Coeur d'Alene Lake Subbasin
17010303

TMDL Five-Year Review

Draft

Department of Environmental Quality

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Acknowledgments

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Executive Summary

This document presents a five-year review of the Coeur d'Alene Lake Subbasin (hydrologic unit code [HUC] 17010303) Subbasin Assessment (SBA) and Proposed Total Maximum Daily Load (TMDL) (*Coeur d'Alene Lake and River TMDL)*. The TMDL addresses sediment and bacteria impairments in Cougar Creek, Kid Creek, Latour Creek, Mica Creek, and Wolf Lodge Creek, and it was approved by the U.S. Environmental Protection Agency (EPA) in 2000. This five-year review has been developed to comply with Idaho Statute 39-3611 (7), and it includes an evaluation of the water quality criteria, instream targets, pollutant allocations, assumptions and analyses upon which the TMDL was made. Much of the conclusions made in this document are based on water quality data, monitoring, assessments, reports, procedures described in the Coeur d'Alene Lake and River Subbasin Assessment Update (Addendum 1 to the *Coeur d'Alene Lake and River TMDL*). Results thereof, coupled with information on TMDL implementation activities, has been sufficient for an evaluation of TMDL implementation progress. Table 1 lists the general status of these streams.

Table 1: Existing TMDLs and General Status.

Stream	[1]Assessment Unit	Pollutant(s)	Implementation Activities	WQ Trend
Cougar Creek	ID170103033PN002_02	Habitat Alteration, Temperature, Sediment	Some at the mouth	Static - Improving
Kid Creek	ID170103033PN003_02	Habitat Alteration, Sediment	Many	Improving
Latour Creek	ID170103033PN015_02	Sediment, Temperature	Recent	Static
Mica Creek	ID170103033PN004_02 ID170103033PN004_03	Habitat Alteration, Fecal Coliform, Sediment	Recent	Improving
Upper Wolf Lodge Creek	ID170103033PN029_02	Sediment, Temperature,	Many	Improving
Lower Wolf Lodge Creek	ID170103033PN029_03	Sediment, Temperature, Habitat Alteration (29_03)	None	Static

Section 2: Introduction

The federal Clean Water Act (CWA) requires that states and tribes restore and maintain the chemical, physical, and biological integrity of the nation's waters. States and tribes, pursuant to Section 303 of the CWA, are to adopt water quality standards necessary to protect fish, shellfish, and wildlife while providing for recreation in and on the nation's waters whenever possible. Section 303(d) of the CWA establishes requirements for states and tribes to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). In addition, states and tribes must periodically publish a priority list (a "§303(d) list") of impaired waters. For waters identified on this list, states and tribes must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards.

Idaho Statute 39-3611(7) requires a five-year cyclic review process for Idaho TMDLs:

> The director shall review and reevaluate each TMDL, supporting subbasin assessment, implementation plan(s) and all available data periodically at intervals of no greater than five (5) years. Such reviews shall include the assessments required by section 39-3607, Idaho Code, and an evaluation of the water quality criteria, instream targets, pollutant allocations, assumptions and analyses upon which the TMDL and subbasin assessment were based. If the members of the watershed advisory group, with the concurrence of the basin advisory group, advise the director that the water quality standards, the subbasin assessment, or the implementation plan(s) are not attainable or are inappropriate based upon supporting data, the director shall initiate the process or processes to determine whether to make recommended modifications. The director shall report to the legislature annually the results of such reviews.

This report is intended to meet the intent and purpose of Idaho Statute 39-3611(7). The report documents the review of an EPA-approved Idaho TMDL and implementation plan. It provides consideration of the most current and applicable information in conformance with Idaho Statute 39-3607, which includes an evaluation of the appropriateness of the TMDL to current watershed conditions, an evaluation of the implementation plan, and consultation with the Watershed Advisory Group (WAG). An evaluation of the recommendations presented is provided. Final decisions for TMDL modifications are decided by the Department of Environmental Quality (DEQ) Director. Approval of TMDL modifications is decided by the U.S. EPA, with consultation by DEQ.

