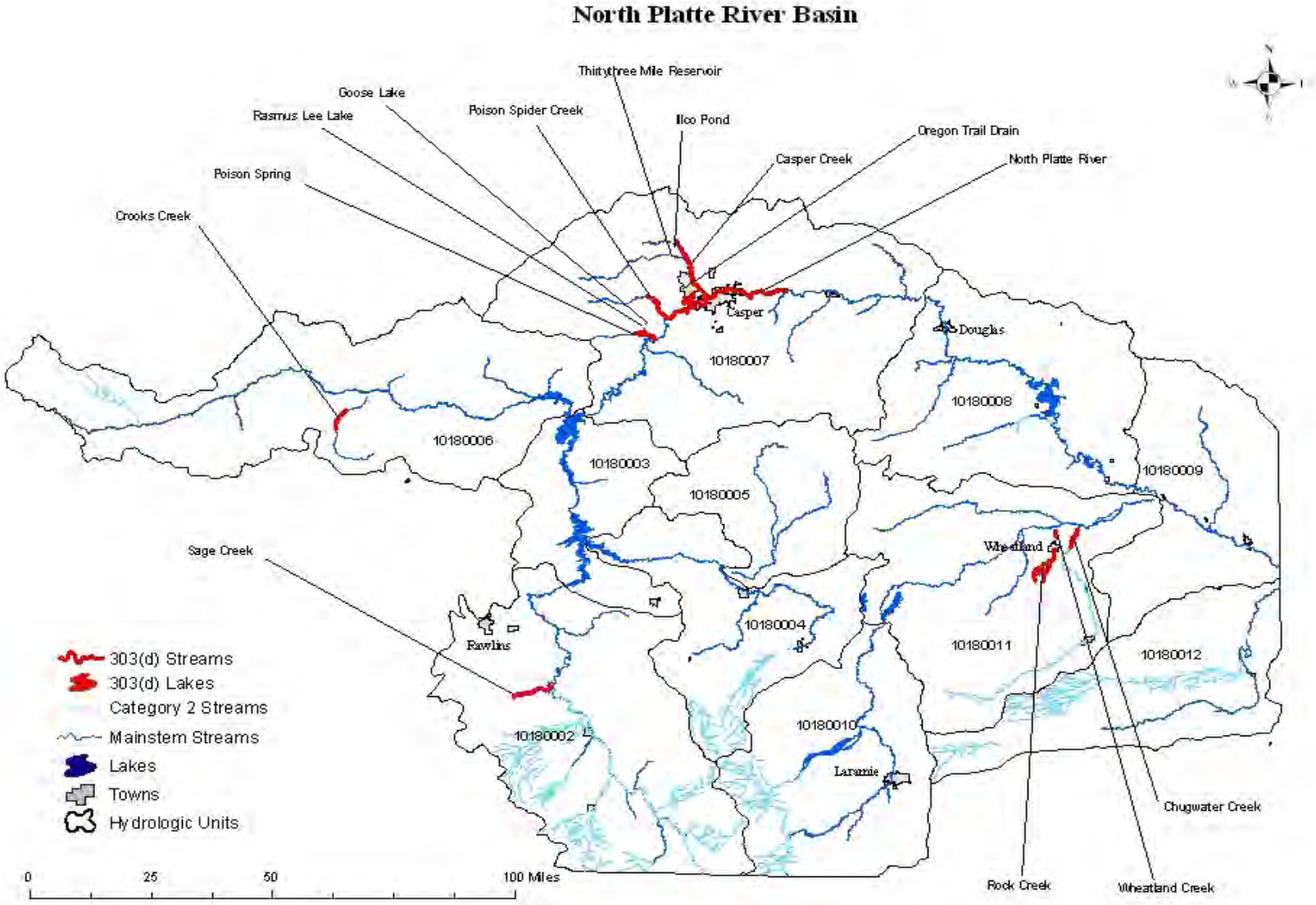


Niobrara River Basin

The Niobrara Headwaters Sub-basin is the only sub-basin in the Niobrara River Basin in Wyoming. Land uses are primarily grazing, with dryland and sprinkler irrigated crop and hay production. Sandy soils essentially prohibit flood irrigation and limit surface flow in streams.

Niobrara Headwaters Sub-basin (HUC 10150002)
Flows in a large stretch of the Niobrara River below Lusk apparently never flow above ground, even during recent catastrophic flooding upstream. The river channel is an undefined grassy swale. Further downstream flows surface and form an extremely slow moving, swamp-like stream, choked with bull rushes and cattails. Historical reports by local residents indicate that in the 1930s the lower stream channel was more defined and supported a population of trout. However, at that time, it appears that the Niobrara River had higher flows than today.

Niobrara CCD has conducted monitoring on Silver Springs Creek, however results of that monitoring were not available for this report (WACD, 2004).


North Platte River Basin
Thirtythree Mile Reservoir
Goose Lake
Rasmus Lee Lake
Poison Spider Creek
Ilco Pond
Oregon Trail Drain
Casper Creek
North Platte River
Poison Spring
Crooks Creek
Casper
Douglas
10180007
10180008
10180006
10180003
10180009
10180005
Sage Creek
Wheatland
10180004
Rawlins
10180011
10180012
10180010
Laramie
Chugwater Creek
Rock Creek
Wheatland Creek
303(d) Streams
303(d) Lakes
Category 2 Streams
Mainstem Streams
Lakes
Towns
Hydrologic Units
0
25
50
100 Miles

North Platte River Basin

The North Platte River originates in North Park in Colorado and flows into Wyoming from the south. Major tributaries in Wyoming include the Encampment, Medicine Bow, Sweetwater, and Laramie Rivers. Because it is dammed seven times before it enters Nebraska, both its flow regime and water quality characteristics have been significantly changed from its natural state.

All available water (under a US Supreme Court decree governing water use) within the North Platte drainage in Wyoming is allocated for beneficial use. Like the other rivers in the state, most of the allocated water is used for irrigation.

Trout never existed in the North Platte drainage until they were first stocked in the middle 1800's and now many areas in the basin are famous for their trout fishing opportunities. Walleye, the other principal game fish in the basin, have been stocked in Glendo Reservoir and several other smaller reservoirs. They are now abundant in all the mainstem reservoirs and many other off- mainstem reservoirs within the basin.

Upper North Platte Sub-basin (HUC 10180002)
The Upper North Platte Sub-basin is that area upstream of Seminoe Reservoir to the Colorado Line. Like most of the high elevation basins in Wyoming, most of the bottom lands are privately owned and irrigated for hay production. Generally, the uplands are grazed at lower elevations primarily early and late in the year, and the higher elevations are grazed in the summer.

Logging occurs mostly on Medicine Bow National Forest lands, and much of the forested area was historically harvested for railroad ties. Many of the larger mountain streams were straightened and had logs and boulders removed to facilitate tie driving.

There is some oil and gas production in the sub-basin, and Sinclair has an oil refinery. There are no large scale mining operations, but historically there has been considerable gold and copper mining in both the Sierra Madre and Medicine Bow mountains. DEQ's Abandoned Mine Lands Division (AML) has funded restoration projects in many of the mining areas within the sub-basin. Iron oxide was mined near Rawlins for use primarily as a paint pigment and has been applied on barns across the country. There has also been some limited coal mining in this basin, and gravel mines are scattered throughout.

Stream bank modification within the town limits of Saratoga, intended to reduce flooding, resulted in increased erosion in several other places as the river adjusted its channel. However, recent stabilization has been conducted with natural river processes in mind, which should reduce erosion. Natural hot springs in and near Saratoga slightly increase the temperature and dissolved solids content of the river. DEQ has conducted extensive monitoring on the mainstem of the North Platte River above Sage Creek and data indicates full support of aquatic life uses. However, there are reports that nutrient and sediment loads from Colorado may be increasing (WGFD, 2002). Monitoring of the reach above Seminoe Reservoir was conducted in 2002.

Tie driving probably occurred for a longer period of time on Douglas Creek than any stream in the state, continuing from the late 1860s until 1940, when the Union Pacific stopped the use of hand hewn, river driven ties. Devils Gate Creek was too steep and rocky to drive ties, so an extensive flume was built to carry ties and logs to Douglas Creek. Another impact in the Douglas Creek drainage was mining. Placer gold was first discovered near Keystone in 1868 and by 1870 hardrock ore bodies were also discovered and mined. Most gold production ceased by the 1890s, but copper was mined between 1900 and 1918. Today, a number of gold dredgers still operate in the watershed above the Platte River Wilderness boundary. Rob Roy Reservoir was completed in 1965 to regulate flows in Douglas Creek, where water is diverted via a pipeline to Lake Owen in the Upper Laramie River Sub-basin before it is piped further east to be used for a portion of Cheyenne's water supply. Since all the water is allocated in the drainage, water is simultaneously diverted from the Little Snake drainage into the Encampment River drainage to replenish water taken from the North Platte Drainage. Fish habitat structures, primarily tree revetments, have been installed in Douglas Creek to

improve aquatic habitat. Because of past mining, heavy metals were of concern in Rob Roy Reservoir, but monitoring conducted by United States Geological Survey (USGS) and the Cheyenne Board of Public Utilities as part of a 205j grant did not detect any high metal levels of concern for drinking water. Much of the lower watershed is in the Platte River Wilderness area, designated in 1984. Despite historic impacts to Douglas Creek, the reach within the wilderness has been monitored and assessed by DEQ as fully supporting its aquatic life uses as a cold water fishery and Class 1 water. Dredging and roads have been identified by the Forest Service as water quality concerns on Douglas Creek below Rob Roy Reservoir and above the wilderness boundary (MBRNF, 2003).

The watershed of Pelton Creek, which flows into Douglas Creek near the wilderness boundary, has been used as an example by the Forest Service of how good grazing management can improve water quality.

Based on Forest Service reports, impacts from historic mining are a concern on Bear Creek. DEQ has monitored this stream, but more metals data are needed to make a use support decision.

Roads and dredging were identified as water quality concerns on Smith North Creek, however monitoring conducted by DEQ indicates full aquatic life use support.

Much of the Muddy Creek drainage was cut for ties in the 1930s and remnants of an old splash dam for driving ties are still evident in the upper meadow. A road along most of the drainage was of concern and DEQ monitored and assessed the stream in 1998. Although a couple of road crossings contribute some sediment to the stream, their impacts are minimal and isolated, and the data indicates the stream meets its designated aquatic life uses as a Class 2AB water.

Much of the Cottonwood, Savage Run, and Mullen Creek Drainages lie within the Savage Run Wilderness Area. Although considerable timber harvesting has occurred in the drainages (both outside the wilderness and inside the present boundary prior to its designation in 1978) much of these drainages exhibit good riparian and streambank condition, based on observations by a DEQ biologist. Existing data and information do not suggest any water quality problems.

French Creek, Brush Creek, and Pass Creek were all modified to some extent for tie driving in the 1800s, and timber has also been recently harvested in these drainages, creating a fairly large network of roads. Much of the lower watersheds are irrigated via diversions from the streams. However, based on monitoring DEQ has conducted in the French Creek drainage, impacts from these sources, as well as historical placer and hard rock mining, do not appear to be affecting water quality. According to the Forest Service, streambank condition on Fish Creek, a tributary to North Brush Creek, is thought to have been impacted somewhat by season-long grazing, but a new grazing plan to reduce time of use intends to correct those impacts (MBRNF, 2004).

A large stakeholder driven watershed project was recently completed in the Cedar Creek drainage to address erosion problems from prior irrigation water delivery. North Brush Creek, Cedar Creek, and the South Fork of Cedar Creek are in a monitoring program conducted by the Saratoga-Encampment-Rawlins Conservation District (SERCD) associated with the project. An assessment report is expected in 2006.

Streams in the Big Creek Drainage are fully supporting aquatic life uses on most of the forest, based on DEQ and Forest Service assessments. Problems with sediment loading from forest roads has been recently addressed (MBRNF, 2003).

The Encampment River originates in the Mt. Zirkel Wilderness area in Colorado before it flows into Wyoming. Within a couple miles it flows into the Encampment River Wilderness Area. Assessment by DEQ indicates full aquatic life use support in the Encampment River and North Fork Encampment River. Flows are augmented in the Encampment River drainage due to a trans-basin diversion of water from the Little Snake drainage into Hog Park Reservoir for replenishing the North Platte water that Cheyenne diverts out of Douglas Creek. The increased flows in Hog Park Creek did cause some initial channel adjustment after the reservoir was completed in 1965, but the stream appears to be stabilizing. South Hog Park Creek

was tie driven and carried a large sediment load and was unstable, so tree revetments were installed to help the stream establish a more natural shape and to improve the fishery. But the revetments were being removed by beaver for dam building because dams built with the small available willows could not withstand high spring runoff. Aspens are now being cut and hauled to the beaver so they will utilize the aspens instead of the revetments, so both can work to trap the sediment and restore the stream. Assessment by DEQ indicates South Hog Park Creek is fully supporting its aquatic life uses.

The North Fork of the Encampment River is the drinking water source for the Town of Encampment. Potential development of a Green Mountain resort and mountain community within the watershed resulted in the Town of Encampment obtaining Section 205(j) assistance funds to develop a Source Water Protection Plan. Additional monitoring and assessment work is a component of that project. The project expired in October 2005 and a project final report was not received in time for this report.

A diversion ditch in the Billie Creek drainage breached in the late 1990s, which eroded a gully and deposited approximately 3300 tons of sediment in Billie Creek and its flood plain. Restoration work on the gully was completed in 2001 to curtail erosion. Billie Creek was monitored in 2003, and initial data analysis indicates a healthy biotic community.

A 1984-86 AML remediation project removed a large (approximately 65,000 cubic yards) tailings pile generated by the mill and smelter in Encampment during the early 1900s, which reportedly resulted in considerable water quality improvement in the river. DEQ has conducted extensive monitoring in the drainage, and the majority of the stream miles are fully supporting their aquatic life uses.

Assessments conducted by DEQ in the upper Jack Creek drainage indicate it is supporting its aquatic life uses, as is upper Spring Creek. The BLM recently changed grazing management on portions of Centennial Creek to improve riparian condition. SERCD has conducted monitoring on Jack Creek, below the National Forest, and the data indicate it is also fully supporting its aquatic life uses.

Sage Creek has a naturally high sediment load due to the highly erosive soils and arid climate in much of the watershed. It has been identified by several studies as the most significant contributor of sediment to the Upper North Platte River and is on Table C of the 303(d) List (WGFD, 1969; SCS, 1980; SERCD, 1998). Additionally, dam failures, road building, and past grazing practices have resulted in increased erosion and sediment loading, especially from the lower portion of the watershed. In 1997, SERCD, in cooperation with land owners, BLM, NRCS, and WGFD, began the Sage Creek Watershed 319 project, which now encompasses the entire watershed. The project is using a combination of short duration grazing, riparian and drift fencing, off channel water development, improved road management, grade control structures and water diversion and vegetation filtering to reduce sediment loading from Sage Creek to the North Platte, and to improve water quality within Sage Creek. Data collected as part of the project already show reduced sediment loading to the North Platte River and improved riparian and range condition. The Section 319 project is slated to expire in December 2005. SERCD has submitted “credible data” for a Use Attainability Analysis on Sage Creek. Because of this submittal, the priority for TMDL development is “low.” Complete assessment data and interpretation review of the project final report and UAA request will ultimately determine the use support and TMDL development status of Sage Creek.

Hugus and Iron Springs Draw drainages are Class 3B waters, with intermittent to ephemeral stream channels. According to the BLM, new and developing AMPs are expected to result in improved watershed condition. Sugar Creek flows through Rawlins and enters the North Platte just upstream of Seminoe Reservoir. Rawlins’ waste water treatment plant discharges to Sugar Creek, but the stream rarely flows all the way to its confluence with the North Platte River.

Pathfinder-Seminoe Sub-basin (HUC 10180003)

In the Pathfinder-Seminoe Sub-basin, North Platte River flow is regulated by Seminoe, Kortes, and Pathfinder Reservoirs. The sub-basin includes those areas, other than the Sweetwater and Medicine Bow Rivers, which drain into the North Platte River, or its reservoirs, between Pathfinder dam and the head of Seminoe Reservoir. Primary land uses in this sub-basin are grazing, irrigated hay production, coal mining

and recreation. Underground coal mining began in the Hanna-Elmo area in the late 1860s to supply fuel for the transcontinental railroad, and resulted in extensive underground coal workings created over a period of years. AML completed three remediation projects in the Hanna area, which corrected the erosion and standing water impacts associated with coal slag piles and almost 200 coal mine related subsidence holes. Current coal mining activities are thought to have little impact on the water quality in this sub-basin or the Medicine Bow Sub-basin (HUC 10180004).

Pathfinder dam was completed in 1909, and provided the first regulation of flows on the river. Reservoirs also trap sediment and lower average water temperature, so the natural flow characteristics of the North Platte have not existed since then. An extremely productive tailwater fishery resulted after Seminoe Dam was completed in 1939, and was given the name Miracle Mile. Completion of Kortes Reservoir below Seminoe dam shortened the Miracle Mile area, but with the establishment of instream flow releases, it is still considered a premiere blue ribbon fishery.

Deweese Creek, which flows into Pathfinder Reservoir, is one of the few perennial streams in this sub-basin and is considered by DEQ as a reference stream for sand bottom streams in the Wyoming Basin Ecoregion.

Medicine Bow Sub-basin (HUC 10180004)
The headwaters of the Medicine Bow Sub-basin are on the north slope of the Snowy Range. Water quality characteristics change drastically as the streams flow from the metamorphic geology of the mountains through the easily erodible, fine grained sedimentary geology of the basin. This sub-basin drains into Seminoe Reservoir. Land uses include logging in the mountains, grazing, irrigated hay production, recreation, coal mining, and oil and gas development. Coal bed methane development is beginning in the watershed. Irrigation in the Medicine Bow River drainage (including Rock Creek) dates to at least 1870-1880, the time of railroad construction. The transcontinental railroad reached this area in 1868 and coal production began in 1869 near Carbon to supply fuel for the railroad. AML has completed ten site investigations in this sub-basin, most related to coal and gravel production, and completed remediation of one early 1900s coal mine.

