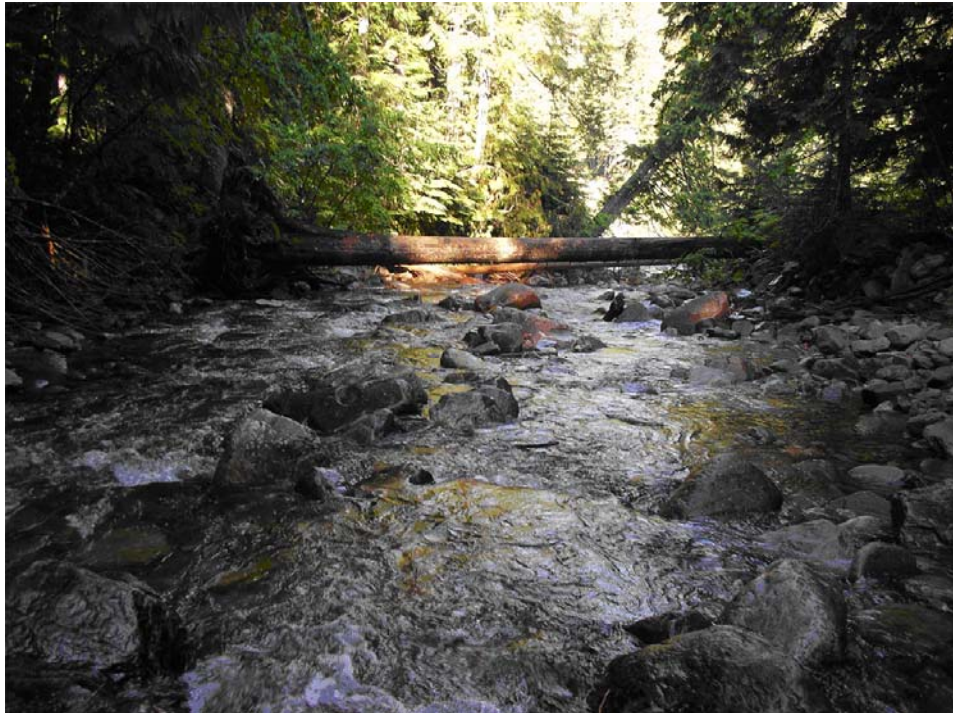


Lower Clark Fork River Subbasin Assessment and Total Maximum Daily Loads



Final



Department of Environmental Quality

2007

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**Final
June 2007**

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Table of Contents

Acknowledgments..... i

Table of Contents..... ii

List of Tables.....viii

List of Figures x

Abbreviations, Acronyms, and Symbols xi

Executive Summaryxiii

 Subbasin at a Glance.....xiv

 Key Findings xvii

1. Subbasin Assessment – Watershed Characterization 1

 1.1 Introduction 1

 Background..... 1

 Idaho’s Role 2

 Public Participation 3

 1.2 Physical and Biological Characteristics 5

 Climate..... 5

 Subbasin Characteristics 6

Hydrography 6

Geology 8

Topography 11

Vegetation 11

Fisheries and Aquatic Fauna..... 12

 Subwatershed Characteristics 15

 Stream Characteristics..... 16

Clark Fork River..... 16

Cougar and Spring Creek..... 17

Derr Creek..... 17

Twin and Dry Creeks..... 17

East Fork and Savage Creeks..... 17

Johnson Creek 17

Lightning Creek 18

Rattle Creek..... 18

Wellington Creek 18

West Fork of Blue Creek 19

West Fork of Elk Creek..... 19

Cascade Creek..... 19

 1.3 Cultural Characteristics..... 19

 Land Use 19

 Land Ownership, Cultural Features, and Population 21

 History and Economics 23

2. Subbasin Assessment – Water Quality Concerns and Status24

 2.1 Water Quality Limited Assessment Units Occurring in the Subbasin.....24

 About Assessment Units.....24

 Impaired Waters.....25

 2.2 Applicable Water Quality Standards28

 Beneficial Uses28

Existing Uses.....28

Designated Uses28

Presumed Uses.....28

 Criteria to Support Beneficial Uses30

 2.3 Pollutant/Beneficial Use Support Status Relationships.....34

 Temperature34

 Dissolved Oxygen34

 Total Dissolved Gas35

 Metals35

 Sediment.....36

 Sediment-Temperature Relationship37

 Bacteria.....37

 Nutrients.....38

 Sediment – Nutrient Relationship39

 Floating, Suspended, or Submerged Matter (Nuisance Algae)39

 2.4 Summary and Analysis of Existing Water Quality Data40

 Data Sources40

 Flow Characteristics.....44

Clark Fork River.....44

Lightning Creek45

 Water Column Data47

Clark Fork River.....47

Lower Lightning Creek.....47

Temperature47

Dissolved Oxygen.....48

Total Dissolved Gas49

Metals49

 Biological and Other Data53

Lower Clark Fork River.....53

Lightning Creek54

 Status of Beneficial Uses57

 Conclusions57

 2.5 Data Gaps.....58

3. Subbasin Assessment–Pollutant Source Inventory60

 3.1 Sources of Pollutants of Concern.....60

 Point Sources.....60

 Nonpoint Sources61

Sediment61

Temperature.....62

Total Dissolved Gas (TDG)62

Metals.....63

 Pollutant Transport.....63

Sediment63

<i>Temperature</i>	63
<i>Total Dissolved Gas</i>	63
<i>Metals</i>	63