About Assessment Units

Since 2002, all streams in the Subbasin that are part of the 1:100,000 national hydrography dataset (NHD) are divided by DEQ into assessment units (AUs) for tracking assessment and management. Each AU receives an identification number (e.g., ID17010303PN001_02) and these are used to track and report the status of stream segments and lakes. AUS are groups of similar streams with similar land use practices, ownership, or land management. Stream order and watershed boundaries are the main basis for determining AUS; streams with similar stream orders are grouped together and are usually split when stream order changes or when crossing a major watershed. Prior to 2002, impaired waters were defined as stream segments with geographical descriptive boundaries.

Section 3: TMDL Review and Status

Approved TMDLs in the Subbasin

In 1998 and 1999, DEQ conducted a subbasin assessment and developed the *Coeur d'Alene Lake and River (17010303) Subbasin Assessment and Proposed Total Maximum Daily Loads* (*Coeur d'Alene Lake and River TMDL*) to address sediment and bacteria impairments in the subbasin (DEQ 1999). The streams and their assessment units addressed in this TMDL are listed in Table 2. The TMDL can be accessed from a complete list of Idaho's Subbasin Assessments, TMDLs, and Implementation Plans at DEQs Web site: http://www.deq.idaho.gov/water/data_reports/surface_water/tmdls/sba_tmdl_master_list.cfm.

Table 2: Impaired water bodies with approved TMDLs prescribed in the *Coeur d'Alene Lake and River (17010303) Subbasin Assessment and Proposed Total Maximum Daily Loads*

Watershed	Watershed Acres	Streams Addressed in the TMDL	Assessment Unit	Pollutant
Cougar Creek	10,711	Cougar, North Fork Cougar, Unnamed Tributary to Cougar Creek	ID17010303PN001_02 ID17010303PN002_02	Sediment
Kid Creek	3,738	Kid Creek	ID17010303PN003_02	Sediment
Latour Creek	33,359	Latour, Baldy, Butler, Larch	ID17010303PN015_02	Sediment
Mica Creek	14,941	Mica, North Fork Mica, South Fork Mica	ID17010303PN001_02 ID17010303PN004_03	Bacteria Sediment
Wolf Lodge Creek	39,720	Wolf Lodge, Stella, Phantom, Blue Grouse, Lonesome, Halladay, Unnamed Tributary to Wolf Lodge Creek, Marie Creek and its tributaries, Cedar Creek and its tributaries	ID17010303PN029_02 ID17010303PN029_03 ID17010303PN030_02 ID17010303PN030_03 ID17010303PN031_02	Sediment

Sediment TMDLs

Idaho's water quality standard for sediment is a narrative standard which states, "sediment shall not exceed quantities . . . which impair designated beneficial uses" (IDAPA 58.01.02.200.08). A narrative standard is appropriate due to the enormous variability among stream channels in their ability to transport and store sediment and how this relates to beneficial use support. In the absence of numeric criterion, a TMDL plan defines site-specific sediment conditions that support beneficial uses in that stream. The *Coeur d'Alene Lake and River TMDL* evaluated sediment impairment to streams on Idaho's 1998 §303(d) list in the Coeur d'Alene Lake Subbasin (HUC 17010303) by estimating sediment yield to streams using sediment transport model coefficients and GIS.

Sediment Load Estimates

Sediment loading estimates were based primarily on sources of sediment from land use types and road characteristics. Details of sediment yield estimates can be read in the *Coeur d'Alene Lake and River TMDL*. Sediment yields were estimated separately for each land use type using the following equation:

Total acreage for each land use type * Sediment yield coefficient = Sediment yield from land use

Total sediment load for each subwatershed is provided in Tables X-X. The sediment yield coefficient for pasture was estimated by the Idaho Soil Conservation Commission using the Revised Universal Soil Loss Equation (RUSLE) (Hogen personal communication, 1998). The sediment yield coefficient for forested land was based on sediment production rates used in the U.S. Forest Service WATSED model. Appropriate sediment yield coefficients were selected based on local characteristics within the watershed. All sediment delivery estimates were assumed to be 100 percent delivery to the stream channel. The land use sediment delivery estimates were conservative in the TMDL.