Water quality assessments conducted in the upper Medicine Bow River drainage above the town of Elk Mountain indicate full support of aquatic life uses. Extensive monitoring by DEQ, as well as several agencies and universities, also indicate full aquatic life use support in the Rock Creek drainage above McFadden. The Medicine Bow Conservation District has conducted considerable monitoring in the lower portion of this sub-basin as part of a 205j monitoring study, however, data did not meet QA/QC requirements to be used for use support determination.

Little Medicine Bow Sub-basin (HUC 10180005)
The Little Medicine Bow Sub-basin drains the northwestern edge of the Laramie Mountains and the Shirley Basin. Land uses are primarily grazing and oil and gas development, together with historic uranium mining (1955 to the early 1980s). AML completed reclamation of about 1,650 acres of open pit uranium mines in Shirley Basin. The Little Medicine Bow River originally flowed through the uranium ore location. During mining operations in 1972, the river was diverted to the east and shortened. The unstable new channel had down cut as much as fifty feet and drastically increased the sediment input to the drainage system. During reclamation the river channel was restored to its former location and pre-mining condition, with stabilized, revegetated banks and a revegetated riparian area. Eroding radioactive mine waste piles which also contained elevated levels of selenium and heavy metals were removed. Leaching and runoff water from these waste piles had been impacting surface and ground water quality. Reclamation improved water quality and reduced off-site sediment transport. The Medicine Bow Conservation District has monitored the Little Medicine Bow River as part of a 205j monitoring study, however, data did not meet QA/QC requirements to be used for use support determination.

Sweetwater Sub-basin (HUC 10180006)
The Sweetwater Sub-basin headwaters are in the South Pass area of the southern Wind River Mountains. The Sweetwater River is designated as a Class 1 water above Alkali Creek. Land uses in this sub-basin include grazing, irrigated hay production, historic gold and iron mining in the South Pass area, uranium

mining in the Jeffrey City area, recreation, and oil and gas development.

At the western end of the sub-basin, AML has remediated and/or stabilized over 100 sites in the old Atlantic City - South Pass mining districts. The Clarissa Mine site, a gold mine which operated from the late 1860s to the early 1970s, included a tailings pond and pile in a perennial tributary to Willow Creek near South Pass City. Approximately 7,000 cubic yards of tailings and contaminated subsoil were removed from the drainage, including clearing 1,200 feet of stream channel. The tailings appear to have caused elevated levels of arsenic, cyanide, and mercury in stream sediments and soils, however sampling by BLM and DEQ show relatively low levels of these contaminants in the water column in Willow Creek. Therefore the sediment mercury does not appear to affecting water quality but could have a greater impact if the sediments were disturbed by dredging activity. Fish tissue sampling by WGFD show mercury levels below the FDA guideline action limit in filets but higher than the limit in gut tissues. This would not suggest a human health concern, but it could suggest a concern for piscivorous wildlife. DEQ assessment of Willow Creek shows full support of aquatic life uses.

Ambient monitoring of Crooks Creek, a tributary to the Sweetwater River near Jeffrey City, revealed a significant amount of oil in the sediments, in violation of water quality standards. The source of the oil is unknown at this time, but this stream is a high priority targeted water on Table A of the 303(d) List, and is scheduled for TMDL development.

Middle North Platte Sub-basin (HUC10180007)
The Kendrick Reclamation Project takes water out of Seminoe and Alcova Reservoirs for irrigation northwest of Casper. However, much of the irrigated soil contains naturally high levels of selenium, which is readily dissolved and transported by the irrigation water. Extensive studies by the U.S. Geological Survey (USGS), US Fish and Wildlife Service (USFWS), and the Bureau of Reclamation (BR) have determined the irrigation return flows contain high levels of selenium which result in selenium loading into the North Platte River and several streams, wetlands, and reservoirs within the project area. These loadings have resulted in numerous water quality criteria exceedences in the higher class waters (North Platte River, Casper Creek, and lower Poison Spider Creek) as well as documented impairments to wildlife in these and other waters within Kendrick (Oregon Trail Drain, Poison Spring Creek, Goose Lake, Rasmus Lee Lake, Thirtythree Mile Reservoir, and Illco Pond). These waters have all been listed on Table A of the 303(d) List since 2000. An infrastructure repair project has been designed to improve the water quality in Goose Lake, Rasmus Lee Lake, Thirtythree Mile Reservoir, and Illco Pond to protect migratory birds, and these waters have been given a low priority for TMDL development. The Natrona CCD uses 319 funding to monitor selenium and implement management practices to reduce selenium levels. These practices include increasing irrigation efficiency, and enhanced irrigation water efficiency through canal and lateral lining and piping. The Kendrick Watershed Steering committee submitted a watershed plan to DEQ in 2005.

Glendo Sub-basin (HUC 10180008)
The Laramie Mountains border the Glendo Sub-basin on the southwest. This sub-basin includes all the drainages entering the North Platte River below LaPrele Creek (above Douglas) and above the Fort Laramie Canal (below Guernsey). North Platte water flow is regulated by Glendo and Guernsey Reservoirs. Primary land uses are grazing, irrigated agriculture, oil and gas development, and scattered gravel and limestone quarries.

Sunrise Mining District is located east of Hartville Canyon in a tributary drainage of the North Platte River. Copper mining began in the 1870s; long term iron mining in the district began in the 1890s. An AML reclamation and remediation project in the Sunrise Mining District remediated multiple water quality impacts from the mining.

Guernsey Reservoir is the site of the annual Guernsey silt run, an exception to the state turbidity criteria. After Guernsey Reservoir was completed in 1927, water released from the reservoir was described as practically sediment-free and is believed to have removed years of silt accumulation which had acted as a water seal in irrigation canals, and led to seepage and bank collapses which in turn impeded water flow. The practice known as the annual silt run was first tried in 1936 as an attempt to deliberately remove

accumulated sediment from Guernsey Reservoir and put enough silt and sediment into irrigation canals to seal them and prevent further erosion. The silt run took place approximately once each year from 1936-1957 by a planned flow reduction from Pathfinder and subsequent drawdown of Guernsey. Glendo Reservoir, built between Pathfinder and Guernsey, was completed in 1958. Glendo functioned as a second sediment settling area for water entering Guernsey, with the result that water releases from Guernsey were referred to as "crystal clear." The 1958 irrigation season was carried out without a silt run, but the practice was reinstated in 1959 and has been implemented each year since. The annual complete drawdown of Guernsey Reservoir, usually after July 4, takes about ten days and moves a significant amount of sediment out of the reservoir and into the downstream irrigation canals with return flow into the North Platte River. As a result of actions begun in 1983, the annual Guernsey silt run has been authorized in Wyoming turbidity standards.

Horseshoe Creek (Class 2AB) originates in the Laramie Range and flows east/northeast to its confluence with the North Platte River just below Glendo Reservoir. Monitoring was conducted by DEQ in the lower nine miles (from about 2.5 miles upstream of Spring Creek downstream to the North Platte River). Results of that monitoring indicate the lower 2 miles, and from Spring Creek upstream an undetermined distance above Section 26, T29N, R69W are fully supporting their aquatic life and fisheries uses. However, habitat degradation and lack of perennial flows from Spring Creek downstream approximately 4.5 miles prevent Horseshoe Creek from attaining similar aquatic life and fisheries use for most of this reach. The habitat degradation appears to be primarily related to changes in flow regime in this reach, but heavy grazing in some areas may compound the problem. Because legal flow depletion is considered pollution, but not a pollutant, this reach of Horseshoe Creek does not require a TMDL at this time.

Lower North Platte Sub-basin (HUC 10180009)
In Wyoming, this sub-basin includes the drainages, other than the Laramie River, which enter the North Platte River from the Fort Laramie Canal diversion downstream to above the confluence with Horse Creek (in Nebraska). Primary land uses are irrigated agriculture, dryland farming, and grazing.

Upper Laramie Sub-basin (HUC10180010)
This sub-basin includes all the drainages above Wheatland Reservoir #2. Major drainages in the Upper Laramie Sub-basin are the Laramie and Little Laramie Rivers whose headwaters are in the Medicine Bow Mountains. Land uses are logging, recreation, and grazing at higher elevations; grazing, irrigated hay production, and some oil and gas development in the lower elevations. The City of Laramie (third largest in Wyoming) lies in this sub-basin.

Extensive water quality assessments by universities, the Forest Service, and DEQ in the Little Laramie Drainage above Millbrook indicate that the majority of the streams and lakes are meeting their aquatic life uses.

Water quality monitoring by DEQ in 1997 on the Big Laramie River also indicated full aquatic life use support above Jelm.

Water Quality samples are collected by Laramie Rivers Conservation District during spring runoff on the Big and Little Laramie Rivers, for the past several years. The data show occasional high counts of fecal bacteria, but the geometric mean criterion has not been exceeded, however initial review of 2005 data indicate possible standards exceedences. Data from other times of the year were not collected. Because of the occasional high numbers further monitoring is recommended during both runoff and low flow conditions to determine if a fecal contamination problem exists.

Lower Laramie Sub-basin (HUC10180011)
This sub-basin runs from Wheatland Reservoir #2 downstream to the confluence with the North Platte River. Land uses include irrigated agriculture, grazing, dryland farming, and some logging in the Laramie Range.

Ammonia levels in Wheatland Creek often exceed water quality criteria in the winter and spring, indicating that aquatic life uses are not fully attained. Monitoring indicates Wheatland's waste water treatment facility is a primary source of ammonia and a TMDL has been approved by EPA. Although still partially impaired,

Wheatland Creek is not listed on the 303(d) list for ammonia because of the approved TMDL. The City of Wheatland is working with DEQ/WQD on the installation of a non-discharging treatment system to address this issue.

Concerns expressed by several residents prompted DEQ to begin monitoring fecal coliform in the Wheatland/Rock Creek drainage. Results of this monitoring indicate that Rock Creek and a portion of Wheatland Creek for an undetermined distance above and below Highway 320, are not at reducing fecal contamination will occur concurrently with the planning process. Four animal feeding operation projects and three septic rehabilitation projects are being planned in the Rock Creek drainage (WACD, 2004).

Assessments conducted by DEQ along the length of Chugwater Creek indicate the stream appears to meet its designated aquatic life uses as a Class 2AB water above Antelope Gap Road west of Wheatland, although nutrients are a concern. However, the assessment indicated the physical and biological character of the stream dramatically changes in a monitored reach several miles below the road. The stream bed changes to a mobile sand bed which supports very little aquatic life (less than half the number of taxa, and less than one percent of the number of individuals, compared with upstream reaches and other similar streams). WGFD fish data show similar reductions in fish numbers. Because of the mobile sand bed and the huge reduction in aquatic life, this reach of Chugwater Creek was listed as threatened on the 303(d) List in 2000. Platte County Resource District (PCRD) conducted monitoring on Chugwater Creek in 2000 and 2001 to verify the DEQ threatened listing. The PCRD study has allowed the downstream endpoint of the threatened reach to be better defined. The listed reach has changed to: from the irrigation diversion in NE SW S26 T25N R67W upstream an undetermined distance below Antelope Gap Road. PCRD data also show very high nitrate levels in Chugwater Creek, approximately 10 times higher than recommended concentrations for streams which ultimately flow into reservoirs. Affects of this nutrient loading on Gray Rocks Reservoir, downstream of Chugwater Creek on the Laramie River, are unknown and warrant further assessment. Cooperative efforts with landowners, sponsored by WGFD and Pheasants Forever, to improve riparian condition to benefit wildlife have been implemented along this portion of the creek. Additionally, the irrigation district has since built a small reservoir on the bench above the creek to improve irrigation efficiency by capturing excess irrigation water which used to flow down a draw into Chugwater Creek. While both these projects were not specifically designed to benefit water quality, DEQ believes that they will dramatically reduce sediment loading and bed transport.

The DEQ and PCRD most-downstream monitoring locations are separated by approximately 1/2- mile of stream channel. Within this zone of separation is an irrigation diversion point. The two parties have disagreed on the representativeness of each other's monitoring location in characterizing the aquatic life use support in the stream reach immediately upstream of the irrigation diversion. The PCRD petitioned the department's Water and Wastewater Advisory Board to have Chugwater Creek removed from the Threatened List based on the PCRD monitoring data. The Advisory Board heard both sides of the issue in January 2006. The board made two recommendation: 1) a majority of the board felt the existing information warranted removal of Chugwater Creek from the Threatened List; 2) following this recommendation, the board then recommended that both parties, along with a mutually-agreed upon independent third party, meet on-site to review watershed conditions and arrive at a location-appropriate and up-to-date watershed assessment.

The department saw the two recommendations as being somewhat conflicting. If the information presented to the board had resulted in an overwhelming recommendation for immediate delisting of Chugwater Creek, the second recommendation for an independent third party assessment would most likely not have been carried forward. The department also has concerns that delisting the stream based on the board's recommendation has real potential to directly conflict with the state's "Credible Data" statute and state and federal regulations. Because of these, the department has elected to follow the board's recommendation to cooperatively proceed with the independent third party mediated evaluation of the reach. While this is being completed, the department feels it has the statutory obligation to keep Chugwater Creek on Table C as a Threatened water. The priority for TMDL development will be "low" to reflect the need to collect complete, up-to-date, and comprehensive data that is reviewed by a qualified, independent third party.

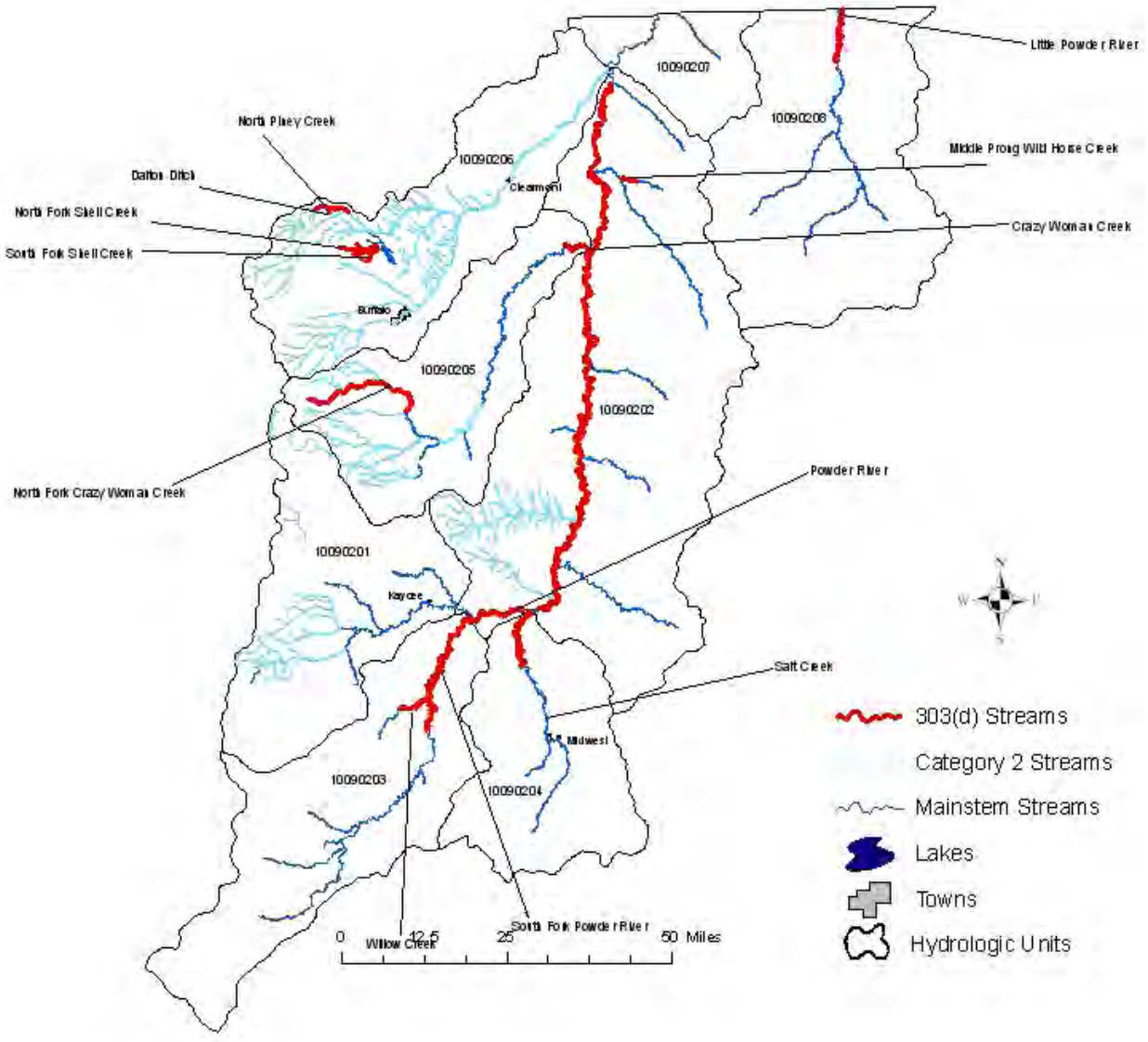
The Tunnel Reservoir on the Laramie River dams up water so it can be diverted through a tunnel into Bluegrass Creek to supply irrigation water in the Sybille Creek drainage. The reservoir is drained in the fall to prevent damage of the gates at the head of the tunnel. Because the reservoir was designed to release water from the bottom, the annual fall drawdown often discharged anoxic sediment from the bottom of the reservoir which resulted in fish kills downstream in the Laramie River. In 1997 reservoir modifications were made which allow the water to be released without disturbing the accumulated sediment.

Horse Creek Sub-basin (HUC 10180012)

Head waters of the Horse Creek Sub-basin are in the Laramie Mountains. Land uses are primarily grazing and irrigated hay production, with considerable dryland and irrigated cropping at lower elevations. Underground limestone mining occurred in the upper reaches of the watershed. AML has completed reclamation work at this site, including the rerouting of surface waters to prevent flows into the mine workings.

Watershed assessments on upper Horse Creek show that aquatic life uses are fully supported. Watershed assessments were conducted by DEQ on Bear Creek and the South and North forks of Bear Creek in 1999, which indicate the streams are meeting their aquatic life uses, however, elevated temperature is a concern in the lower watershed since the stream is protected by water quality standards as a cold water fishery. WGFD manages lower Horse Creek as a warm water fishery.