3.2 Data Gaps.....	64
Point Sources	64
Nonpoint Sources	64
4. Subbasin Assessment – Summary of Past and Present Pollution Control Efforts.....	65
Point Source Pollution Permits	65
Nonpoint Source	66
<i>Forested Land/Roads</i>	66
<i>Agricultural</i>	66
<i>Bull Trout Restoration Projects</i>	67
<i>Nutrient Reduction Projects</i>	67
<i>Total Dissolved Gas Reduction Projects</i>	67
5. Total Maximum Daily Load(s)	69
5.1A Cadmium, Copper and Zinc In-stream Water Quality Targets	70
Design Conditions.....	70
Target Selection.....	70
Monitoring Points	70
5.2A Cadmium, Copper and Zinc Load Capacity	70
5.3 A Estimates of Existing Pollutant Loads of Cadmium, Copper and Zinc	72
5.4A Load Allocation for Cadmium, Copper and Zinc	73
Waste Load Allocation	73
Load Allocation	73
Margin of Safety.....	73
Seasonal Variation.....	74
Reasonable Assurance.....	74
Background.....	74
Reserve	74
Remaining Available Load	74
5.5A Implementation Strategies for Cadmium, Copper and Zinc	75
Time Frame and Approach	75
Responsible Parties	75
Monitoring Strategy.....	75
5.1B Temperature In-stream Water Quality Targets	76
Potential Natural Vegetation Method	76
<i>Solar Pathfinder Methodology</i>	77
<i>Existing Shade Estimation</i>	78
<i>Stream Width Determination</i>	79
Design Conditions.....	82
<i>Forested Tributaries</i>	82
<i>Lower Clark Fork River and Associated Low Gradient Stream Sections</i>	83
<i>Target Selection</i>	83
Monitoring Points	86
5.2B Temperature Load Capacity	87
5.3B Estimates of Existing Pollutant Loads Temperature	87
5.4B Temperature Load Allocation.....	99
Margin of Safety.....	101

Seasonal Variation..... 101

5.5B Temperature Implementation Strategies..... 102

 Time Frame..... 102

 Approach..... 102

 Responsible Parties 102

 Monitoring Strategy..... 102

5.1c Sediment In-stream Water Quality Targets..... 103

 Design Conditions..... 103

 Target Selection..... 103

Sediment Model Development 103

 Monitoring Points 104

5.2 c Load Capacity Sediment..... 105

5.3 c Estimates of Existing Pollutant Loads Sediment..... 107

5.4 c Load Allocations Sediment..... 111

 Waste load Allocation 111

 Load Allocation 111

 Margin of Safety..... 118

 Seasonal Variation..... 118

 Reasonable Assurance..... 118

 Background..... 118

 Reserve..... 119

5.5 c Implementation Strategies Sediment 119

 Time Frame..... 119

 Approach..... 120

 Responsible Parties 120

 Monitoring Strategy..... 120

5.1D In-stream Water Quality Targets Total Dissolved Gas (TDG)..... 120

 Design Conditions..... 120

 Target Selection..... 120

 Monitoring Points 121

5.2 D Load Capacity TDG..... 121

5.3 D Estimates of Existing Pollutant Loads TDG 121

 Nonpoint Source Existing Load..... 121

5.4 D Load Allocation TDG 123

 Clark Fork River - Idaho/Montana border to Cabinet Gorge Dam
 (17010213PN005_08)..... 123