Sediment loading from potential road crossing failure on forested land was estimated from the CWE data base on road fill failure and delivery in the Wolf Lodge Creek watershed. In the TMDL, the CWE data was divided by 10 using the assumption that fill failures occur primarily during runoff events with a 10-15 year recurrence interval. Roads within 50 feet of stream were assumed to be encroaching on the stream and a cause for increased stream bed/bank erosion. The sediment delivery estimates from fill failure and road encroachment were conservative in the TMDL.

County and private road surface erosion was estimated with the RUSLE model and the coefficients were applied to the area of road 200 feet on either side of stream crossings. Road fill failure and encroachment of county and private roads were evaluated the same as the forest roads. In the TMDL, it was assumed that a quarter inch of erosion occurs on each lineal foot of bank and bed up to three feet in height. The sediment delivery estimates from roads were conservative in the TMDL.

The TMDL did not consider sediment routing, nor did it attempt to estimate erosion to stream beds and banks resulting from localized sediment deposition in the stream bed. It also did not attempt to measure effects of additional water capture at road crossing.

Field surveys were conducted by the Natural Resources Conservation Service (NRCS) to estimate bank recession on Wolf Lodge Creek. The rate was converted to a load of to be 33 tons/yr on Wolf Lodge Creek. Erosion to stream beds and banks was not estimated for other streams.

Load Reduction Targets and Watershed Load Capacity

In the absence of numeric criterion, one goal of a TMDL plan is to develop a numeric target which is an interpretation of the narrative sediment criterion for a stream in a particular watershed. For sediment, this could be site-specific numeric targets for total suspended sediment (TSS), percent embeddedness, or other instream sediment parameters. These targets are then used to develop the load capacity of a stream. The *Coeur d'Alene Lake and River TMDL* did not set numeric sediment targets; rather it established an interim load capacity of the streams based on the following assumptions:

- Natural background levels of sedimentation would be fully supportive of the beneficial uses;
- The stream system would have some finite, yet unquantified ability to process (attenuate through export and/or deposition) a sedimentation rate greater than background rates;
- The beneficial use would be fully supported when the finite, yet unquantified ability of the stream system to process (attenuate) sediment is met; and
- Care would be taken to control factors which may interfere with the quantification of beneficial use support.

Given these assumptions, the interim load capacity prescribed for each subwatershed in the *Coeur d'Alene Lake and River TMDL* was equal to natural background conditions. This was calculated by multiplying the WATSED yield coefficient for an undisturbed conifer forest (0.023 tons/acre/year) by the watershed acres (Table 3).

Table 3: Interim Load Capacity in the Coeur d'Alene Lake Subbasin

Watershed	Pollutant	Estimated Yield to Stream (tons/yr)	Interim Load Capacity (Natural Background) (tons/year)	Load Reduction (percent)	Margin of Safety (percent)
Cougar Creek	Sediment	467	407	12.8	164
Kid Creek	Sediment	176.3	142	19.4	164
Latour Creek	Sediment	893	767	14.1	231
Mica Creek	Sediment	648.1	568	12.3	164
Wolf Lodge Creek	Sediment	1,157	910	21.0	231

Load Allocations

Although it is well understood that streams have the ability to process sediment levels above natural background levels, there is no general formula to determine the load capacity of a stream. Determination of the sediment load capacity of the stream must be done on an individual basis. This is the basis of Idaho's narrative criteria for sediment. Determination of the sediment load capacity at which beneficial uses are not impaired by sediment has been set at various levels in TMDLs developed by the DEQ. These have ranged from an interim load capacity at natural background to a load capacity more than 200 percent above background in some areas of the state. The *Coeur d'Alene Lake and River TMDL* prescribed load allocations for sediment to meet the interim load capacity (natural background) relative to the modeled sediment contributions per land use (Table 4). No waste load allocations were prescribed, as no point sources were identified in these watersheds.