Powder River Basin



Powder River Basin

The Powder River flows north from Central Wyoming into Montana. Nearly all of the naturally perennial streams which reach the Powder River originate in the Bighorn Mountains. The core of the Bighorn Mountains is composed of igneous and metamorphic rocks flanked by mostly well-indurated sedimentary rocks. The water quality of mountain streams is generally high quality, except in isolated areas where land use practices have led to excessive erosion and sediment loading. In the Powder River geologic basin away from the mountains, the geology consists of primarily fine grained sedimentary strata which are often high in dissolved constituents and most formations are easily eroded. Streams originating in the basin terrain, unless receiving discharge water, are generally ephemeral, flowing only in response to snowmelt and rainfall events. These streams are generally high in dissolved solids picked up from the soils and are often turbid due to the nature of the geology and thin soils. Because of these natural conditions, site specific criteria have been adopted and the numeric human health criteria for manganese and iron do not apply in most Class 2 waters originating in the Powder River geologic basin. The Powder River Basin contains aquatic communities and certain fishes, such as the sturgeon chub - a former candidate for listing under the Endangered Species Act, which are adapted to living in naturally turbid conditions (Patton, 1997). Although effects of CBM development on these aquatic biota are unknown at this time, DEQ, WGFD, and USFWS have concerns that these aquatic communities may be affected.

Middle Fork Powder Sub-basin (HUC 10090201)
The upper Middle Fork of the Powder River flows through a steep canyon with little potential for disturbance. Watershed assessments conducted by DEQ indicate that the Middle Fork Powder River above Buffalo Creek, and Rock Creek, an upper tributary, are fully supporting their aquatic life uses. Near Barnum, Blue Creek, and upper Beaver Creek (above the Blue Creek confluence) have been assessed by DEQ and have been determined to be fully supporting their aquatic life uses.

Beartrap Creek is a spring fed tributary of Red Fork, and historically, the upper Beartrap Creek drainage has been used as a stock driveway and holding ground. Management practices have changed over the past twenty years. Today, stock have controlled access to creek water, are moved through relatively quickly, and are only in the drainage for a short time in spring and fall. In a cooperative effort between BLM and WGFD, log spill structures were installed in 1989 to create additional pool and riffle habitat. Bioassessments conducted by DEQ show that both upper Beartrap Creek and Sawmill Creek are fully supporting their aquatic life uses.

Webb Creek is a class 2AB tributary to the North Fork of the Powder River. Assessment by DEQ indicates is fully supports aquatic life uses.

Upper Powder River Sub-basin (HUC 10090202)
The Upper Powder Sub-basin encompasses most of the drainages into the Powder River main stem from the confluence of the North and Middle Forks downstream to the confluence of the Powder River and Clear Creek. Except for the main stem, most reaches in this semi-arid sub-basin are non-perennial. The Powder River got its name from the large amounts of very fine sediment it naturally carries. Sturgeon chub, a native fish considered rare by WGFD and now found only in the Powder River, are believed to be adapted to, and require, turbid water. Primary land uses are grazing, coal bed methane, and oil and gas production.

Pumpkin Creek is classified as Class 3B, and was monitored by DEQ in 1998. Assessment of that data showed that Pumpkin Creek was an ephemeral to intermittent stream that was supporting its aquatic life uses. However, since then, coal bed methane (CBM) development has started in the watershed. As part of the watershed based permitting process, physical data was collected in the Pumpkin Creek drainage, in part to determine how much additional flow from CBM discharges the Pumpkin Creek drainage could handle without degradation. This monitoring showed that parts of the drainage now have perennial flows which reach to the Powder River, and also identified areas of severe erosion as well as a number of active headcuts. The earlier data collected by DEQ can no longer be considered representative of current conditions. Consequently, the determination that Pumpkin Creek was fully supporting its aquatic life uses can no longer

be considered valid, and it has been removed from Category 2.

Likewise, Fortification Creek was monitored by DEQ in 1999, prior to CBM development, and showed full aquatic life use support at that time. However, due to recent CBM development in the watershed, that assessment may not be current.

Ninemile and Fourmile Creeks, near Sussex, are ephemeral class 3B tributaries to the Powder River. Dikes and small impoundments trap and help support riparian vegetation. Assessments by DEQ indicate full aquatic life use support in these watersheds.

The Powder River below Salt Creek was listed on the 1998 303(d) List for exceedences of the chloride criteria. Analysis of data show that the majority of the chloride load in the Powder River in this reach comes from Salt Creek. More extensive data collection has occurred on the Powder River and its tributaries as part of the overall assessment of coal bed methane development on the river system. These data indicate that the chloride impairment extends downstream to the confluence with Clear Creek. The relatively low chloride concentrations found in Clear Creek effectively dilute the Powder River at this point to enable the river to meet chronic chloride criteria. A Use Attainability Analysis with credible data requesting site specific chloride criteria on the Powder River has been submitted to DEQ. This UAA request results in the priority of TMDL development for chloride on the Powder to be "low."

Data collected at Sussex also shows exceedences of the selenium criteria, so selenium was added as an impairment on Table A of the 303(d) List in 2000. More extensive data collection has occurred on the Powder River and its tributaries as part of the overall assessment of coal bed methane development on the river system. These data indicate that the selenium impairment extends downstream to the confluence with Crazy Woman Creek. The relatively low selenium concentrations found in Crazy Woman Creek effectively dilute the Powder River at this point to enable the river to meet chronic selenium criteria. Historic USGS data and Powder River Conservation District (PRCD) data indicates the source of the selenium is the South Fork of the Powder River drainage, however, it is undetermined whether the selenium loading is natural or human induced.

The Powder River Conservation District (PRCD) has received a 319 grant to conduct further water quality assessment and begin implementation once sources are discerned. PRCD has recently made a formal commitment to sponsor watershed planning efforts on the Powder River in lieu of the development of a TMDL. Because of this formal commitment, the applicable waters have been given a "low" priority for TMDL development at this time.

South Fork Powder Sub-basin (HUC 10090203)

The South Fork Powder Sub-basin lies mostly in Natrona County, extending into the Waltman area. The few perennial reach miles in this sub-basin are primarily in the Rattlesnake Hills headwaters area of Wallace Creek, the lower portions of Willow and Cottonwood Creeks and the lower portion of the South Fork main stem. Cave Gulch and Okie Draw flow perennially due to oil field discharges. Grazing and oil and gas development are the primary land uses.

Data collected by USGS and Powder River Conservation District (PRCD) show chronic exceedences of the selenium criteria in the South Fork Powder River from the mouth up to an undetermined distance above Willow Creek. Willow Creek also exceeds the selenium criteria. The source of the selenium appears to be primarily due to the natural geology of the area, but anthropogenic loading can be a factor when these lands are irrigated, which dissolves extra selenium from these marine shales. Both of these waters have been added to Table A of the 303(d) List. Increased selenium loading below Willow Creek also suggests that Posey Creek, and possibly other tributaries, are contributing selenium to the system. PRCD will be conducting additional monitoring under a Section 319 project in 2006 to further understand loading sources.

Salt Creek Sub-basin (HUC 10090204)

Midwest and Edgerton lie almost in the center of the Salt Creek Sub-basin. Land uses are primarily grazing and oil and gas production. Several natural oil seeps have been documented along Salt Creek in the Midwest

area, which led to development of the oil fields beginning in 1908. Most reaches in this semi-arid sub-basin are non-perennial. Salt Creek now has perennial flow due to discharge water from oil treaters, but reportedly is naturally non-perennial. Soils developed from fine grained sandstone and calcareous shales, are dry and easily eroded by wind or water.

Salt Creek is classified as class 2C, a non-game fishery. Salt Creek naturally carries a high load of salts, hence its name. However, because of the high chloride concentrations in the creek, it exceeds the criteria for protection of aquatic life, and is listed on Table A of the 303(d) List. Studies conducted by PRCD confirm that the vast majority of perennial flow and chloride loading to Salt Creek and the Powder River are from discharge water associated with oil production. Salt Creek remains on Table A of the 303(d) List for chloride. A Use Attainability Analysis with credible data requesting site specific chloride criteria on Salt Creek has been submitted to DEQ. This UAA request results in the priority of TMDL development for chloride on Salt Creek to be "low."

Salt Creek was also on the 303(d) List of threatened waters due to a high number of produced oil and water spills in the watershed, due primarily to the age of the oil production infrastructure. Most of this infrastructure dates to the 1960's, and spills are due primarily to a combination of the age of the infrastructure and bacterial corrosion in the injection lines. Although most of those spills usually do not make it to live water, some do. At the request of DEQ, the current operator of the field has developed a long term upgrade and maintenance plan for the field to reduce the potential for large spills that may affect the water. The operator is also phasing into CO2 flood (injection of CO2 to enhance oil recovery) which requires replacement of both injection and production lines. They are also upgrading water flood lines and since 2003 have been using biocide treatment field-wide to reduce bacterial corrosion. Because oil production is regulated by a variety of environmental laws to protect from such spills, and because a TMDL would do not reduce chances of spills, Salt Creek has been removed from Table C of the 303(d) list as threatened from oil spills and placed in Category 4B.

Crazy Woman Sub-basin (HUC 10090205)
Headwaters of the Crazy Woman Sub-basin are on the east side of the Big Horn Mountains. Land uses are primarily oil and gas development, recreation, grazing, and irrigated agriculture.

The North Fork of Crazy Woman Creek is listed on Table C of the 303(d) List due to water quality threats from physical degradation of the stream channel. Several 319 watershed improvement projects have been conducted in this watershed which changed both irrigation and grazing practices in large portions of the watershed. Considerable water quality data has been gathered in this watershed, however, it is inconclusive whether these practices have benefited water quality due to inconsistent sampling and implementation of best management practices within the watershed (BIO-WEST, 2001). DEQ conducted monitoring in the North Fork watershed in 2003, however, assessment to determine the effects the 319 projects had on improving water quality has not been completed. DEQ recognizes the restoration activities conducted in the North Fork watershed, and will review the 2003 data to determine if the threats have been mitigated and these waters warrant delisting. These waters are Class 2AB, but the threats do not represent a human health risk. However because the use support determinations have not been made and there was no commitment to develop a formal watershed plan during the scheduled plan development window, the North Fork Crazy Woman Creek has a "medium" priority for TMDL development at this time.

USGS data collected near the mouth of Crazy Woman Creek indicate it is exceeding the aesthetic drinking water criteria for manganese, and the creek has been added to Table A of the 303(d) List. The manganese concentrations in Crazy Woman Creek do not appear to be high enough to present a health threat but can cause discoloration of the water. It is likely that the high manganese concentrations are due to the natural geology of the area, and a site specific criteria is being considered. DEQ collected dissolved manganese samples from Crazy Woman Creek during high and low flow periods in 2003. The complete credible data set is not yet available for any potential UAA assessment, therefore the priority for TMDL development is "medium" at this time.

Many of the streams in this watershed have been monitored by DEQ, and assessment of the data indicate that

the following streams are fully supporting their aquatic life uses:

Crazy Woman Creek (from confluence of North and Middle Crazy Woman down to approximately 2 miles below Wallows Creek)
Little North Fork Crazy Woman Creek
Pole Creek (tributary to North Fork Crazy Woman Creek)
Poison Creek (tributary to North Fork Crazy Woman Creek)
Middle Fork Crazy Woman Creek
Doyle Creek (above Taylor Creek)
South Fork Crazy Woman Creek
Beaver Creek
Pole Creek (tributary to Beaver Creek)
Billy Creek (tributary to Muddy Creek)

Clear Creek Sub-basin (HUC 10090206)
Headwaters of Clear Creek, Piney Creek, and Rock Creek are in granitic geologic materials in the Cloud Peak Wilderness area within the Bighorn National Forest. Recreation, grazing, and logging are land uses within the higher elevations. Grazing, oil and gas development, irrigated agriculture and residential development are the primary land uses. Clear Creek is the last major tributary to join the Powder River before the Wyoming-Montana state line.

A 205j water quality assessment project in the Rock Creek and North and South Fork Shell Creek drainages indicated that these watersheds are threatened by physical degradation of the stream channel. The primary degradation to Rock Creek has been identified as heavy grazing in small horse pastures. Data collected and analyzed by DEQ indicate that aquatic life uses are supported in Rock Creek, however, there are areas where intensive land uses can threaten use support. Impacts to the North and South Fork Shell Creek drainages are primarily due to irrigation diversions and conveyance. Lake DeSmet Conservation District recently completed a 319 grant which addressed these problems primarily through installation of more efficient irrigation and irrigation delivery systems. Data collected as part of the project were inconclusive, with the wide variability in the biological data observed between sample years potentially being the result of inadequate sample sizes. North and South Fork Shell Creeks are listed on Table C of the 303(d) List. A field visit to the watershed in 2005 suggested the implementations on the North and South Forks of Shell Creek were very effective. It was determined that a current set of credible data were needed to accurately assess use support and evaluate the effectiveness of the implementations. Both forks of Shell Creek are Class 3B, however non-game fish were readily observed in both suggesting Class 2C classifications are more appropriate. The threat to the North and South Forks does not represent a human health risk. Because of these conditions, the priority ranking for TMDL development is “medium” at this time pending the interpretation of an updated set of credible data.

Based on reports of possible sewage in water and failed septic systems in Story, DEQ conducted a study of *E. coli*, a fecal coliform bacterium, in the waters in the Story area. Results of that study showed exceedences of the fecal coliform criterion in Dalton Ditch and North Piney Creek. Therefore, North Piney Creek from its confluence with South Piney Creek upstream to an undetermined location below SW, NW Sec 12, T53N, R84W, and Dalton Ditch have been added to Table A of the 303(d) List. While *E. coli* counts in the Piney-Cruse Ditch were above DEQ’s proposed criterion of 126 colonies per 100 mL, they were below Wyoming’s current fecal coliform criteria, so Piney-Cruse Ditch has not been listed. However, Piney-Cruse Ditch has the potential to be placed on the state’s 303(d) List when new criteria are adopted. DEQ is proposing to list the Dalton Ditch and North Piney Creek as a “high” priority for TMDL development. Several factors were considered in determining this priority. The high *E.coli* levels identified during the summer and fall of 2005 resulted in a determination by local health officials that there was a potentially significant human health concern from contact exposure to these waters, and the waters were posted with warnings. Another consideration was the long history of citizen complaints about septic system problems in the Story area, the shallow depth to groundwater and the fact that there are no other known potential significant sources such as sewage treatment plants or confined animal feeding operations. Additionally, there are the statutory requirements of Section 35-11-304 of the Environmental Quality Act. This section of the Statute mandates

certain standards, regulatory and enforcement requirements for programs which are delegated to local governments. The Administrator is required to periodically review such programs to determine their effectiveness. The DEQ believes that we would be abrogating our mandated responsibility if we did not give these waters a high priority. The high priority will assure that DEQ works with the local delegated authority to develop a timely and effective resolution.

A short reach of Hunter Creek was impacted from excessive sediment which washed off an adjacent road and was listed as threatened on the 1998 303(d) List. Road modifications and changes in maintenance have been implemented to reduce this impact, and data indicates that Hunter Creek is now fully supporting all its aquatic life uses.

Based on DEQ assessment data, Little Piney Creek fully supports its aquatic life uses.

DEQ data also shows that Boxelder Creek supports its aquatic life uses as a class 3B stream. Because many non-game fish were noted during the assessment, Boxelder Creek may not be properly classified. However, even if Boxelder Creek was classified as a 2C non-game fishery, it appears that it would be fully supporting that use in the lower reach.

Clear Creek was monitored by DEQ in 1999, and the data indicate full support of aquatic life uses, however WGFD records indicate that flow alterations may occasionally have a negative effect on cold water fish. French Creek is a class 2AB tributary to Clear Creek. Assessment by DEQ indicate impacts from flow augmentation, however it is meeting it aquatic life uses.

Middle Powder Sub-basin (HUC 10090207)
Middle Powder Sub-basin includes the lower portion of the Powder River in Wyoming before the Powder River flows into Montana. Historically, land uses have been primarily related to grazing with some oil and gas development. However, coal bed methane development is becoming a major land use in much of the sub-basin. Except for the Powder River main stem, reaches in this sub-basin are generally non-perennial. However, many of these stream beds have become perennial due to discharge of coal bed methane produced water. Examples include LX Bar, SA and Fence Creeks.

Monitoring was conducted on the Powder River by DEQ in 2000, but due to the very low to no flow conditions prior to sampling, more biological sampling will need to be completed to make a use support decision. The DEQ ambient data will need to be combined with the other available data (both from DEQ and other entities) to formulate an assessment of the Powder River. Water quality and biological (macroinvertebrates, fish, algae) data collected as part of a long term, interstate, interagency monitoring effort began in 2005, however funding to continue the program has not been secured.

Campbell County CD conducted monitoring in this sub-basin under a 319 agreement. Their monitoring indicated exceedences of the fecal coliform criterion in the lower reach of the Middle Prong of Wild Horse Creek. The Middle Prong of Wild Horse Creek, upstream an undetermined distance from its confluence with Wild Horse Creek, has been added to Table A of the 303(d) List.

Data collected by Campbell CCD on the Powder River show exceedences of the total recoverable aluminum criterion for protection of aquatic life. However, DEQ chose not to list at this time because the high numbers may be due to dissolution of clays in turbid samples, so it does not appear that the aluminum is biologically available to fish or other aquatic life.