 Clark Fork River – Cabinet Gorge Dam to Lake Pend Oreille (17010213PN003_08
 and PN001_08)..... 124

 Margin of Safety..... 124

 Seasonal Variation..... 124

 Reasonable Assurance..... 124

 Background..... 124

 Reserve..... 124

5.5 D Implementation Strategies TDG 124

 Time Frame..... 124

 Approach..... 125

 Responsible Parties 125

 Monitoring Strategy..... 125

5.6 Construction Storm Water and TMDL Waste Load Allocations..... 126

 Construction Storm Water..... 126

 The Construction General Permit (CGP) 126

Storm Water Pollution Prevention Plan (SWPPP)	126
Construction Storm Water Requirements	126
5.7 Application of Existing Nutrient Agreements and Lake Pend Oreille Nearshore	
TMDL	126
Idaho-Montana Nutrient Border Agreement.....	127
Pend Oreille Lake Nearshore TMDL.....	127
5.8 Conclusions	127
References Cited	131
<i>GIS Coverages</i>	136
Glossary.....	137
Appendix A. Water Body Summary Information Tables.....	156
Appendix B. Select Water Column Data for USGS Stations at Cabinet Gorge and Lightning Creek	175
Appendix C. USGS and Tri-State Water Quality Council metals samples below Cabinet Gorge Dam	179
Appendix D. 2006 Idaho Water Quality Standards for Cadmium and Sample Calculations for Metals Standards	184
2006 Idaho Water Quality Standards for Cadmium	184
Sample Calculations	185
Hardness Dependent Criteria Formulas	185
Load Calculations	185
Appendix E. State and Site-Specific Standards and Temperature Criteria.....	186
Appendix F. Temperature Loading Tables.....	187
Appendix G. Lower Clark Fork River Subbasin Sediment Model Methodology	212
Lower Clark Fork River Subbasin Sediment Model	212
Land use types	212
<i>Forest (natural background)</i>	212
<i>Forest Roads</i>	213
<i>Agriculture</i>	214
<i>Wild fire</i>	215
<i>Harvested areas</i>	215
<i>Mass wasting</i>	215
Sediment Coefficients	217
<i>Sediment Delivery Assumptions</i>	218
Target Selection.....	219
<i>Allocating Loads</i>	221
<i>Assessment of Model's Margin of Safety</i>	224
<i>Model Verification</i>	224