Table 4: TMDL Load Allocations and Load Reduction by Land Use (in Tons Per Year)

Watershed	U.S. Forest Service		Private Forest		State Forest		Agriculture/ Ranchettes		BLM	
	[1]LA	[2]LR	LA	LR	LA	LR	LR	LA	LR	LR
Cougar Creek	--	--	291	42.9	16	2.4	100	14.7	--	--
Kid Creek			75	18	--	--	67	16.3	--	--
Latour Creek	23	4	294	48	175	29	77	13	175	28
Mica Creek	--	--	432	60.9	24	3.5	99	13.9	13	1.8
Wolf Lodge Creek	655	178	108	29	--	--	71/ 76	19/ 21	--	--

[1]LA = Load Allocation, [2]LR = Load Reduction

Margin of Safety

While the *Coeur d'Alene Lake and River TMDL* interim load target for the creeks at natural background levels of sedimentation, it used a series of conservative assumptions when calculating load estimates to each subwatershed (Table X.). These conservative assumptions translate to a margin of error which is much larger than other sediment TMDLs developed by DEQ. An explicit margin of safety (MOS) was not built into the TMDL. As stated earlier, the conservative assumptions built into the load estimates were the following:

- 100 percent delivery from forest lands estimated with WATSED coefficients and from agricultural lands estimated with RUSLE.
- 100 percent delivery from all road miles up to 200 feet from a stream crossing.
- 100 percent delivery for roads within 50 feet of the stream.
- Fill failure estimations developed from CWE field assessments was over-estimated by 60 percent.

Evaluate applicability and appropriateness of MOS.

Seasonal Variation

No seasonal load capacities and allocations were developed in the *Coeur d'Alene Lake and River TMDL*.

Reserve

No allowance was made for future growth (e.g., new or expanded point sources or expansion of nonpoint source activities) in the *Coeur d'Alene Lake and River TMDL*.

Analysis of Attainment of Sediment Load Capacity and Beneficial Use Support

The *Coeur d'Alene Lake and River TMDL* stated that as load reduction activities take place in the watershed, the watersheds will attain the sediment load capacity of the stream at which full support of beneficial uses of the stream will be met. Beneficial uses related to sediment as a pollutant to be supported in this water body are cold water aquatic life and salmonid spawning. The appropriate sediment loading capacity is described in the *Coeur d'Alene Lake and River TMDL* as meeting the following measures of full cold water biota support:

- Three or more age classes of trout with one young of the year,
- Trout density at reference levels of 0.1 – 0.3 trout per square meter
- Presence of sculpin,
- Macroinvertebrate Biotic Index (MBI) score of 3.5 or greater

Although these measures are components of an assessment index, they are not all conclusive in determining beneficial use support of a water body. As defined in Water Body Assessment Guidance (WBAG II: DEQ 2002), assessment of beneficial use support in Idaho is primarily based on the evaluation of Tier I biological data. Tier I data is defined in WBAG II as data with the highest scientific rigor and relevance requirements. Examples of Tier I data is the DEQ BURP, the EPA Environmental Management Assessment Program (EMAP), graduate degree theses, or a peer-reviewed publication, report, or model.

There may be cases where sediment is not the only pollutant which impairs beneficial uses. The integrity of stream biota is not only affected by excess sediment, but it is also affected by conditions such as alterations in flow, temperature, oxygen content, and habitat structure. This is the case on the streams addressed in this TMDL, which are also listed on Idaho's Integrated Report for habitat alteration and exceedances of the state's

temperature water quality criteria. Therefore, while it is important to look at beneficial use support through the analysis of BURP or other Tier I data, it is possible a stream can reach its sediment load capacity and still not be fully supportive of beneficial uses. Therefore, appropriate measures should also be selected to understand the sediment load capacity of individual streams and how it directly relates to beneficial use support.