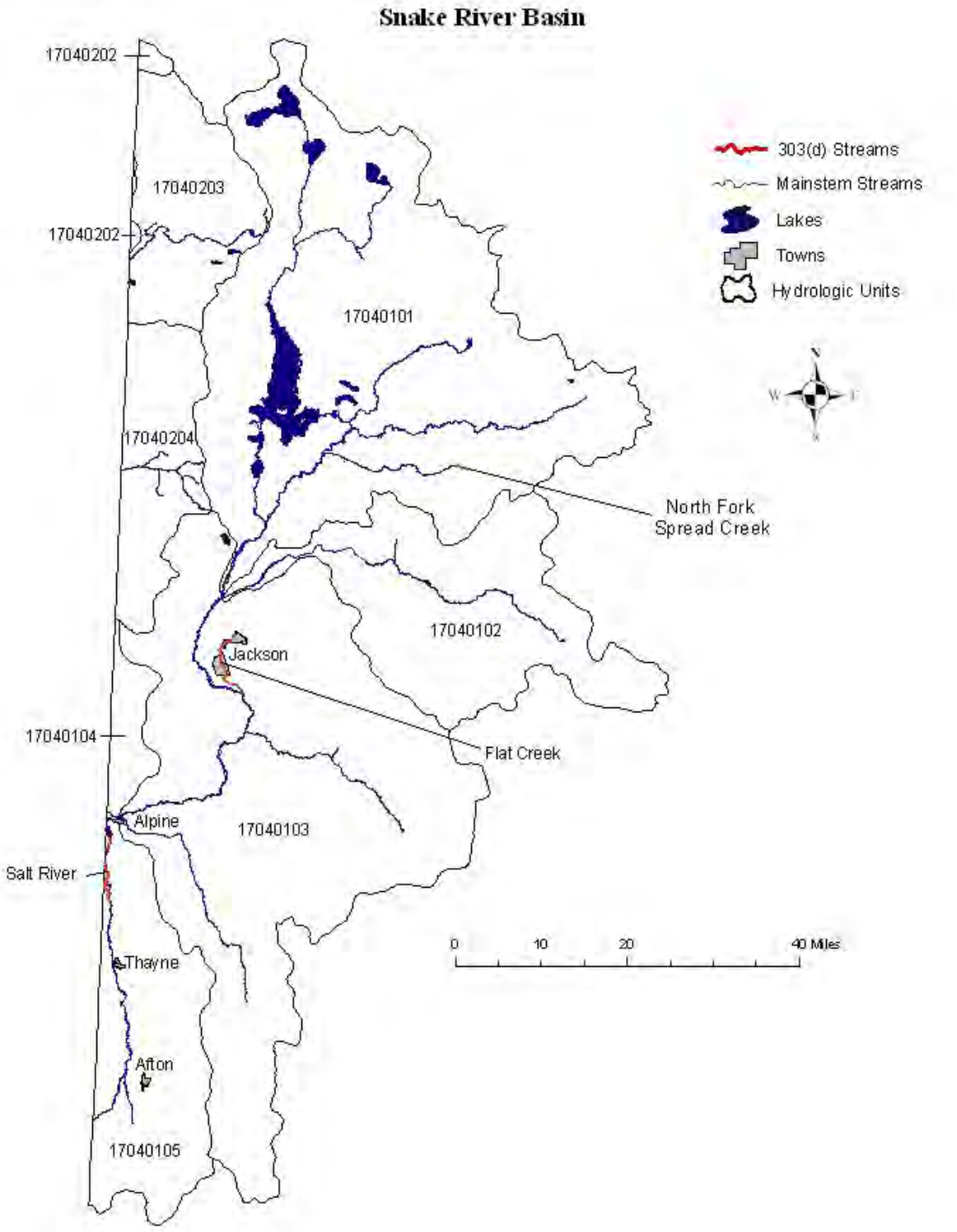
Little Powder Sub-basin (HUC 10090208)
The Little Powder River originates near Gillette and flows north into Montana, east of the Powder River in Wyoming. Primary land uses in the Little Powder Sub-basin include coal mining, coal bed methane development, and grazing. Moyer Spring is fed by water accumulated in scoria beds.

USGS data collected from the Little Powder River, near the Montana line, shows occasional exceedences of the fecal coliform criteria, and the Little Powder River was on Table C of the 303(d) List. The Campbell

County Conservation District monitored in the Little Powder River Drainage, working under a 319 grant. Their data indicate that the lower reach of the Little Powder River does not support its contact recreation uses from the Montana line upstream an undetermined distance above Olmstead Creek. This reach of the Little Powder River has been moved from Table C to Table A of the 303(d) List.

DEQ monitored the Little Powder River in 1999 and 2005, and the data are being evaluated to determine if aquatic life uses are supported. However, due to the dynamic nature of CBM development, it is difficult to make a use support decision due to the constantly changing conditions. By the time the data is analyzed, the data may no longer be representative.

Data collected by Campbell CCD on the Little Powder River show exceedences of the total recoverable aluminum criterion for protection of aquatic life. However, DEQ chose not to list at this time because the high numbers may be due to dissolution of clays in turbid samples, so it does not appear that the aluminum is biologically available to fish or other aquatic life.


Snake River Basin
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North Fork
Spread Creek
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Jackson
17040104
Flat Creek
Alpine
17040103
Salt River
Thayne
Afton
17040105
303(d) Streams
Mainstem Streams
Lakes
Towns
Hydrologic Units
0
10
20
40 Miles

Snake River Basin

Headwaters of the Snake River are in the Western Wyoming Mountains. Several tributaries join at Palisades Reservoir which straddles the Idaho border. The Snake River crosses Idaho and joins with the Columbia River. In Wyoming the Snake River moves a lot of sediment during high flow because of the relatively young, erosive geology in much of the basin. The basin in Wyoming consists mostly of steep mountains with several intermundane valleys. Outdoor recreation is the primary land use and drives the economy in the basin.

Snake Headwaters Sub-basin (HUC 17040101)
Waters of the Snake Headwaters Sub-basin originate in southern Yellowstone National Park, Grand Teton National Park, and the Bridger-Teton Wilderness area. This sub-basin extends from just above the Gros Ventre River confluence upstream. Buffalo Fork, Pacific Creek, and the Lewis River are the major tributaries in this sub-basin. Land use is primarily recreation, with areas of residential development, grazing and irrigated hay production.

A watershed improvement project, sponsored by the Bridger-Teton National Forest, on the North Fork of Spread Creek has rehabilitated the stream channel and improved the stream's ability to support aquatic life. This stream was thought to be meeting its aquatic life uses, but was considered threatened until the riparian vegetation is better established, so it is listed on Table C of the 303(d) List. Monitoring was conducted in 2003, but the data has not been completely analyzed. The North Fork is a Class 2AB water, but the threat does not represent a human health risk. The priority for TMDL development is "medium" at this time, pending the results of the use support assessment.

Gros Ventre Sub-basin (HUC 17040102)
Waters of the Gros Ventre Sub-basin originate in the Bridger-Teton National Forest. Recreation, grazing, irrigated hay production, and logging are primary land uses.

Greys-Hoback Sub-basin (HUC 17040103)
Waters of the Greys-Hoback Sub-basin originate in the Bridger-Teton National Forest. Much of the southern part of this sub-basin is in the overthrust belt, which has naturally high rates of erosion due to a combination of poorly indurated, sedimentary geology, and geologically young mountains. Principal land uses are recreation, grazing, hay production, and considerable residential development.

Residential development and the rapidly growing population is a concern from a water quality standpoint. Water quality assessments conducted on Flat Creek by Teton Conservation District clearly indicate that its ability to meet its aquatic life use support is threatened, primarily by urban runoff. Flat Creek is on Table C of the 303(d) List, and a watershed improvement project is underway to reduce sediment loading to the stream from urban sources. This project includes education and monitoring efforts, and installation of stormwater filtration systems to filter stormwater from the rodeo grounds as well as five urban sites. The Town of Jackson also has a commercial stormwater code, has initiated full time summer street sweeping, and has modified the type of salts it uses for ice control on town streets. A watershed plan is in development (WACD, 2005), and a formal commitment to such a planning effort has been received by DEQ. Flat Creek is a Class 2AB water, but the threat does not represent a human health risk. Because of these circumstances, the priority for TMDL development is "low" at this time.

Geologic investigations along the Hoback River indicate heavy sediment loadings as a result of mass wasting, mudflows, slumping, snow and rock avalanches and landslides, but it is unknown how much this natural process has been accelerated by human activity (Ryan et al, 2003).

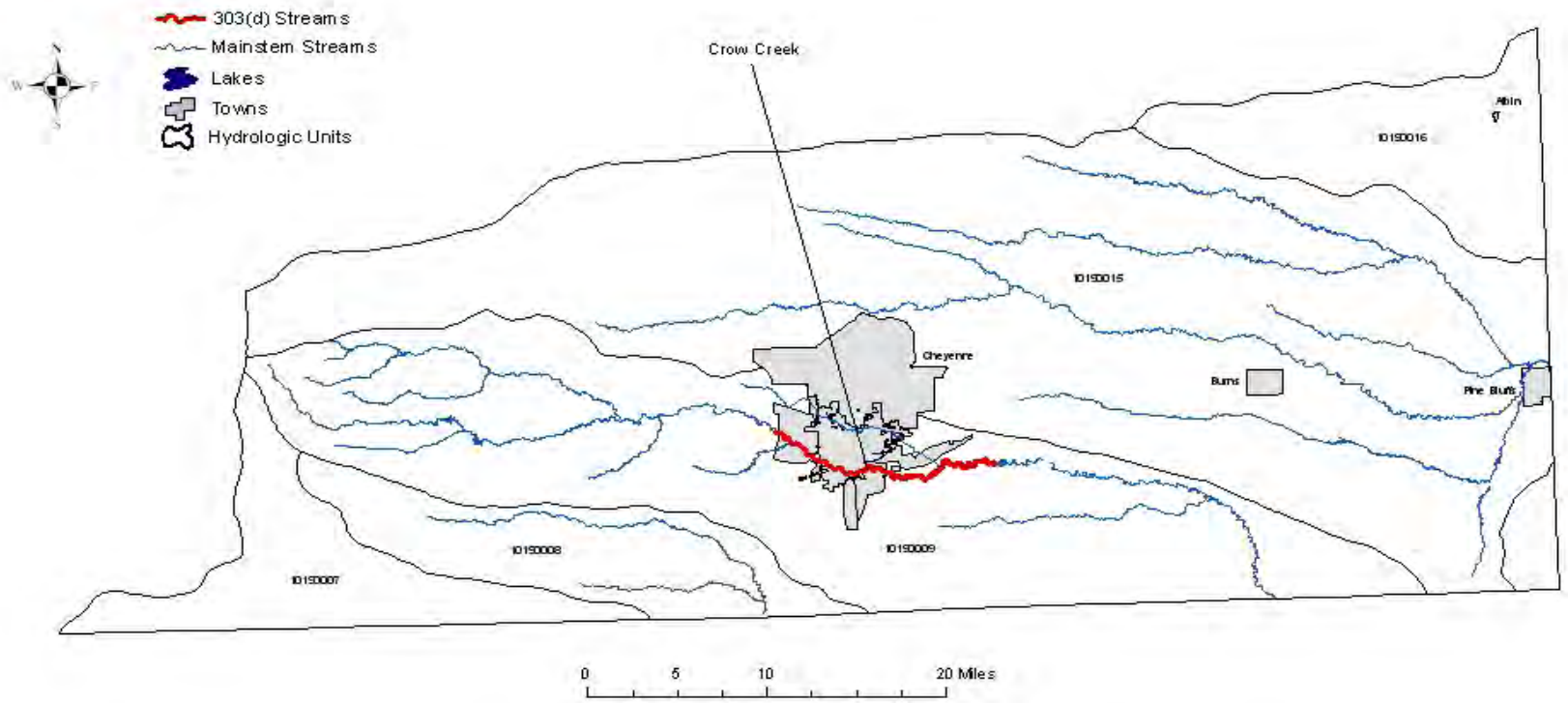
Palisades Sub-basin (HUC 17040104)
Waters of Palisades Sub-basin originate on the west side of the Teton Range in the Targhee National Forest. Land uses are primarily recreation and residential development.

Salt River Sub-basin (HUC 17040105)
The Salt River Sub-basin lies in an area of Wyoming known as Star Valley. Historically, land uses in the Valley have been predominantly associated with agriculture - irrigated small grain and hay production, dairy farming and beef production. However, today much of Star Valley is undergoing residential development. Recreation, grazing, and logging are primary land uses in the mountains surrounding the valley.

Studies have indicated that nutrient enrichment may be causing problems in some of the streams, but it has not been determined if the sources are due to agricultural activities, residential development, or both. The Star Valley Conservation District (SVCD) recently utilized a 319 project to provide public education and implement best management practices for agricultural nutrient management to reduce nutrient and fecal bacteria loading to streams in the watershed.

The lower Salt River is listed on Table C of the 303(d) List as threatened, because USGS fecal coliform data indicates that contact recreation uses are threatened. Water quality data collected by SVCD in the watershed indicate fecal coliform bacteria may be a problem in much of the Salt River and in Stump Creek. However, the data collected by SVCD did not meet QA/QC requirements for a use support decision, but is helpful for watershed planning (DEQ, 2004). SVCD has an approved watershed plan and is initiating planning efforts in Star Valley.

South Platte River Basin



South Platte River Basin

The South Platte River Basin in Wyoming is only about 2000 square miles, or 2% of the state's total land area. Most sub-basins (except the Lower Lodgepole Sub-basin) in the basin have their headwaters in the granitic Sherman Mountains of the Laramie range. These sub-basins generally drain toward the east and south into Nebraska and Colorado. Stream flows are generally perennial in the mountains and become intermittent on the plains. Native, non-game fish are adapted to these intermittent flows, and can even benefit from them because the flow regime limits colonization by many non-native fish species. Because of the sandy soils and low stream flows in much of the basin, most irrigation uses groundwater via sprinklers.

Cache La Poudre Sub-basin (HUC 10190007)
A small portion of the Cache La Poudre Sub-basin is in Wyoming in the Laramie Mountains, before it drains south into Colorado. Land use is primarily grazing, with limited hay production.

Lone Tree Sub-basin (HUC 10190008)
Headwaters of the Lone Tree Sub-basin are in the Laramie Mountains, and the sub-basin drains to the east. Grazing is the primary land use, with limited irrigated and non-irrigated agriculture in the lower elevations.

Crow Creek Sub-basin (HUC 10190009)
The Crow Creek Sub-basin originates in the Vedauwoo area between Laramie and Cheyenne. Its flows are supplemented by water from the Cheyenne Stage II Project which pipes water from the Douglas Creek drainage in the Upper North Platte Sub-basin to Crow Creek for a portion of Cheyenne's municipal water supply. Crystal, Granite, and Middle Crow reservoirs all lie in this sub-basin. Primary land uses are grazing, residential development, irrigated hay production, and both irrigated and dryland cropping in the lower sub-basin.

The city of Cheyenne appears to have a major impact on the water quality of Crow Creek (King, 1995; BRW/Noblitt & Wright-McLaughlin, 1978). Fecal coliform contamination is a constant problem in Crow Creek, from Dry Creek upstream through Warren Air Force Base, and exceedences of the criteria for ammonia have also been recorded. Crow Creek is listed on Table A of the 303(d) List for these two pollutants. Although Wyoming does not have numeric criteria for nitrates and phosphates for protection of aquatic life, high levels of these nutrients are another concern, since DEQ data show they increase more than ten-fold as Crow Creek flows through Cheyenne, to levels well above any EPA proposed criteria. Currently, Laramie CCD is conducting monitoring, working to provide education about water quality, and with the City of Cheyenne, is beginning implementation of management practices to reduce pollutant loading in Crow Creek. These practices include construction of wetlands to trap pollutants, buffer strips and riparian fencing, irrigation system improvements, animal feeding operation projects, small acreage grazing projects, and drain stenciling. The district has also initiated a watershed planning effort and a watershed plan has been completed. Additionally, the greater Cheyenne metropolitan area will be developing plans to address stormwater over the next three to ten years, and both of Cheyenne's waste water treatment plants will be using tertiary treatment by 2007 to nearly eliminate the ammonia loading to Crow Creek.

Fecal coliform and *E. coli* samples collected in the North Branch of North Fork Crow Creek and Middle Crow Creek exceed the fecal coliform criterion, which indicates these streams are not meeting their contact recreation uses. Several years of data indicate that the high fecal bacteria counts are primarily related to grazing practices, although recreational users and wildlife may also play a role. The Crow Creek Watershed Steering Committee has begun to address this issue and the Forest Service, in cooperation with stakeholders, has developed a final Water Quality Action Plan which combines BMP implementation, monitoring, and management of potential sources. The Forest Service has also released the Pole Mountain Improvements Project Scoping Statement to improve wildlife habitat, water quality, and livestock utilization in riparian areas on Pole Mountain. Because the Action Plan quantitatively monitors and requires movement of livestock before anticipated exceedences of grazing standards, DEQ believes that the problems will be addressed and a TMDL is not necessary. Therefore North Branch of North Fork Crow Creek and Middle Crow Creek have been removed from Table A of the 303(d) List and placed in Category 4B.