As part of the five-year review of the *Coeur d'Alene Lake and River TMDL*, DEQ collected and compiled data on each of the TMDL streams to understand land-use changes and implementation activities that have occurred in the watershed, and to understand current sediment transport/deposition processes in the creek, and whether load reduction requirements set in the TMDL have been met. Details of the subbasin assessment update are provided in the Subbasin Assessment Update in Addendum I of the *Coeur d'Alene Lake and River TMDL*.

Cougar Creek

The Cougar Creek assessment unit (ID1701033PN02_02) is included in Idaho's draft 2010 Integrated Report as *not supporting* cold water aquatic life and salmonid spawning beneficial uses. The cause of impairment is listed as habitat alteration, sedimentation, and temperature. The *Coeur d'Alene Lake and River TMDL* identified the sediment interfering with the beneficial use in Cougar Creek is moderate to fine grain sands. It set an interim load target for the Cougar Creek assessment unit at natural background levels of sedimentation at 407 tons/year. This required a 12.8 percent reduction of sediment load from the 467 tons/yr estimated in the TMDL.

Recent assessments by DEQ and IDL have provided insight as to the sediment conditions of the Cougar Creek and cold water aquatic life and salmonid spawning beneficial use support. Wetlands restoration near the mouth of Cougar Creek and the elimination of livestock pressure to the stream channel just upstream has resulted in marked improvement to streambank stability at the mouth of the watershed and an overall reduction of sediment in that reach. Cougar Gulch conservation easements – I have a call into the Inland NW Land Trust. However, excessive amounts of fine sediment still exists in the watershed as a result of residential development, an increase in roads, mass wasting, and excessive channel erosion – especially on private land. As such, it is reasonable to assume Cougar Creek is still functioning at a sediment transport/deposition rate above its sediment load capacity. As such, the excess sedimentation is contributing to the impairment of cold water aquatic life and salmonid spawning beneficial uses. Therefore, it is recommended Cougar Creek remain in section 4a of Idaho's Integrated Report as impaired for sediment and be subject to load reductions defined in the *Coeur d'Alene Lake and River TMDL*.

Kid Creek

The Kid Creek assessment unit (ID17010303PN03_02) is included in Idaho's draft 2010 Integrated Report as *not supporting* the cold water aquatic life beneficial use. The causes of the beneficial use impairment are habitat alteration and sediment. The *Coeur d'Alene Lake and River TMDL* identified the sediment interfering with the beneficial use within Kid Creek is most likely large bedload particles that is mobilized during large discharge events (return period of 10-15 years). It set an interim load target for the Kid Creek assessment unit at natural background levels of sedimentation at 142 tons/year. This was a 19.4 percent reduction from the 176 tons/yr estimated in the TMDL.

Recent field surveys indicate there are localized areas of concern for erosion and sedimentation in Kid Creek, and there are numerous culverts along the creek which pose a challenge to fish passage and may be a future risk for excess sedimentation. Despite these localized problems, the stream generally has abundant riparian vegetation, good stream bank stability, no excess fine sediment in the channel bed, and good access to the floodplain. In addition, there is no indication of excess bedload as evidenced by large, instream depositional features. This improvement within the stream channel may be attributed to the installation of riparian buffers, upland sediment ponds, and grade control structures within the creek which has resulted in a reduction of sediment load to the creek. In light of this information, Kid Creek may be functioning at its sediment load capacity. Due to the numerous culverts and localized areas of concern, more analysis is needed before any

assessment decisions for the Integrated Report are made. It is also recommended Kid Creek be re-assessed for beneficial use support using BURP. Until these assessments are made, it is recommended Kid Creek remain on section 4a of Idaho's Integrated Report as impaired for sediment, and it will be subject to load reductions defined in the *Coeur d'Alene Lake and River TMDL*.