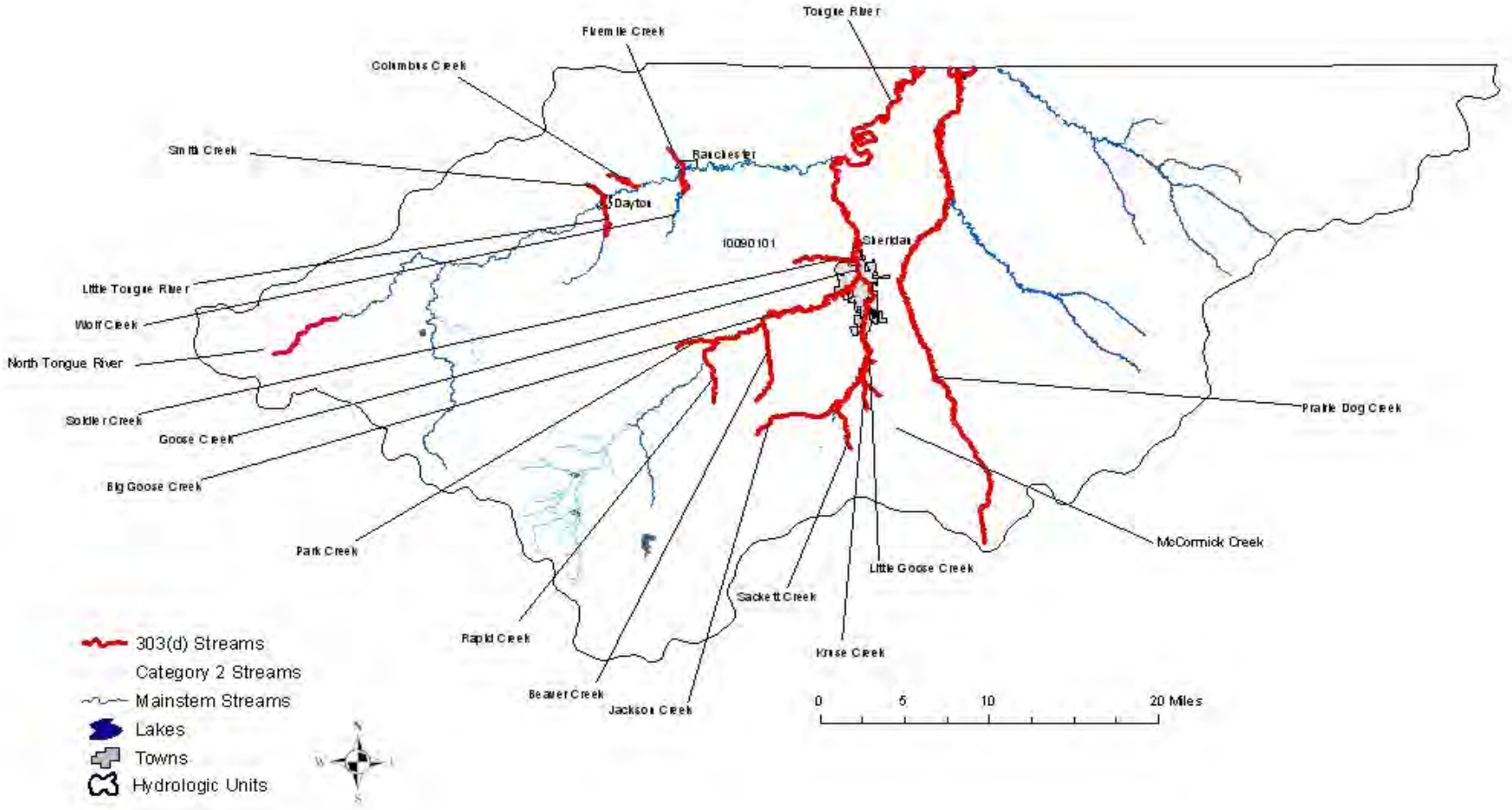
Sloans Lake in Cheyenne is frequented by a large number of ducks and geese, and also receives runoff from parks and streets. As a consequence, fecal coliform levels occasionally exceed the level of concern for primary contact recreation for a short period nearly every year. During the summer, Laramie County Environmental Health Officials routinely monitor those levels and close the lake to swimming when fecal coliform levels exceed the criteria for primary contact recreation. Although there are these occasional high counts, the state water criteria, which is based on a geometric mean, is not exceeded.

Although Dry Creek has intermittent flows near its confluence with Crow Creek, because of various water sources within Cheyenne, it is now a perennial stream within the city limits and supports a population of non-game fish, based on observations by DEQ biologists.

Upper Lodgepole Sub-basin (HUC 10190015)
The Upper Lodgepole Sub-basin originates in the Laramie Range, north of the Crow Creek Sub-basin and flows east through Pine Bluffs. Much of the stream is intermittent in the lower elevations with only isolated pools of standing water during the summer. The primary land use is agriculture - grazing in the upper sub-basin and irrigated and dryland crop production in the lower sub-basin. However, there has been considerable residential growth in the sub-basin in recent years, but effects of this growth on water quality are unknown.

Lower Lodgepole Sub-basin (HUC 10190016)
A small portion of the Lower Lodgepole Sub-basin is in eastern Laramie County, and it drains east into Nebraska. The sub-basin is small, with no perennial streams, and land uses are primarily dryland and sprinkler irrigated crop production, and grazing.

Tongue River Basin



Tongue River Basin

The Tongue River Basin in Wyoming consists of a single sub-basin (HUC 10090101), originating in the Big Horn Mountains west of Sheridan. Land uses in the National Forest are recreation, grazing and logging. In the lower sub-basin, primary land uses are irrigated agriculture, grazing and coal mining; with increasing residential development and coal bed methane activity.

Tongue Sub-basin (HUC 10090101)
Big Goose and Little Goose Creeks were placed on the 1998 303(d) List due to exceedences of the criteria for fecal coliform bacteria. Subsequent monitoring by DEQ in 1998 and 1999 revealed exceedences in several other locations in these watersheds (Kruse Creek, Sacket Creek, and Jackson Creek irrigation canal - tributaries of Little Goose Creek; Beaver Creek, Park Creek, and Rapid Creek - tributaries of Big Goose Creek), as well as in Goose Creek and a tributary, Soldier Creek. All these streams are on Table A of the 303(d) List. SCCD, under the guidance of a local watershed steering committee, developed a watershed plan, which was approved by DEQ in 2005. Implementation projects have already begun, including septic system improvements, animal feeding operations, riparian buffer development, streambank stabilization, reservoir development and changes in grazing management.

SCCD conducted fecal coliform monitoring in the Goose Creek Watershed in 2001 and 2002, which generally confirm the findings from the 1998-1999 DEQ study (SCCD, 2003). Their findings also extend the reach of Goose Creek that is not meeting its contact recreation uses from the confluence of Big and Little Goose Creeks downstream to the Highway 339 bridge crossing, and indicate that McCormick Creek is not meeting its contact recreation uses from the confluence of Little Goose Creek upstream an undetermined distance. McCormick Creek has been added to Table A of the 303(d) List and the impaired reach description of Goose Creek has been modified.

Sheridan CCD data collected in 2001 and 2002 showed exceedences of the temperature criteria for cold water fisheries in lower parts of the Goose Creek drainage, and less than optimal biotic condition close to Sheridan. Because the data was collected during near record low flows, which can mimic pollution effects on both water temperature and biotic condition, definitive aquatic life and fisheries use decisions could not be made based solely on this data. DEQ has since sampled stormwater, conducted further biological assessment of the streams in Sheridan, and completed a study of stormwater runoff. Results of these data indicate that stormwater discharges are contributing excessive fine sediment that is causing physical degradation of Little Goose and Goose Creeks within Sheridan, and is keeping these reaches from supporting their aquatic life and fisheries uses. Both of these reaches have been added to Table A of the 303(d) list.

Beaver Creek is classified as 3B, however SCCD reports it to have perennial flow, even during drought conditions, and suggests that it be reclassified to class 2AB (SCCD, 2000; SCCD, 2002).

DEQ has conducted assessments and completed an assessment report on the Tongue River which concludes that the lower Tongue River is impaired as a cold water fishery due to high temperatures. Additionally, the USGS recently began continuous monitoring of temperature which shows that the temperature criteria was exceeded every day for a 30 day period in 2001, and it was only met during portions of 4 of those 30 days. Elevated temperature readings were again observed at this USGS station during the 2002, 2003, and 2004 water years where 4 of 12 monthly samples, 2 of 12 monthly samples, and 3 of 20 bi-monthly samples, respectively, had water temperature readings at or greater than 20^{o} C. It has not been determined whether high temperature is a natural occurrence, but the reports cite loss of riparian cover and irrigation diversion as possible contributing factors. Because of the chronic high temperatures, the Tongue River, below Goose Creek, is on Table A of the 303(d) list. DEQ conducted continuous temperature monitoring in the Tongue River at several sites in 2003. Analysis of these data is currently in progress.

Assessments conducted by SCCD (SCCD, 2000) indicate that the lower reach of the Little Tongue River from its mouth up to an undetermined distance above the town of Dayton is not meeting its contact recreation use due to exceedences of the criteria for fecal coliform bacteria. This reach has been listed on

Table A of the 303(d) List. Additionally, SCCD analysis of "credible data" identified concerns about effects of habitat degradation on the biological community in and near Dayton. DEQ has monitored the Little Tongue River and will combine the data with the SCCD data to determine whether it supports its aquatic life uses. Other fecal coliform data collected in Dayton by SCCD indicate that Smith Creek also does not meet is contact recreation use, therefore it has been listed on Table A of the 303(d) List.

SCCD also conducted assessments on Columbus Creek which indicate that its contact recreation use is impaired (SCCD, 2000), and the stream has been listed on Table A of the 303(d) List due to high fecal coliform counts near the Highway 14 crossing. Occasional high fecal coliform counts (over 400 cfu/100 mL) on Wolf Creek indicate that its contact recreation use is threatened and it has been listed on Table C of the 303(d) List.

In Ranchester, a monitoring site on Five Mile Creek has recorded fecal coliform counts whose geometric mean exceeds the criterion, indicating it does not meet its recreational contact use (SCCD, 2000). Five Mile Creek is listed Table A of the 303(d) List).

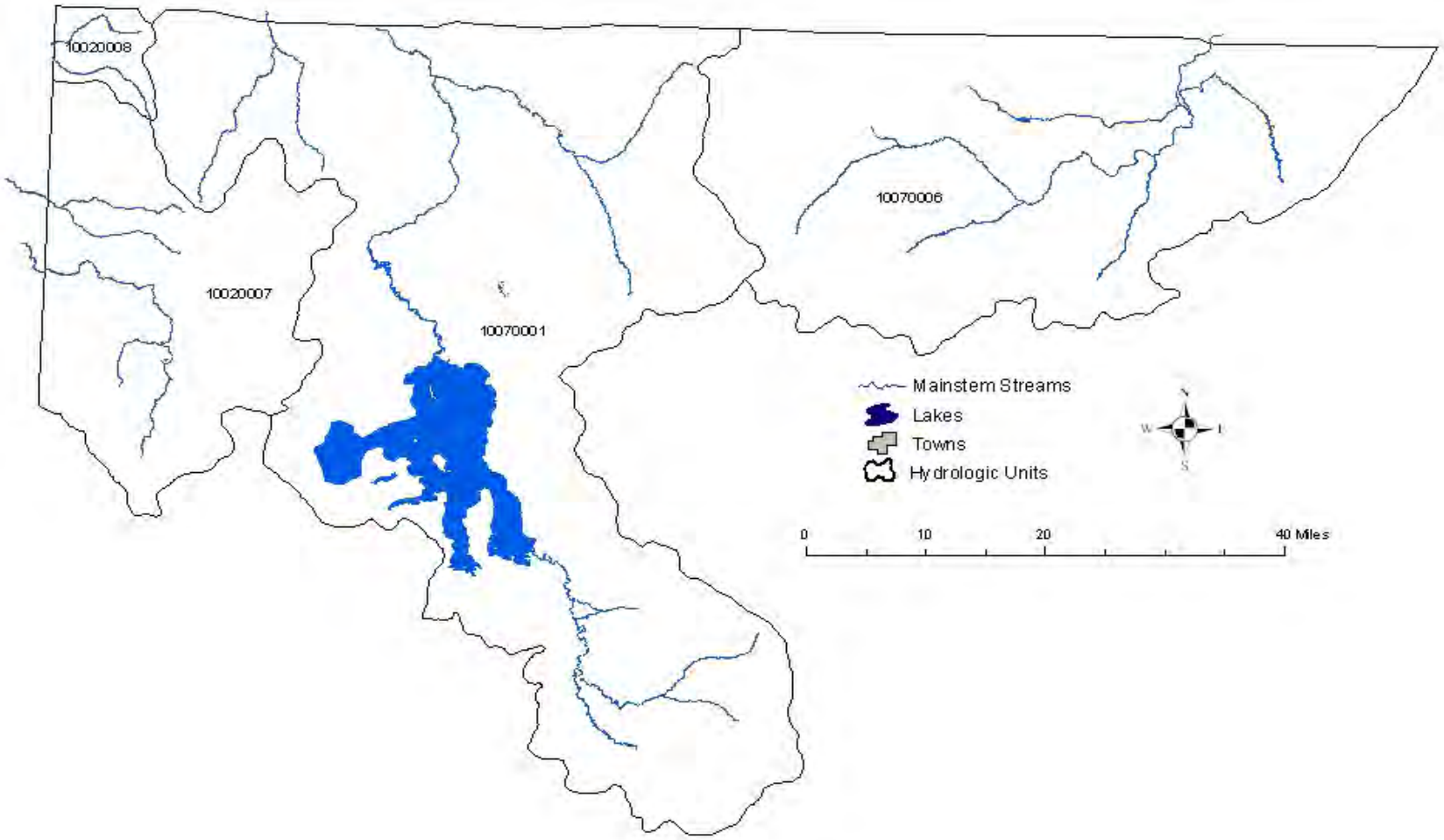
SCCD developed and finalized a watershed plan for the Tongue River watershed from the town of Ranchester upstream to the Bighorn National Forest boundary. The District has received a 319 grant to address these issues. Implementation measures include animal feeding operation projects, riparian buffer development, streambank stabilization, reservoir development, and grazing management changes.

Prairie Dog Creek, a tributary to the Tongue River, receives water from a trans-basin diversion, and that added flow is thought to have contributed to habitat degradation in portions of the stream channel (EnTech, Inc., 2001). A joint riparian improvement project between the WGFD and a landowner has rehabilitated part of the stream channel with a marked improvement in the habitat in the stream and riparian area. DEQ has conducted considerable monitoring in the Prairie Creek watershed. Data collected indicates that the majority of the stream reaches do support their aquatic life uses, although isolated areas of poor habitat do exist, and there are some concerns about high water temperatures in the lower watershed. High *E. coli* counts in Prairie Dog Creek exceed the criteria for fecal coliform bacteria, indicating that it does not support its contact recreation use, so Prairie Dog Creek is listed on Table A of the 303(d) List. SCCD is sponsoring a watershed planning effort on Prairie Dog Creek. Those watershed planning efforts have been recommended for funding through the Section 319 program. The district has submitted a Project Implementation Plan to accomplish this planning effort and, with this commitment, Prairie Dog Creek has been given a "low" priority for TMDL development for fecal bacteria. Prairie Dog Creek is also on the 303(d) List due to exceedences of the water quality criteria for manganese which indicates it is partially impaired for its aesthetic drinking water use. The manganese concentrations in Prairie Dog Creek are much below the human health criteria, but can cause discoloration of the water. It is likely that the high manganese concentrations are due to the natural geology of the area, which is similar to much of the Powder River geologic basin (Rice et al, 2002). A site specific criteria is being considered and the manganese impairment has a low priority for TMDL development.

E. coli (a fecal coliform bacterium) counts above the fecal coliform criteria in the North Tongue River indicate it is not supporting its contact recreation use. A diverse stakeholder group, sponsored by the Big Horn National Forest is working together in this watershed to manage this resource. The Forest Service is currently monitoring the watershed and that agency and the stakeholder group are using those data to recommend, implement, and assess stocking rate and herding changes on the allotments within the watershed. The formal stakeholder involvement coupled with federal land management and allotment planning is considered equivalent to watershed planning and the North Tongue River has been given a low priority for TMDL development.

Assessments conducted by DEQ on Prune Creek, Coney Creek, and the West Fork of Big Goose Creek indicate that these streams are supporting their aquatic life uses. BHNF and DEQ teamed up to remove improperly designed fish habitat structures within a grazing exclosure on Bull Creek that were causing channel widening and excessive sediment deposition.

Yellowstone River Basin



Yellowstone River Basin

The headwaters of the Yellowstone River originate in the Teton Wilderness Area south of Yellowstone National Park (YNP). The river flows north into YNP and then into a large caldera, where it forms Yellowstone Lake. After leaving the lake, the river flows north through the park and enters Montana and confluences with the Missouri River.

Yellowstone Headwaters Sub-basin (HUC 10070001)
In Wyoming, this sub-basin lies entirely within the Teton Wilderness Area or Yellowstone National Park; subsequently all its waters are designated Class 1. More than half of YNP lies in this sub-basin. Recreation is the primary land use in the sub-basin, and millions of people visit YNP each year, however, most of the sub-basin is wilderness and sees very few people.

Concerns about contamination by pathogens have been expressed after several recent sewage spills in YNP. However, major overhaul of some sewage infrastructures has begun, which should greatly reduce the risk of future spills.

Large portions of this sub-basin were involved in the 1988 Yellowstone fires, however, any water quality impacts from the fires are considered natural, so would not be considered an impairment for the purposes of this report or the 303(d) List. Likewise, water quality criteria exceedences associated with the many geothermal features in this sub-basin are not considered an impairment.

Many areas within YNP have been heavily grazed by elk and/or bison and many concerns of water quality impacts have been reported (Houston, 1982; Singer, 1996; YNP 1997). For example, historical photos of the lower Lamar River Valley show thick stands of willows which are very important for stabilizing this type of stream. However, most of the willows have been eradicated by long duration grazing and browsing by wildlife, and, as a consequence, considerable bank erosion has occurred along the river. With the reintroduction of wolves to YNP, riparian areas are making a dramatic recovery (Ripple and Beschta, 2003).

Soda Butte Creek, a tributary to the Lamar River, originates in Montana in an area of historical mining disturbance, including the McLaren mill tailings and defunct Republic Smelter. As a result of these impacts, Soda Butte Creek is on the Montana 303(d) list, but impacts in Wyoming have not yet been determined.

Clarks Fork Yellowstone Sub-basin (HUC 10070006)
The Clarks Fork headwaters are in Montana, and it flows southeast into Wyoming. Near the confluence with Sunlight Creek, it swings to the northeast, then flows back into Montana where it confluences with the Yellowstone River. The section of the Clarks Fork in Shoshone National Forest is Wyoming's only designated Wild and Scenic River. The upper two-thirds of the sub-basin in Wyoming is primarily Shoshone National Forest land, with small private in-holdings. Land uses in the upper sub-basin are primarily recreation, with some logging, grazing, irrigated hay production, and historic mining. Portions of the upper sub-basin were involved in the 1988 Yellowstone fires and subsequently salvage logged. Land uses in the lower sub-basin are primarily grazing, irrigated agriculture, and areas of oil and gas production.

The Clarks Fork of the Yellowstone was on Table A of the 303(d) List due to exceedences of the criteria for copper, silver, and cadmium, indicating partial impairment of its aquatic life uses. The source of these metals has been determined to be primarily from past mining activities in the New World Mine area in Montana. Remediation is currently taking place and TMDLs have been written, which are expected to fully address the metal impairments in Wyoming. Therefore, the impaired reach of the Clarks Fork in Wyoming has been removed from Table A and placed in Category 4A. Information on Montana's Clarks Fork TMDLs can be found at http://www.epa.gov/waters/tmdldocs/10746_FinalCCTMDL.pdf .