Latour Creek

The Latour Creek assessment unit (ID17010303PN015_02) is listed in Idaho's draft 2010 Integrated Report as *not supporting* cold water aquatic life and salmonid spawning beneficial uses. The causes of impairment are sediment and temperature. The *CDA Lake and River Subbasin Assessment* identified the sediment interfering with the beneficial use within the Latour Creek watersheds is most likely large bedload particles that is mobilized during large discharge events (return period of 10-15 years). The *Coeur d'Alene Lake and River TMDL* set an interim load target for Latour Creek at natural background levels of sedimentation at 767 tons/year. This was a 14.1 percent reduction from the 893 tons/yr estimated in the TMDL.

As is the case with many streams within the Coeur d'Alene Lake watershed, Latour Creek has an excessive amount of bedload that causes lateral migration of the stream channel resulting in erosion of the stream banks and poor channel stability. This negatively affects aquatic life in the channel and is likely a factor in exceedances of Idaho temperature Water Quality Standards. In addition, there is a large amount of mass wasting in the headwaters of the watershed. Due to this source of sediment along with an increase in road miles since 1999, it is likely that the excessive bedload will remain in the system for a very long time, and channel instability and erosion of stream banks from lateral displacement of flow will continue to be a concern.

Although much work has recently been done by IDL to mitigate sediment sources in the Latour Creek watershed, the above factors are a weight of evidence that 1) Latour Creek is functioning at a sediment transport/deposition rate well above natural background; 2) there are still significant sources of excess sediment to the system; and 3) significant land management changes need to occur before Latour Creek can process (attenuate through export and/or deposition) a sedimentation rate that supports the cold water aquatic life beneficial use. Therefore, it is reasonable to conclude the 14.1 percent decrease in sediment loading target for Latour Creek set in the TMDL has not been met, and it is recommended Latour Creek remain in section 4a of Idaho's Integrated Report as an impaired stream for sediment and be subject to load reductions defined in the *Coeur d'Alene Lake and River TMDL*.

Mica Creek

The Mica Creek assessment unit (ID17010303PN004_02 and ID17010303PN004_03) is listed in Idaho's draft 2010 Integrated Report as *not supporting* cold water aquatic life and salmonid spawning beneficial uses. The cause of impairment is sedimentation, habitat alteration, and fecal coliform. The *CDA Lake and River Subbasin Assessment* identified the sediment interfering with the beneficial use in Mica Creek is moderate to fine grain sands. The *Coeur d'Alene Lake and River TMDL* set an interim load target for the Mica Creek assessment unit at natural background levels of sedimentation at 767 tons/year. This is a 14.1 percent reduction from the 893 tons/yr estimated in the TMDL.

Since 1999, there has been a 72 percent increase in road miles, and an order of magnitude increase in the amount of acres under timber harvest. Although much change has occurred in the Mica Creek watershed, not all the changes translate into a negative impact to the beneficial use of the creek. Much implementation activity has been occurring within in the lower watershed — all of which targeted toward decreasing sedimentation in Mica Creek. However, this work has just been completed within the last few years, and not enough time has elapsed to expect significant change within the sediment transport/deposition rates in the channel. Future monitoring will provide very useful information as to any improvements that take place, and it will assist with any beneficial use support evaluations. As such, it is reasonable to assume the 14.1 percent sediment load reduction has not been met in Mica Creek, and it is recommended Mica Creek remain in section

4a of Idaho's Integrated Report as impaired stream for sediment and be subject to load restrictions defined in the *Coeur d'Alene Lake and River TMDL*.