A 319 watershed improvement project on Squaw Creek moved a stretch of the road out of the riparian area to reduce sediment loading and degradation of the stream. The final report from this project shows that the water quality threat has been removed and that the stream is supporting its aquatic life and cold water fishery

uses (Page & Zubik, 2001).

A Shoshone National Forest stream bank stabilization project completed in 1997 on Pilot Creek successfully stabilized about 150 feet of stream bank and has reduced sediment transport from this drainage into the Clarks Fork.

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Designated Use Support Summary Tables

Miles are based on the National Hydrography Dataset (NHD). According to the NHD, Wyoming has 116,398 miles of perennial, intermittent, and ephemeral rivers and streams. Numbers are rounded to the nearest mile.

Table 1a. Individual Use Support Summary for Assessed Wyoming Streams and Rivers

Designated Use	Miles Assessed	Miles Fully Supporting	Miles Fully Supporting and Threatened	Miles Not Supporting
Aquatic Life	7582	6296	233	681
Fisheries	6778	5968	154	656
Contact Recreation	742	0	154	588

Table 1b. Individual Use Support Summary for Assessed Wyoming Lakes

Designated Use	Acres Assessed	Acres Fully Supporting	Acres Fully Supporting and Threatened	Acres Not Supporting
Aquatic Life	6238	0	0	6238
Fisheries	6076	0	0	6091

Table 2. Summary of Fully Supporting, Threatened, and Impaired Waters in Wyoming

Degree of Designated Use Support	River Miles Assessed	Percentage of River Miles Assessed	Lake Acres Assessed	Percentage of Lake Acres Assessed
Fully Supporting All Assessed Uses	6240	82.3	0	0
Fully Supporting All Assessed Uses but Threatened for At Least One Use	387	5.1	0	0
Impaired for One or More Uses	955	12.6	6238	100.0
Total Assessed	7582	100.0	6238	100.0

Table 3. Summary of Causes Impairing Wyoming's Assessed Waters

Cause	River Miles	Lake Acres
Metals (Includes individual metals listed below)	193	
Cadmium	13	
Copper	17	
Manganese	16	
Selenium	330	146
Silver	13	
Ammonia	7	
pH	23	
Phosphorus		15
Siltation	48	6091
Chlorides	2465	
Temperature	55	
Physical/Habitat Degradation	266	
Pathogens (Fecal Coliform, *E. coli*)	652	
Oil	29	

Table 4. Summary of Sources Impairing Wyoming's Assessed Waters

Source	River Miles	Lake Acres
Municipal Point Sources	7	
Agriculture - Irrigated Crop Production	143	6222
Agriculture -Grazing in Riparian or Shoreline Zones	203	
Habitat Alterations - Loss of Riparian Habitat	16	
Urban Runoff/ Storm Sewers	37	15
Resource Extraction - Petroleum Activities	233	
Resource Extraction - Abandoned Mining	7	
Resource Extraction - Subsurface hardrock mining	11	
Natural Sources	286	
Sources Unknown	971	
Sources outside State Jurisdiction or Borders	12	

Categorization of all the Waters of Wyoming

EPA guidance asks that all waters of the state get placed into one of five categories of designated use attainment, based on all available data. Because of the data requirements to make a use support determination in Wyoming, only the 4575 miles of waters assessed (approximately 4% of the total waters in Wyoming) can be in a category other than #3. Following is the list of the categories these waters will be placed in.

1. All designated uses are met. *(Wyoming does not have any waters in this category because the intensive, long-term sampling data does not exist to determine if contact recreation and drinking water uses are always supported.)*

2. Some designated uses supported, but unknown on others. *(All of the waters assessed as fully supporting all designated aquatic life uses are in this category, because the intensive, long-term sampling data does not exist to determine if drinking water and contact recreation uses are always supported. It is assumed that agricultural, industrial, scenic value and wildlife uses are also supported, if the aquatic life uses are supported.)*

3. Insufficient data to determine if any designated uses are met. (*All waters in Wyoming that are not identified elsewhere are in this category. These waters will not be listed individually.)*

4. Water is impaired or threatened but TMDL is not needed.

   4A. TMDLs approved by EPA. *(Most former Table B waters - Waters with NPDES Discharge Permits Containing current WLAs/TMDLs, and other waters with TMDLs)*

   4B. Other required pollution control requirements are expected to address all water-pollutant combinations and attain WQS in reasonable period of time.

   4C. Pollution, not pollutants, are the sole source of impairment. *(Wyoming does not have any waters identified in this category.)*

5. TMDLs needed. The 303(d) List. *(Wyoming splits the 303(d) List into three tables, listed below.)*

   Table A: 303(d) Waters with Water Quality Impairments

   Table B: 303(d) Waters with NPDES Discharge Permits Containing WLAs/TMDLs Expiring

   Table C: 303(d) Waters with Water Quality Threats

Table 5: Category 2 Waters which Support their Designated Aquatic Life Uses

Basin	HUC	Water	Size (miles)
BF	10120201	Blacktail Creek above National Forest boundary	19
BF	10120201	Beaver Creek - Lame Deer Creek Watershed	35
BF	10120201	Beaver Creek	29
BF	10120201	Wood Canyon	3
BF	10120201	Reservoir Gulch	2
BF	10120201	Cub Creek	2
BF	10120201	Little Creek	2
BF	10120201	Fawn Creek	3
BH	10080001	Bear Creek	80
BH	10080001	East Fork Wind River above Wiggins Fork	196
BH	10080003	Baldwin Creek	44
BH	10080003	Squaw Creek	22
BH	10080007	Upper Grass Creek	66
BH	10080010	Mail Creek	2
BH	10080010	Crooked Creek Upper	5
BH	10080010	Porcupine Creek	77
BH	10080012	North Fork Shoshone River above National Forest boundary	754
BH	10080016	Little Bighorn River	55
BH	10080016	West Pass Creek	20
BR	16010101	Pleasant Valley Creek above Crompton Reservoir	36
BR	16010101	Bear River Upper	51
BR	16010101	Mill Creek	21
BR	16010102	Smiths Fork Upper	137
BR	16010102	Coantag Creek	35
BR	16010102	Hobble Creek	67
BR	16010102	Salt Creek	60
BR	16010102	Giraffe Creek	19
GR	14040101	Upper Green Drainage below Green River Lakes	348
GR	14040101	Upper LaBarge Creek Drainage	94
GR	14040101	Rock Creek	8
GR	14040101	Lower Fontenelle Creek	13
GR	14040101	Upper Fontenelle Creek Drainage	128
GR	14040102	New Fork River below New Fork Lakes	255
GR	14040102	Pole Creek	25
GR	14040104	Big Sandy River below Little Sandy	31
GR	14040107	West Fork Smiths Fork	9
GR	14040107	Hams Fork above Kemmerer	456
GR	14040107	East Fork Smiths Fork	27
LS	14050003	N Fk/ Roaring Fk Little Snake	31
LS	14050003	Lost Creek	5
LS	14050003	Little Savery Creek - Grizzly	4
LS	14050003	Upper Savery drainage	83
LS	14050003	Loco Creek	12
LS	14050004	Muddy Creek above Littlefield Creek	21
LS	14050004	Littlefield Creek	10
LS	14050004	McKinney Creek above Eagle Creek	23
NP	10180002	North Platte River above Sage Creek	108

Basin	HUC	Water	Size (miles)
NP	10180002	Lower Douglas Creek	39
NP	10180002	Muddy Creek	9
NP	10180002	Smith North Creek	5
NP	10180002	Big Creek Upper	28
NP	10180002	French Creek	57
NP	10180002	Encampment River Lower	11
NP	10180002	Upper Encampment	118
NP	10180002	Hog Park Creek, South Fork	2
NP	10180002	Upper Spring Creek	69
NP	10180002	Jack Creek Drainage	147
NP	10180004	Upper Rock Creek Drainage	127
NP	10180004	Upper Medicine Bow River Drainage	64
NP	10180006	Willow Creek	36
NP	10180008	Horseshoe Creek Lower	15
NP	10180010	Upper Big Laramie	81
NP	10180010	Little Laramie River Upper Drainage	153
NP	10180010	Little Laramie River South Fork Upper	6
NP	10180010	Mill Creek Middle Fork Upper	3
NP	10180011	Upper Chugwater Mainstem	101
NP	10180012	Upper Horse Creek	46
NP	10180012	Bear Creek Drainage	314
PR	10090201	Middle Fork Powder above Buffalo Creek	70
PR	10090201	Blue Creek	18
PR	10090201	Beaver Creek above Blue Creek	58
PR	10090201	Upper Beartrap/Sawmill Creek	13
PR	10090201	Webb Creek	5
PR	10090202	Ninemile Creek	162
PR	10090202	Fourmile Creek	43
PR	10090205	Little North Fork Crazy Woman Creek	19
PR	10090205	Pole Creek	8
PR	10090205	Billy Creek	13
PR	10090205	Poison Creek	23
PR	10090205	Middle Fork Crazy Woman Creek	53
PR	10090205	Crazy Woman Creek	25
PR	10090205	Beaver Creek; Pole Creek	47
PR	10090205	Doyle Creek Upper	9
PR	10090206	Clear Creek	196
PR	10090206	Hunter Creek	2
PR	10090206	French Creek	22
PR	10090206	Rock Creek Lower	23
PR	10090206	South Piney Creek	23
PR	10090206	Piney Creek	205
PR	10090206	Boxelder Creek	42
PR	10090206	Little Piney Creek	14
TR	10090101	Coney Creek	14
TR	10090101	Prune Creek	5
TR	10090101	West Fork Big Goose Creek	29
YR	10070006	Squaw Creek	2

Table 6: Category 4A Waters with TMDLs to Address Water Quality Threats or Impairments

Basin	HUC	Water	Class	TMDLs	Facility Name	Permit #	Permit Expiration Date	Date TMDL Approved or Submitted
BF	10120201	Donkey Creek	3B	Copper, Iron	Pacificorp	WY0001384	9/30/2010	6/28/1999
BF	10120201	Donkey Creek	3B	Radium	Yates Petroleum	WY0038113	1/31/2007	1/21/1999
BH	10080001	Wind River	2AB	Ammonia, Chlorine, Fecal Coliform	Dubois WWTF	WY0020834	4/30/2009	6/8/2004
BH	10080001	Wind River	2AB	Ammonia, Fecal Coliform, Chlorine	Riverton WWTF	WY0020672	5/31/2008	9/27/2004
BH	10080002	Beaver Creek	2AB	Radium, Chlorides	Devon Energy Production OT	WY0000256	12/31/2008	5/25/2004
BH	10080003	Popo Agie River	2AB	Ammonia, Fecal Coliform, Chlorine	Hudson WWTF	WY0020664	2/28/2008	5/25/2005
BH	10080003	Popo Agie River	2AB	Ammonia, Chlorine, Fecal Coliform	Lander WWTF	WY0020389	6/30/2010	7/7/2005
BH	10080005	Ocean Lake Drain #6	3B	Ammonia, Fecal Coliform, Chlorine	Pavillion WWTF	WY0020222	9/30/2008	10/19/1998
BH	10080007	Bighorn River	2AB	Ammonia, Fecal Coliform, Chlorine	Thermopolis WWTF	WY0020192	1/31/2009	6/8/2004
BH	10080007	Grass Creek	2AB	Radium, Chlorides	Meeteetse 15 Battery	WY0032042	12/31/2008	6/8/2004
BH	10080007	Grass Creek	2AB	Radium, Chlorides	Ridgely #1 Battery	WY0035131	12/31/2008	6/8/2004
BH	10080008	East Tensleep Creek	2AB	Ammonia, Chlorine, Fecal Coliform	Lake Lodge Resort WWTF	WY0042218	10/31/2009	11/18/2004
BH	10080008	Nowood River	2AB	Ammonia, Fecal Coliform, Chlorine	Manderson WWTF	WY0052442	Permit not issued yet	4/27/2005
BH	10080008	Tensleep Creek	2AB	Ammonia, Chlorine, Fecal Coliform	Tensleep WWTF	WY0020168	5/31/2010	7/31/2005
BH	10080008	West Tensleep Creek	2AB	Ammonia	Deer Haven Lodge	WY0023400	5/31/2010	7/13/2005
BH	10080014	Sage Creek	2AB	Ammonia, Chlorine, Fecal Coliform	Frannie WWTF	WY0020052	5/31/2010	7/13/2005
BH	10080014	Shoshone River	2AB	Ammonia, Chlorine, Fecal Coliform	Lovell WWTF	WY0020061	6/30/2010	7/2/2005
BH	10080014	Shoshone River	2AB	Ammonia, Fecal Coliform, Chlorine	Byron WWTF	WY0020281	3/31/2009	1/23/2003
BR	16010101	Yellow Creek	2C	Ammonia, Chlorine, Fecal Coliform	Evanston WWTF	WY0020095	8/31/2009	(submitted 11/2/2005)

Basin	HUC	Water	Class	TMDLs	Facility Name	Permit #	Permit Expiration Date	Date TMDL Approved or Submitted
BR	16010102	Bear River	2AB	Ammonia, Fecal Coliform, Chlorine	Cokeville WWTF	WY0021032	7/31/2009	7/13/2005
GR	14040101	Muddy Creek	2AB	Ammonia, Fecal Coliform, Chlorine	Marbleton WWTF	WY0021997	6/30/2008	9/27/2004
GR	14040101	North Piney Creek	2AB	Ammonia, Chlorine, Fecal Coliform	Big Piney WWTF	WY0020133	9/30/2010	Resubmitted 7/25/2005
GR	14040105	Bitter Creek	2C	Ammonia, Fecal Coliform, Chlorine	Rock Springs WWTF	WY0022357	5/31/2010	7/13/2005
GR	14040107	Blacks Fork Green River	2AB	Ammonia, Fecal Coliform, Chlorine	Granger WWTF	WY0022373	9/30/2007	1/23/2003
GR	14040107	Hams Fork Green River	2AB	Ammonia, Fecal Coliform, Chlorine	Kemmerer-Diamondville WWTF	WY0020320	6/30/2008	9/27/2004
GR	14040107	Smiths Fork Green River	2AB	Ammonia, Fecal Coliform, Chlorine	Mountain View WWTF	WY0022896	10/31/2008	6/8/2004
LS	14050003	Ledford Slough	2C	Ammonia, Chlorine, Fecal Coliform	Baggs WWTF	WY0022888	9/30/2010	12/12/1996
LS	14050003	Little Snake River	2AB	Ammonia, Chlorine, Fecal Coliform	Dixon WWTF	WY0021938	1/31/2010	12/12/1996
NP	10180004	Medicine Bow River	2AB	Ammonia, Fecal Coliform, Chlorine	Medicine Bow WWTF	WY0020257	10/31/2008	Submitted 11/21/2005
NP	10180006	Crooks Creek	2AB	Radium, Zinc	Green Mountain Venture	WY0025950	6/30/2008	9/27/2004
NP	10180007	North Platte River	2AB	Ammonia, Chlorine, Fecal Coliform	Glenrock WWTF	WY0020630	6/30/2010	7/7/2005
NP	10180007	North Platte River	2AB	Ammonia, Fecal Coliform, Chlorine	Casper WWTF	WY0021920	10/31/2008	6/8/2004
NP	10180007	North Platte River	2AB	Chlorine	Central WY Regional Water System WTP	WY0023612	2/28/2009	6/29/1999
NP	10180008	North Platte River	2AB	Ammonia, Fecal Coliform, Chlorine	Guernsey WWTF	WY0021831	1/31/2009	6/8/2004
NP	10180008	North Platte River	2AB	Ammonia, Fecal Coliform, Chlorine	Douglas WWTF	WY0020109	1/31/2009	6/8/2004
NP	10180009	North Platte River	2AB	Ammonia, Fecal Coliform, Chlorine	Fort Laramie WWTF	WY0020567	1/31/2010	Submitted 10/5/2005
NP	10180009	North Platte River	2AB	Ammonia, Fecal Coliform, Chlorine, Nitrates, Arsenic, Selenium	Torrington WWTF	WY0020231	10/30/2008	5/25/2004

Basin	HUC	Water	Class	TMDLs	Facility Name	Permit #	Permit Expiration Date	Date TMDL Approved or Submitted
NP	10180009	Rawhide Creek	2AB	Ammonia, Chlorine, Fecal Coliform	Lingle WWTF	WY0021849	3/31/2009	Submitted 11/21/2005
NP	10180010	Laramie River	2AB	Ammonia, Chlorine, Fecal Coliform	Laramie WWTF	WY0022209	7/31/2009	10/22/2004
NP	10180011	Chugwater Creek	2AB	Ammonia, Fecal Coliform, Chlorine	Chugwater WWTF	WY0021431	1/31/2008	5/25/2005
NP	10180011	Wheatland Creek	2C	Ammonia, Chlorine, Fecal Coliform	Wheatland WWTF	WY0020150	9/30/2006	6/8/2004
PR	10090201	Middle Fork Powder R.	2AB	Ammonia, Chlorine, Fecal Coliform	Kaycee WWTF	WY0021733	6/30/2010	7/7/2005
PR	10090202	Beaver Creek	2AB	Radium	Yates Petroleum	WY0038091	9/30/2008	1/21/1999
PR	10090206	Clear Creek	2AB	Ammonia, Chlorine, Fecal Coliform	Clearmont WWTF	WY0022063	9/30/2010	Resubmitted 7/25/2005
SP	10190009	Crow Creek	2C	Ammonia, Chlorine, Fecal Coliform	Cheyenne Crow Creek WWTF	WY0022381	5/31/2008	9/27/2004
SP	10190009	Crow Creek	2C	Ammonia, Chlorine, Fecal Coliform	Cheyenne Dry Creek WWTF	WY0022934	5/31/2008	9/27/2004
SP	10190009	Crow Creek	2C	Ammonia, Chromium, Hexavalent Chromium, Phenols, Temperature	Frontier Refinery	WY0000442	7/31/2008	6/8/2004
SP	10190015	Lodgepole Creek	2AB	Radium, Chlorides	Great Plains Environmental	WY0035785	8/31/2004	11/15/1999
SR	17040105	Snake River	2AB	Ammonia, Fecal Coliform, Chlorine	Alpine WWTF	WY0035611	4/30/2009	Unknown
TR	10090101	Goose Creek	2AB	Ammonia, Fecal Coliform, Chlorine	Sheridan WWTF	WY0020010	5/31/2008	9/27/2004
TR	10090101	Goose Creek	2AB	Ammonia, Fecal Coliform, Chlorine	Big Horn KOA WWTF	WY0026441	5/31/2008	9/27/2004
TR	10090101	Prairie Dog Creek	2AB	Radium, Chlorides	J.M. Huber Corp.	WY0038857	4/30/2009	6/29/1999
TR	10090101	Tongue River	2AB	Ammonia, Chlorine, Fecal Coliform	Ranchester WWTF	WY0022161	8/31/2010	Submitted 6/21/2005
TR	10090101	Tongue River	2AB	Ammonia, Fecal Coliform, Chlorine	Dayton WWTF	WY0020435	3/31/2008	5/25/2004
YR	10070006	Clarks Fork Yellowstone	1	Copper, Silver, Cadmium TMDLs in Montana	NA	NA	NA	

Table 7: Category 4B Waters with Other Controls to Address Water Quality Threats or Impairments

Basin	HUC	Water	Class	Impairments/Threats	Controls to Address WQ Impairments/Threats
PR	10090204	Salt Creek	2C	Oil Spill Threats	Oil Spills regulated by other Environmental Laws. Salt Creek still on 303(d) List due to exceedences of Chloride criterion.
SP	10190009	Middle Crow Creek	2AB	Fecal Coliform	Medicine Bow National Forest Water Quality Action Plan
SP	10190009	North Branch North Fork Crow Creek	2AB	Fecal Coliform	Medicine Bow National Forest Water Quality Action Plan

2006 303(d) List of Waters Requiring TMDLs

The 2006 303(d) List is incorporated into three tables (Tables A, B & C) Table A is a list of waters with water quality impairments requiring a TMDL. There are 10 additional waters on table A: seven new listings, and three waters moved from Table C because further monitoring indicated use impairment. Two of the moved segments are not meeting their contact recreation use, and the other does not meet its aquatic life uses. Of the new listings, four waters have aquatic life use impairments, and the other three have contact recreation use impairments. Twenty-seven new waters were added to Table B, which are waters with waste load allocation discharge permits expiring, due to review of the Waste Load Allocations/TMDLs for the discharge permits. One water was added to Table C for threats to support of contact recreation uses. Thirty-three waters are delisted from the 2004 303(d) List: one from Table A due to TMDLs; twenty-five waters are delisted from Table B of the 2004 303(d) list due to EPA approval (or expected approval) of Waste Load Allocations/TMDLs or other factors affecting permitted discharges; one because of an improper listing on Table C; three because of changes to permits, discharges or classifications of receiving waters, and; three because of other environmental laws or controls addressing the pollutants. The delisted waters can be found on Table D.

Wyoming's "Method for Determining Water Quality Condition for Surface Waters" (available on the DEQ-WQD website) outlines how waters on the 303(d) List are to be prioritized for TMDL development. Most waters on Tables A and C of the 303(d) List have been given low priorities for TMDL development because local watershed stakeholder groups have established, or have committed to establish, watershed management plans. These plans must identify the problems and develop an implementation strategy to ensure designated uses will be restored in a reasonable amount of time. All waters on Table B have a high priority for TMDL development since Waste Load Allocations/TMDLs must be developed within two years. On the following page is a schematic to help show how these waters were prioritized.

Schematic for Determining Priority for TMDL Development - 2006 303(d) List

1a. Impairment Will be Addressed in WYPDES Permit WLA;

- 2a. WLA to be Approved in Biennium . . . . . High Priority
- 2b. WLA to be Approved in Second Biennium . . . . . Medium Priority

1b. Impairment Will Not be Addressed in WYPDES Permit WLA;

- 3a. Formal Commitment to Watershed Planning . . . . . Low Priority
- 3b. No Formal Commitment to Watershed Planning;
  - 4a. Human Health Risk Associated with Pollutant;
    - 5a. UAA with Credible Data Submitted . . . . . Low Priority
    - 5b. No UAA or UAA Lacking Credible Data;
      - 6a. Other Ongoing Actions Currently Addressing the Impairment on a Watershed Scale . . . . . Medium Priority
      - 6b. No Watershed-Scale Implementations or Will not Address Impairment . . . . . High Priority
  - 4b. No Human Health Risk Associated with Pollutant;
    - 7a. High Quality Water (Classes 1 & 2);
      - 8a. UAA with Credible Data Submitted . . . . . Low Priority
      - 8b. No UAA or UAA Lacking Credible Data . . . . . Medium Priority
    - 7b. Lower Quality Water (Classes 3 & 4) . . . . . Low Priority

Table A: 2006 303(d) Waters with Water Quality Impairments

Basin	HUC	Name	Class	Location	Cause of Impairment	Sources	Data Sources	Uses Impaired	Date Listed	Priority
BF	10120201	BELLE FOURCHE RIVER	2ABWW	Exceedences measured between Arch Ck and Hulett.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	1996	L
BF	10120201	BELLE FOURCHE RIVER	2ABWW	From Keyhole Reservoir upstream an undetermined distance above Rush Ck.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	1996	L
BF	10120201	DONKEY CREEK	3B	**From confluence with Belle Fourche R upstream to an undetermined distance above Antelope Butte Ck.**	Fecal Coliform	Non-point, Point, Undeterm.	DEQ, Campbell CCD	Contact Recreation	2000	L
BF	10120201	GILLETTE FISHING LAKE	2AB	Gillette Fishing Lake.	Phosphate	Non-point	Intermountain CD	Warm Fish, Aquatic Life	1996	L
BF	10120201	GILLETTE FISHING LAKE	2AB	Gillette Fishing Lake.	Siltation	Non-point	Intermountain CD	Warm Fish, Aquatic Life	1996	L
BF	**10120201**	**STONEPILE CREEK**	**3B**	**From confluence with Donkey Creek upstream an undetermined distance**	**Fecal Coliform**	**Non-point, Undeterm.**	**DEQ**	**Contact Recreation**	**2002**	**L**
BR	16010101	BEAR RIVER	2AB	From Woodruff Narrows Reservoir up to Sulphur Creek.	Sediment	Undeterm.	DEQ	Aquatic Life	2002	L
BH	10080003	MIDDLE FORK POPO AGIE RIVER	2AB	Undetermined distances upstream and downstream of City of Lander.	Fecal Coliform	Point Undeterm.	DEQ	Contact Recreation	2002	L
BH	**10080005**	**OCEAN LAKE**	**2ABWW**	**Ocean Lake**	**Sediment**	**Non-point**	**DEQ, WGFD**	**Warm Fish, Aquatic Life**	**1996**	**L**
BH	10080007	BIG HORN RIVER	2AB	From Greybull R upstream to Nowood R.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
BH	10080007	COTTONWOOD CREEK	2AB	From Bighorn River up to Hamilton Dome Oil Field.	Chloride	Point	Merit Energy, DEQ	Cold Fish, Aquatic Life	2004	L
BH	10080007	COTTONWOOD CREEK	2AB	From Bighorn River up to Hamilton Dome Oil Field.	Selenium	Point	Merit Energy	Cold Fish, Aquatic Life, Wildlife	2004	L
BH	10080008	NOWOOD RIVER	2AB	From confluence with Bighorn R upstream an undetermined distance.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
BH	10080009	GREYBULL RIVER	2AB	From confluence with Bighorn R upstream to the Sheets Flat bridge.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
BH	10080010	BIG HORN RIVER	2AB	From Greybull R downstream undetermined distance above Big Horn Lake.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
BH	10080010	GRANITE CREEK	2AB	From confluence with Shell Ck upstream approximately 4 miles to an undetermined point near Antelope Butte Ski Area.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	**M**
BH	10080010	SHELL CREEK	2AB	From confluence with Bighorn R upstream an undetermined distance.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L

** **BOLDED** text indicates new listing or change to existing listing.

Basin	HUC	Name	Class	Location	Cause of Impairment	Sources	Data Sources	Uses Impaired	Date Listed	Priority
BH	10080014	BIG WASH	3B	From confluence with Sage Ck upstream to Sidon Canal.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
BH	10080014	BITTER CREEK	2AB	From Shoshone R up an undetermined distance above Powell.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
BH	10080014	POLECAT CREEK	2AB	From confluence with Sage Ck upstream an undetermined distance.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
BH	10080014	SAGE CREEK	2AB	From confluence with Shoshone R upstream an undetermined distance above Big Wash.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
BH	10080014	SHOSHONE RIVER	2AB	From confluence with Bighorn Lake upstream an undetermined distance.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
BH	10080014	WHISTLE CREEK	3B	From confluence with Shoshone R upstream an undetermined distance.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
GR	14040105	BITTER CREEK	2C	From Green R up to Killpecker Ck.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
GR	14040105	BITTER CREEK	2C	From Green R up to Killpecker Ck.	Chloride	Undeterm.	DEQ	Non-game Fish, Aquatic Life	2002	L
GR	14040105	KILLPECKER CREEK	3B	Near Rock Springs, tributary to Bitter Ck.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
GR	14040107	BLACKS FK GREEN RIVER	2AB	From confluence w/ Ham's Fk upstream to an undetermined distance above Smiths Fork.	Fecal Coliform	Undeterm.	DEQ, USGS 9222000	Contact Recreation	2000	L
GR	14040107	HAMS FORK GREEN RIVER	2AB	Exceedences measured at Diamondville.	High pH>9	Point, Undeterm.	DEQ, USGS 9224050, LCCD	Cold Fish, Aquatic Life	1996	**M**
GR	14040107	SMITHS FORK GREEN RIVER	2AB	From confluence with Blacks Fork past Cottonwood Ck.	Habitat Degradation	Non-point Undeterm.	DEQ	Cold Fish, Aquatic Life	2000	L
GR	14040107	SMITHS FORK GREEN RIVER	2AB	From confluence with Blacks Fork an undetermined distance upstream.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
LS	14050003	BATTLE CREEK WEST FORK	2AB	From Battle Cr to Haggarty Ck.	Copper	Point, Natural	USGS 9253465, DEQ	Cold Fish, Aquatic Life	2000	**H**
LS	14050003	HAGGARTY CREEK	2AB	From Ferris-Haggarty Mine to W. Fk. Battle Ck.	Silver	Point	USGS 9253455, DEQ	Cold Fish, Aquatic Life	1996	**H**
LS	14050003	HAGGARTY CREEK	2AB	From Ferris-Haggarty Mine to W. Fk. Battle Ck.	Copper	Point, Natural	USGS 9253455, DEQ	Cold Fish, Aquatic Life	1996	**H**
LS	14050003	HAGGARTY CREEK	2AB	From Ferris-Haggarty Mine to W. Fk. Battle Ck.	Cadmium	Point	USGS 9253455, DEQ	Cold Fish, Aquatic Life	1996	**H**
NP	10180006	CROOKS CREEK	2AB	From SW NE S18 T28N R92W undetermined distance downstream.	Oil Deposits	Undeterm.	DEQ	Cold Fish, Aquatic Life	1998	H
NP	10180007	CASPER CREEK	2AB	In Kendrick Reclamation Project below Casper Canal.	Selenium	Non-point Natural	USFWS, USGS	Cold fish, Aquatic Life, Wildlife	2000	L

Basin	HUC	Name	Class	Location	Cause of Impairment	Sources	Data Sources	Uses Impaired	Date Listed	Priority
NP	10180007	GOOSE LAKE	3B	In Kendrick Reclamation Project.	Selenium	Non-point Natural	USFWS, USGS	Aquatic Life, Wildlife	2000	L
NP	10180007	ILLCO POND	3B	S13 T35N R81W	Selenium	Non-point Natural	USFWS, USGS	Non-game Fish, Aquatic Life, Wildlife	2000	L
NP	10180007	NORTH PLATTE RIVER	2AB	Exceedences measured at Casper. Impairment extends undetermined distance upstream and downstream.	Selenium	Non-point Natural	DEQ, USFWS, USGS 6645000	Cold fish, Aquatic Life, Wildlife	1998	L
NP	10180007	OREGON TRAIL DRAIN	3B	In Kendrick Reclamation Project.	Selenium	Non-point Natural	USFWS, USGS	Aquatic Life, Wildlife	2000	L
NP	10180007	POISON SPIDER CREEK	2AB,2C,3B	In and above Kendrick Reclamation Project.	Selenium	Non-point Natural	USFWS, USGS	Aquatic Life, Fish, Wildlife	2000	L
NP	10180007	POISON SPRING CREEK	3B	In Kendrick Reclamation Project below Casper Canal.	Selenium	Non-point Natural	USFWS, USGS	Aquatic Life, Wildlife	2000	L
NP	10180007	RASMUS LEE LAKE	3B	In Kendrick Reclamation Project.	Selenium	Non-point Natural	USFWS, USGS	Aquatic Life, Wildlife	2000	L
NP	10180007	THIRTYTHREE MILE RESERVOIR	3B	On South Fork Casper Ck in Kendrick Reclamation Project.	Selenium	Non-point Natural	USFWS, USGS	Aquatic Life, Wildlife	2000	L
NP	10180011	ROCK CREEK	2C	Above Town of Wheatland.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
NP	10180011	WHEATLAND CREEK	2C	Impairment undetermined distance above and below Hwy 320.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
PR	10090202	POWDER RIVER	2ABWW	**From S Fk Powder R downstream to the confluence with Crazy Woman Creek.**	Selenium	Natural, Non-point Undeterm.	DEQ, USGS 6313500	Warm Fish, Aquatic Life, Wildlife	2000	L
PR	10090202	POWDER RIVER	2ABWW	**From Salt Ck downstream to the confluence with Clear Creek**	Chloride	Point, Natural	DEQ, USGS 6313500	Warm Fish, Aquatic Life	1998	L
PR	**10090203**	**SOUTH FORK POWDER RIVER**	**2C**	**From confluence with Middle Fork upstream an undetermined distance above Willow Creek**	**Selenium**	**Natural, Non-point Undeterm.**	**Powder River CD, USGS**	**Non-game Fish, Aquatic Life, Wildlife**	**2006**	**L**
PR	**10090203**	**WILLOW CREEK**	**3B**	**From confluence with South Fork Powder R. to an undetermined distance upstream.**	**Selenium**	**Natural, Non-point Undeterm.**	**Powder River CD, USGS**	**Aquatic Life, Wildlife**	**2006**	**L**
PR	10090204	SALT CREEK	2C	From Powder R to an undetermined distance upstream.	Chloride	Point Natural	USGS, Powder River CD	Non-game Fish, Aquatic Life	2002	L
PR	10090205	CRAZY WOMAN CREEK	2ABWW	From Powder R to an undetermined distance upstream.	Manganese	Natural, Undeterm.	USGS 6316400	Drinking Water	2002	**M**
PR	**10090206**	**DALTON DITCH**	**3B**	**Within and near Town of Story**	**Fecal Coliform**	**Undeterm.**	**DEQ**	**Contact Recreation**	**2006**	**H**

Basin	HUC	Name	Class	Location	Cause of Impairment	Sources	Data Sources	Uses Impaired	Date Listed	Priority
PR	**10090206**	**NORTH PINEY CREEK**	**2AB**	**Confluence with South Piney Creek upstream to an undetermined location below SW, NW Sec 12, T53N, R84W**	**Fecal Coliform**	**Undeterm.**	**DEQ**	**Contact Recreation**	**2006**	**H**
PR	**10090207**	**MIDDLE PRONG WILD HORSE CREEK**	**3B**	**Confluence with Wild Horse Creek upstream an undetermined distance**	**Fecal Coliform**	**Undeterm.**	**Campbell CCD**	**Contact Recreation**	**2006**	**H**
PR	**10090208**	**LITTLE POWDER RIVER**	**2AB**	**Wyoming/Montana state line upstream an undetermined distance above Olmstead Creek**	**Fecal Coliform**	**Undeterm.**	**USGS 06324970 Campbell CCD**	**Contact Recreation**	**2002**	**L**
SP	10190009	CROW CREEK	2AB, 2C	Impairment undetermined distance above and below Cheyenne.	Ammonia	Point, Undeterm.	USGS 6756060	Fisheries, Aquatic Life	1996	L
SP	10190009	CROW CREEK	2AB, 2C	Impairment undetermined distance above and below Cheyenne.	Fecal Coliform	Non-point Undeterm.	DEQ	Contact Recreation	1996	L
TR	10090101	BEAVER CREEK	2AB	From Big Goose Ck to an undetermined distance upstream.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
TR	10090101	BIG GOOSE CREEK	2AB	From Sheridan to above Beckton.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	1996	L
TR	10090101	COLUMBUS CREEK	2AB	From confluence with Tongue River an undetermined distance above Highway 14.	Fecal Coliform	Undeterm.	Sheridan CCD	Contact Recreation	2002	L
TR	10090101	FIVE MILE CREEK	3B	From confluence with Tongue River an undetermined distance above Ranchester.	Fecal Coliform	Undeterm.	Sheridan CCD	Contact Recreation	2002	L
TR	10090101	GOOSE CREEK	2AB	From confluence of Big and Little Goose Creeks an undetermined distance downstream.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
TR	**10090101**	**GOOSE CREEK**	**2AB**	**Within City of Sheridan**	**Sediment**	**Non-point Undeterm.**	**DEQ Sheridan CCD**	**Cold Fish, Aquatic Life**	**2006**	**L**
TR	10090101	JACKSON CREEK	2AB	From Little Goose Ck to an undetermined distance upstream.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
TR	10090101	KRUSE CREEK	2AB	From Little Goose Ck to an undetermined distance upstream.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
TR	10090101	LITTLE GOOSE CREEK	2AB	From Sheridan upstream to above Big Horn.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	1996	L
TR	**10090101**	**LITTLE GOOSE CREEK**	**2AB**	**Within City of Sheridan**	**Sediment**	**Non-point Undeterm.**	**DEQ Sheridan CCD**	**Cold Fish, Aquatic Life**	**2006**	**L**
TR	10090101	LITTLE TONGUE RIVER	2AB	From confluence with Tongue River an undetermined distance above Dayton.	Fecal Coliform	Undeterm.	Sheridan CCD	Contact Recreation	2002	L
TR	10090101	McCORMICK CREEK	2AB	From Little Goose Ck to an undetermined distance upstream.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2004	L