Wolf Lodge Creek

The *Coeur d'Alene Lake and River TMDL* sets an interim load target for the entire Wolf Lodge Creek watershed, which includes Wolf Lodge, Marie, and Cedar Creeks and all their tributaries. The *CDA Lake and River Subbasin Assessment* identified the sediment interfering with the beneficial use within the Wolf Lodge Creek watersheds is most likely large bedload particles that is mobilized during large discharge events (return period of 10-15 years). The load target is set at natural background levels of sedimentation at 910 tons/year. This is a 21 percent reduction from the 1,157 tons/yr estimated in the TMDL.

Upper Wolf Lodge Creek

The Upper Wolf Lodge Creek assessment unit (ID17010303PN29_02) is on Idaho's draft 2010 Integrated Report as *fully supporting* primary contact recreation, but *not supporting* cold water aquatic life and salmonid spawning beneficial uses. The cause of impairment is due to temperature and sediment.

On a watershed scale, the forest canopy in upper Wolf Lodge Creek is recovering from historic logging activity, and riparian zones are free from recent logging activity. In addition, within the USFS property, a number of roads have been decommissioned or put into storage, and culverts were replaced or removed. USFS models show a 14 percent decrease in sediment load from their property. However, in the lower reaches of this subwatershed, there is indication Stella Creek are functioning at a sediment transport/deposition rate well above their load capacities. Data indicate a large amount of bedload in the streams, which causes an erosional process that leads to stream channel instability, channel widening, loss of large woody debris, pool filling, and fine sediment movement into interstitial spaces — all of which negatively affect the aquatic life and salmonid spawning beneficial use support. There is additional concern over the lower reaches of this assessment unit which are on private property. Levy installation on lower Stella Creek has significantly altered stream channel hydraulics in that reach. As a result, there has been channel widening and an increase in the load of sediment transported to lower Wolf Lodge Creek downstream.

In conclusion, a large amount of implementation has occurred in this watershed to diminish the sediment sources to the stream channels. Yet, there still exists a high bedload influence on channel instability in Stella Creek. This, coupled with channel alteration on private property on lower Stella Creek is contributing to sediment impairment of the beneficial uses within the watershed. Any change in landuse activity may exacerbate the channel instability problem. Therefore, there is weight of evidence that the sediment transport/deposition rate in the upper Wolf Lodge Creek watershed is above the load capacity of the streams, and it is reasonable to believe the load reductions defined in the *Coeur d'Alene Lake and River TMDL* have not been met. Therefore, it is recommended that upper Wolf Lodge Creek remain in section 4a of Idaho's Integrated Report as an for sediment, and be subject to load reductions defined in the *Coeur d'Alene Lake and River TMDL*.

Lower Wolf Lodge Creek

The lower Wolf Lodge Creek assessment unit (ID7010303PN29_03) on Idaho's draft 2010 Integrated Report as *not supporting* beneficial uses for cold water aquatic life and salmonid spawning due to habitat alteration, sediment, and temperature. This has been verified by recent failing BURP scores in 2006 on lower Wolf Lodge Creek.

As is the case in upper Wolf Lodge Creek, high bedload is the cause for impairment of the beneficial use. To exacerbate the problem, localized areas of extreme erosion exist, which are likely caused by development, stream modification, channelization, and upstream dike construction. In addition, there is no known restoration work in the lower Wolf Lodge Creek watershed.

In conclusion, there is weight of evidence that 1) lower Wolf Lodge Creek is functioning at a sediment transport/deposition rate well above natural background; 2) habitat quality and macroinvertebrate populations

are poor; and 3) significant land management changes need to occur before lower Wolf Lodge Creek can process (attenuate through export and/or deposition) a sedimentation rate that supports the cold water aquatic life beneficial use. Therefore, it is recommended lower Wolf Lodge Creek remain in section 4a of Idaho's Integrated Report, and it will remain under the restriction of the *2000 Coeur d'Alene Lake Tributaries TMDL*.

Marie Creek

The Marie Creek (ID17010303PN031_02) assessment unit is listed in Idaho's draft 2010 Integrated Report as not supporting cold water aquatic life and salmonid spawning beneficial use. The cause of impairment is habitat alteration, sedimentation, and temperature. The basis for this listing was verified with failing BURP scores in 2006 on the mouth of Marie Creek.

Recent field visits observed localized areas of excessive aggradation in the Marie Creek. Albeit present in less frequency than in Stella Creek, the excessive bedload in Marie Creek ultimately negatively affects beneficial use support. The USFS has done a significant amount of restoration work in the upper watershed which has decreased sediment loading by 8 percent. Field visits on Marie Creek within USFS property observed well-vegetated riparian areas, good streambank/channel stability, good pool-to-riffle ratios, and low percent fines in the creek. Recent BURP data from Skitwish Creek, a tributary to Marie Creek, indicate this tributary is fully supporting the cold water aquatic life use.

In conclusion, although there is still evidence of localized areas of excessive bedload and channel instability, there is reasonable assumption Marie Creek is on a trajectory toward reaching its load capacity for sediment — as long as a new source of bedload does not materialize. Any change in landuse activity may exacerbate the existing channel instability/erosion problem and reverse the trajectory. Therefore, it is recommended that Marie Creek remain in section 4a of IDEQ Integrated Report, and be subject to the load reductions described in the *2000 Coeur d'Alene Lake Tributaries TMDL*.

Cedar Creek

The Cedar Creek (ID17010303PN030_02 and ID17010303PN030_03) assessment unit is listed in Idaho's draft 2010 Integrated Report as not supporting cold water aquatic life and salmonid spawning beneficial uses. The cause of impairment is sedimentation, and temperature. The basis for this listing was verified by failing BURP scores in 2006 at the mouth of Cedar Creek.

The non-supporting status of Cedar Creek can be explained by the high road density in the upper watershed, geomorphic restrictions on Cedar Creek caused by the highway, and temperature criteria exceedances. Although recent restoration work by the USFS has reduced the sediment load by 25 percent on their property, recent field investigations by the USFS observed aggradation and large amounts of sand near the mouth of Cedar Creek. Such observations are symptoms that the creek is still functioning above its sediment load capacity. Therefore, it is recommended the assessment will remain in section 4a of IDEQ Integrated Report and be subject to the load reductions of the *2000 Coeur d'Alene Lake Tributaries TMDL*.

Bacteria TMDL

Idaho's water quality standard for bacteria states "waters designated for primary or secondary contact recreation are not to contain E. coli bacteria in concentrations exceeding a geometric mean of one hundred twenty-six (126) E. coli organisms per one hundred (100) ml based on a minimum of five (5) samples taken every three (3) to seven (7) days over a thirty (30) day period." The *Coeur d'Alene Lake and River TMDL* estimated bacteria loading in Mica Creek using the geometric mean taken from data collected in July and August 1999 and a mean summer discharge assumed for Mica Creek and North Fork Mica Creek. The loading capacity was calculated using the geometric mean for E. coli bacteria and the mean summer discharge assumed for Mica Creek and North Fork Mica Creek. This included a 20 percent margin of safety. From those numbers an E. coli percent reduction was calculated (Table 5).

Table 5. Estimates of E. Coli bacteria loads and percent load reduction required in Mica and NF Mica Creeks.

Stream	Load Capacity (E. Coli per day)	Estimated Load (E. coli per day)	Percent Reduction
Mica Creek	9.87×10^{9}	5.41×10^{10}	81.8
North Fork Mica Creek	6.66×10^{9}	1.43×10^{10}	53.3

References Cited

Clean Water Act (Federal water pollution control act), 33 U.S.C. § 1251-1387. 1972.

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Idaho Code § 39.3611. Development and implementation of total maximum daily load or equivalent processes.

IDAPA 58.01.02. Idaho water quality standards and wastewater treatment requirements.

Water Quality Act of 1987, Public Law 100-4. 1987.