Basin	HUC	Name	Class	Location	Cause of Impairment	Sources	Data Sources	Uses Impaired	Date Listed	Priority
TR	10090101	NORTH TONGUE RIVER	1	From confluence of Bull Creek upstream an undetermined distance above Hwy 14A.	Fecal Coliform	Non-point Undeterm.	DEQ	Contact Recreation	2004	L
TR	10090101	PARK CREEK	2AB	From Big Goose Ck to an undetermined distance upstream.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
TR	10090101	PRAIRIE DOG CREEK	2AB	Entire Prairie Dog Creek Drainage.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2004	L
TR	10090101	PRAIRIE DOG CREEK	2AB	From Tongue R to an undetermined distance upstream.	Manganese	Natural, Undeterm.	USGS 06306250	Drinking Water	2002	L
TR	10090101	RAPID CREEK	2AB	From Big Goose Ck to an undetermined distance upstream.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
TR	10090101	SACKET CREEK	2AB	From Little Goose Ck to an undetermined distance upstream.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
TR	10090101	SMITH CREEK	2AB	From confluence with Tongue River an undetermined distance above Dayton.	Fecal Coliform	Undeterm.	Sheridan CCD	Contact Recreation	2002	L
TR	10090101	SOLDIER CREEK	2AB	From Goose Ck to an undetermined distance upstream.	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2000	L
TR	10090101	TONGUE RIVER	2AB	From Goose Ck downstream.	Temperature	Undeterm.	DEQ, Sheridan CCD USGS 06306300	Cold Fish	2002	L

Table B: TMDL 2006 303(d) Waters with NPDES Discharge Permits containing WLAs

Basin & HUC	Water	Class	Facility Name	Permit	TMDLs	Expires
BF10120201	Belle Fourche River	2ABww	Hulett WWTF	WY0020214	Ammonia, Fecal, Chlorine	11/30/2007
BH10080001	Twin Creek	2AB	Meritage Energy Partners, LLC	WY0001210	Radium, Chlorides	6/30/2007
BH10080002	Beaver Creek	3B	Devon Energy Production Company	WY0000248	Radium, Chlorides	6/30/2007
BH10080003	Little Popo Agie River	2AB	Meritage Energy Partners, LLC	WY0001171	Radium, Chlorides	6/30/2007
BH10080007	Big Horn River	2AB	Basin WWTF	WY0020028	Ammonia, Fecal, Chlorine	1/31/2007
BH10080007	Big Horn River	2AB	Worland WWTF	WY0020176	Ammonia, Fecal, Chlorine	4/30/2007
BH10080007	Gooseberry Creek	2C	Phoenix Production Company	WY0000973	Radium, Chlorides	6/30/2007
BH10080009	Rawhide Creek	2AB	Marathon Oil OT	WY0026590	Radium, Chlorides	6/30/2007
BH10080010	Big Horn River	2AB	Greybull WWTF	WY0020583	Ammonia, Fecal, Chlorine	6/30/2007
BH10080014	Bitter Creek	2AB	Powell WWTF	WY0020648	Ammonia, Fecal, Chlorine	7/31/2007
BH10080014	Sage Creek	2AB	Kevin Smith OT	WY0023922	Radium, Chlorides	6/30/2007
BH10080014	Sage Creek	2AB	Breck Operating Corp	WY000485	Radium, Chlorides	6/30/2007
BH10080014	Sage Creek	2AB	Breck Operating Corp	WY003140	Radium, Chlorides	6/30/2007
BH10080014	Sage Creek	2AB	Merit Energy Company	WY0026816	Radium, Chlorides	6/30/2007
BH10080014	Sage Creek	2AB	Whiting Oil, Gas Corporation	WY0001350	Radium, Chlorides	6/30/2007
BH10080014	Shoshone River	2AB	Cody WWTF	WY0020451	Ammonia, Fecal, Chlorine	8/31/2007
BH10080014	Shoshone River	2AB	Western Sugar Company	WY0000418	Ammonia, Temperature	8/31/2007
BR16010101	Bear River	2AB	Bear River WWTF	WY0031712	Ammonia, Fecal, Chlorine	11/30/2007
GR14040101	Green River	2AB	La Barge WWTF	WY0022080	Ammonia, Fecal, Chlorine	11/30/2006
GR14040102	Pine Creek	2AB	Pinedale WWTF	WY0020656	Ammonia, Fecal, Chlorine	9/30/2006
GR14040103	Green River	2AB	Green River WWTF	WY0020443	Ammonia, Fecal, Chlorine	6/30/2006
GR14040107	Blacks Fork River	2AB	Ft. Bridger WWTF	WY0022071	Ammonia, Fecal, Chlorine	12/31/2006
GR14040107	Blacks Fork River	2AB	Granger WWTF	WY0022373	Ammonia, Fecal, Chlorine	9/30/2007
GR14040107	Hams Fork River	2AB	Kemmerer/Diamondville WTP	WY0000116	Chlorine	12/31/2006
NP10180002	Hot Slough	2C	Saratoga WWTF	WY0021491	Ammonia, Fecal, Chlorine	10/31/2007
NP10180002	Hot Slough	2C	Saratoga WTP	WY0020214	Ammonia, Fecal, Chlorine	10/31/2007
NP10180004	Medicine Bow River	2AB	Sonoma Energy Corporation	WY0000787	Radium, Chlorides	6/30/2007
NP10180005	Spring Creek	2AB	Pathfinder Mines Corporation	WY0001252	Selenium, Zinc, Radium	7/31/2006
NP10180010	Laramie River	2AB	Union Pacific Railroad	WY0032590	Copper, Iron, Zinc, Pentachlorophenol, TDS	6/30/2006
PR10090206	Clear Creek	2AB	Buffalo WWTF	WY0021024	Ammonia, Fecal, Chlorine	11/30/2006
SP14040101	Crow Creek	2AB	Sinclair Oil	WY0021326	Ammonia	7/31/2007

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Table C: 2006 303(d) Waters with Water Quality Threats

Basin	HUC	Name	Class	Location	Cause of WQ Threat	Sources	Data sources	Threatened Uses	Date Listed	Priority
BR	16010101	BRIDGER CREEK	3B	Utah Line Upstream	Habitat Degradation	Non-point	Bear Lake Regional Commission	Aquatic Life	1998	L
BH	10080005	POISON CREEK	2AB	From Boysen Reservoir upstream an undetermined distance	Fecal Coliform	Undeterm.	USGS 06255500	Contact Recreation	2002	L
BH	10080005	MUDDY CREEK	2AB	From Boysen Reservoir upstream an undetermined distance	Fecal Coliform	Undeterm.	USGS 06258000	Contact Recreation	2002	L
BH	10080007	BIGHORN RIVER	2AB	Confluence with Nowood River upstream an undetermined distance above the City of Worland	Fecal Coliform	Undeterm.	USGS 06268600, 441138107545501, 06269500, DEQ	Contact Recreation	2002	L
BH	10080007	FIFTEEN MILE CREEK	3B	Confluence with Bighorn River upstream an undetermined distance	Fecal Coliform	Undeterm.	USGS 440044107584301	Contact Recreation	2002	L
BH	**10080007**	**KIRBY CREEK**	**2C**	**Confluence with the Bighorn River upstream to an undetermined distance above Lake Creek**	**Fecal Coliform**	**Undeterm.**	**USGS 433653107504501 434227107541501 434331107565701**	**Contact Recreation**	**2006**	**L**
BH	10080007	NOWATER CREEK	3B	Confluence with Bighorn River upstream an undetermined distance	Fecal Coliform	Undeterm.	USGS 06267420	Contact Recreation	2002	L
BH	10080007	OWL CREEK	2AB	Confluence with Bighorn River upstream an undetermined distance	Fecal Coliform	Undeterm.	USGS 06264500 DEQ	Contact Recreation	2002	L
BH	10080007	SAGE CREEK	3B	Confluence with Bighorn River upstream an undetermined distance	Fecal Coliform	Undeterm.	USGS 440045107581401	Contact Recreation	2002	L
BH	10080007	SLICK CREEK	3B	Confluence with Bighorn River upstream an undetermined distance	Fecal Coliform	Undeterm.	USGS 062686600	Contact Recreation	2002	L
BH	10080008	PAINTROCK CREEK	2AB	Confluence with Nowood River upstream an undetermined distance	Fecal Coliform	Undeterm.	DEQ	Contact Recreation	2002	L
BH	10080010	BEAVER CREEK	2AB	Confluence with Shell Creek Upstream an undetermined distance	Fecal Coliform	Undeterm.	USGS 443229107503501	Contact Recreation	2002	L
BH	10080011	DRY CREEK	2ABWW	Confluence with Bighorn River upstream an undetermined distance	Fecal Coliform	Undeterm.	USGS 443055108252101, 06278000	Contact Recreation	2002	L
BH	10080014	FOSTER GULCH	2C	Confluence with Shoshone River upstream an undetermined distance	Fecal Coliform	Undeterm.	USGS 444932108254201	Contact Recreation	2002	L
CR	10120107	POISON CREEK	3B	S16-17 T46N R63W	Oil Seeps	Point, Undeterm.	DEQ, WOGCC	Wildlife, Aquatic Life	2000	L
GR	14040107	WILLOW CREEK	2AB	From confluence with Smiths Fork upstream to Utah Line	Habitat Degradation	Non-point	DEQ, Uinta CCD	Cold Fish, Aquatic Life	1998	L
LS	14050003	LOCO CREEK W FK	2AB	All of West Fork Watershed above Loco Creek.	Habitat Degradation, Nutrients, Temperature	Non-point	Little Snake River CD	Cold Fish, Aquatic Life	1996	**M**

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Basin	HUC	Name	Class	Location	Cause of WQ Threat	Sources	Data sources	Threatened Uses	Date Listed	Priority
LS	14050003	SAVERY CREEK	2AB	Below Little Sandstone Creek to Little Snake River	Habitat Degradation	Non-point	Little Snake River CD	Cold Fish, Aquatic Life	1998	**M**
LS	14050004	MCKINNEY CREEK	2AB	Above Muddy Creek to Eagle Creek.	Habitat Degradation	Non-point	Little Snake River CD	Cold Fish, Aquatic Life	1996	**M**
LS	14050004	MUDDY CREEK	2C	West of State Hwy 789.	Habitat Degradation	Non-point	Little Snake River CD	Non-game Fish, Aquatic Life	1996	**M**
LS	14050004	MUDDY CREEK	2AB	Above Alamosa Gulch to Littlefield Creek.	Habitat Degradation	Non-point	Little Snake River CD	Cold Fish, Aquatic Life	1996	**M**
NP	10180002	SAGE CREEK	2AB	From confluence with North Platte River to State Hwy 71.	Habitat Degradation	Non-point	Saratoga-Encampment-Rawlins CD	Cold Fish, Aquatic Life	1996	L
NP	10180011	CHUGWATER CREEK	2AB	**Above irrigation diversion in NE SW S26 T25N R67W upstream an undetermined distance below Antelope Gap Road**	Habitat Degradation, Sediment	Non-Point, Undeterm.	DEQ	Cold Fish, Aquatic Life	2000	L
PR	10090205	CRAZY WOMAN CREEK NORTH FK	2AB	Reaches within T49N R82W.	Habitat Degradation, Nutrients	Non-point	Crazy Woman Watershed improvement District	Cold Fish, Aquatic Life	1996	**M**
PR	10090206	SHELL CREEK N FK	3B	Above Shell Creek Reservoir	Habitat Degradation	Non-point	Lake DeSmet CD	Aquatic Life	2000	**M**
PR	10090206	SHELL CREEK S FK	3B	Above Shell Creek Reservoir	Habitat Degradation	Non-point	Lake DeSmet CD	Aquatic Life	2000	**M**
SR	17040101	SPREAD CREEK NORTH FK	2AB	1 mile reach in S13&14 T44N R111W.	Habitat Degradation	Non-point	Bridger-Teton NF	Cold Fish, Aquatic Life	1998	**M**
SR	17040103	FLAT CREEK	2AB	Between Snake River, Cache Creek	Habitat Degradation	Non-point	Teton County NRD	Cold Fish, Aquatic Life	2000	**L**
SR	17040105	SALT RIVER	2AB	Undetermined distance upstream, downstream of Gaging Station (3.4 Miles NW of Etna)	Fecal Coliform	Undeterm.	USGS 13027500	Contact Recreation	2002	L
TR	10090101	WOLF CREEK	2AB	From confluence with Tongue River an undetermined distance above County Road 67	Fecal Coliform	Undeterm.	Sheridan CCD	Contact Recreation	2002	L

Table D: Waters Delisted from Wyoming's 2004 303(d) List

Basin& HUC	Name	Class	Location	Former Impairments/Threats	Listing Reason	Delisting Reason
BF10120201	Belle Fourche River	2ABww	Undetermined distance below Hulett WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020214 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
BF10120201	Donkey Creek	3B	Undetermined distance below Pacificorp Discharge	Copper, Iron	WY0001384 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
BH10080001	Wind River	2AB	Undetermined distance below Dubois WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020834 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
BH10080003	Popo Agie River	2AB	Undetermined distance below Lander WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020389 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
BH10080008	East Tensleep Creek	2AB	Undetermined distance below Big Horn Mtn. Resort WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0042218 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
BH10080008	Tensleep Creek	2AB	Undetermined distance below Tensleep WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020168 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
BH10080014	Shoshone River	2AB	Undetermined distance below Byron WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020281 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
BH10080014	Shoshone River	2AB	Undetermined distance below Lovell WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020061 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
BH10090009	Beck-Allen Canal	4A	Undetermined distance below Burlington WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0034606 WLA Re-evaluation	Classification of Beck-Allen Canal changed to 4A. No longer threatened.
BR16010101	Bear River	2AB	Undetermined distance below Evanston WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020095 WLA Re-evaluation	Facility only discharges to Yellow Creek. No longer discharges to Bear River. No longer threatened.
BR16010101	Yellow Creek	2C	Undetermined distance below Evanston WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020095 WLA Re-evaluation	TMDL submitted 11/2/2005. Move to Category 4A.
GR14040101	N. Piney Creek	2AB	Undetermined distance below Big Piney WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020133 WLA Re-evaluation	TMDL submitted 7/25/2005. Move to Category 4A.
GR14040101	Reardon Draw	3B	Lower 3 miles from confluence with Green River.	Habitat Degradation	Listed due to project to address excessive sediment loading to Green River	Listing was due to 319 project in Milleson Draw Watershed to protect Green River. Reardon Draw improperly listed.
GR14040107	EAST FK SMITHS FK	2AB	From confluence with West Fork upstream to Utah Line.	Habitat Degradation	319 Watershed Project to address Habitat Degradation	DEQ Assessment shows fully supporting aquatic life uses.
GR14040107	WEST FK SMITHS FK	2AB	From confluence with East Fork upstream to Utah Line.	Habitat Degradation	319 Watershed Project to address Habitat Degradation	DEQ Assessment shows fully supporting aquatic life uses.
LS14050003	Ledford Slough	2C	Undetermined distance below Baggs WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0022888 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.

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Basin& HUC	Name	Class	Location	Former Impairments/Threats	Listing Reason	Delisting Reason
LS14050003	Little Snake River	2AB	Undetermined distance below Dixon WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0021938 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
NP10180002	Hot Slough Creek	2C	Undetermined distance below Saratoga Water Treatment Plant Discharge	Residual Chlorine	WY0020214 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
NP10180002	Hot Slough Creek	2C	Undetermined distance below Saratoga WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0021491 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
NP10180007	North Platte River	2AB	Undetermined distance below Glenrock WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020630 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
NP10180009	Rawhide Creek	2AB	Undetermined distance below Lingle WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0021849 WLA Re-evaluation	TMDL submitted 11/21/2005. Move to Category 4A.
NP10180010	Laramie River	2AB	Undetermined distance below Laramie WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0022209 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
NP10180011	Wheatland Creek	2C	Undetermined distance below Wheatland WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020150 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
PR10090201	Middle Fork Powder R.	2AB	Undetermined distance below Kaycee WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0021733 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
PR10090204	Salt Creek	2C	Downstream of Oil Fields	Oil Spills	Oil spills common in drainage	Oil Spills regulated by other Environmental Laws. Move to Category 4B.
PR10090206	Clear Creek	2AB	Undetermined distance below Clearmont WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0022063 WLA Re-evaluation	TMDL submitted 7/25/2005. Move to Category 4A.
PR10090206	Piney Creek	2AB	Undetermined distance below J.M. Huber Corp. Discharge	Chlorides, Radium 226	WY0038903, WY0038911, WY0038920 WLA Re-evaluation	EPA Approved TMDL, but permits de-activated. No longer threatened.
SP10190009	Middle Crow Creek	2AB	Exceedences measured at FS Road 700.	Fecal Coliform	Fecal Coliform Criterion Exceeded	Medicine Bow National Forest Water Quality Action Plan will address Impairment. Move to Category 4B.
SP10190009	North Branch North Fork Crow Creek	2AB	Exceedences measured at FS Road 701.	Fecal Coliform	Fecal Coliform Criterion Exceeded	Medicine Bow National Forest Water Quality Action Plan will address Impairment. Move to Category 4B.
TR10090101	North Fork Tongue River	1	Undetermined distance below US Forest Service WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0020931 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
TR10090101	Prairie Dog Creek	2AB	Undetermined distance below J.M. Huber Corp. Discharge	Chlorides, Radium 226	WY0038857 WLA Re-evaluation	EPA Approved TMDL. Move to Category 4A.
TR10090101	Tongue River	2AB	Undetermined distance below Ranchester WWTP Discharge	Ammonia, Chlorine, Fecal Coliform	WY0022161 WLA Re-evaluation	Submitted 6/21/2005. Move to Category 4A.

Basin& HUC	Name	Class	Location	Former Impairments/Threats	Listing Reason	Delisting Reason
YR10070006	Clarks Fork Yellowstone River	1	Exceedences measured at Montana border. Impairment undetermined distance below.	Cadmium, Copper, Silver	Metals Criteria exceeded from Montana	EPA Approved TMDLs in Montana. Move to Category 4A.