References..... 224

Appendix H. Daily Sediment Load Targets 233

Appendix I. Total Dissolved Gas Summary..... 238

Appendix J. Unit Conversion Chart 240

Appendix K. Data Sources 242

Appendix L. Distribution List..... 243

Appendix M. Public Comments 244

List of Tables

Table 1. Streams and pollutants for which TMDLs were developed.....	xviii
Table 2. Summary of assessment outcomes.....	xix
Table 3. Fishes in the Lower Clark Fork River Subbasin ¹	13
Table 4. Watershed Characteristics of the Lower Clark Fork River Subbasin.....	15
Table 5. Impaired water bodies in the Lower Clark Fork River Subbasin identified in the 2002 Integrated Report Section 5.	25
Table 6. Lower Clark Fork Subbasin beneficial uses of streams that have not been assessed.....	29
Table 7. Selected numeric criteria supportive of designated beneficial uses in Idaho water quality standards.....	31
Table 8. Peak flows for Lightning Creek USGS gage by water year, 1989-2003. (Reproduced from PWA 2004).....	46
Table 9. Temperature criteria exceedances in the Idaho portion of the Lower Clark Fork HUC.....	48
Table 10. EPA approved standards for hardness dependent toxic metals at the minimum measured hardness level. Standards were calculated using hardness based conversion formula outlined in IDAPA 58.01.02.210.02 (IAC 2005).....	51
Table 11. Summary of available dissolved Cadmium, Zinc and Copper data in the Lower Clark Fork River.....	51
Table 12. Date, Flow and Data Source information for metals samples that exceeded Idaho Water Quality Standards.....	52
Table 13. BURP Sites and Index Scores for Lower Clark Fork River subwatersheds.....	55
Table 14. SMI, SFI and SHI scores for BURP monitoring data.....	56
Table 15. NPDES permitted discharges into the Lower Clark Fork River in Idaho.....	61
Table 16. Load Capacity of the Lower Clark Fork River for Cadmium.....	71
Table 17. Load Capacity of the Lower Clark Fork River for Copper.....	71
Table 18. Load Capacity of the Lower Clark Fork River for Zinc.....	72
Table 19. Existing Cadmium Load at time of exceedance.....	72
Table 20. Existing Copper Load at time of exceedance.....	72
Table 21. Example cadmium load reductions at exceedance conditions.....	73
Table 22. Example copper load reduction at exceedance conditions.....	73
Table 23. Sources of cadmium, copper and zinc load allocations for Lower Clark Fork River Assessment Units in Idaho.....	75
Table 24. Effective Shade Targets for the Forest Tributaries Vegetation Type.....	85
Table 25. Effective Shade Targets for the Forest/Shrub Mix Vegetation Type.....	86
Table 26. Solar Pathfinder Field Verification Results.....	88
Table 27. Excess Solar Load and Percent Reduction to Achieve Loading Capacity for the Lower Clark Fork River Tributaries.....	99
Table 28. Excess Solar Load and Percent Reduction to Achieve Loading Capacity for Lightning Creek and Associated Tributaries.....	100
Table 29. Points of compliance for sediment limited watersheds in the Lower Clark Fork River Subbasin.....	105
Table 30. Current sediment load, background load and load capacity (target loads) for sediment impaired watersheds.....	106
Table 31. Current loads from nonpoint sources in Rattle Creek.....	107
Table 32. Current loads from nonpoint sources in Wellington Creek.....	107
Table 33. Current loads from nonpoint sources in Quartz Creek.....	108
Table 34. Current loads from nonpoint sources in Savage Creek.....	108

Table 35. Current loads from nonpoint sources in Johnson Creek. 108

Table 36. Current loads from nonpoint sources in Twin Creek. 109

Table 37. Current loads from nonpoint sources in Lightning Creek mainstem. 109

Table 38. Sediment load allocations and load reductions required within the Lower Clark Fork River Subbasin, Idaho..... 111

Table 39. Assessment Units contributing to the Lightning Creek TMDL..... 112

Table 40. Load allocations for privately owned land within the Twin Creek watershed. 114

Table 41. Load allocations for USFS managed land within the Twin Creek watershed..... 114

Table 42. Load allocations for privately owned land within the Johnson Creek watershed. 114

Table 43. Load allocations for BLM managed land within the Johnson Creek watershed.. 115

Table 44. Load allocations for USFS managed land within the Johnson Creek watershed. 115

Table 45. Load allocations for Military owned land within the Johnson Creek watershed. . 115

Table 46. Load allocations for USFS managed land within the Rattle Creek watershed... 115

Table 47. Load allocations for USFS managed land within the Wellington Creek watershed. 116

Table 48. Load allocations for USFS managed land within the Quartz Creek watershed. . 116

Table 49. Load allocations for (USFS) managed land within the Lightning Creek watershed. 117

Table 50. Load allocations for BLM managed land within the Lightning Creek watershed. 117

Table 51. Load allocations for state (IDFG) managed land within the Lightning Creek watershed..... 117

Table 52. Load allocations for privately owned land within the Lightning Creek watershed. 118

Table 53. Background sediment loads..... 119

Table 54. Summary of Existing TDG loads above and below Cabinet Gorge dam. 122

Table 55. Summary of assessment outcomes. 128

List of Figures

Figure 1. Location of the Lower Clark Fork River Subbasin.	xiv
Figure 2. Streams in the Lower Clark Fork River Subbasin identified as impaired in Section 5 of the 2002 Integrated Report.	xvi
Figure 3. Lower Clark Fork River Watersheds, Hydrography, Weather, and Gaging Station.	7
Figure 4. Geology of the Lower Clark Fork Subbasin.	10
Figure 5. Lower Clark Fork Subbasin Land Use and Roads.	20
Figure 6. Land Ownership in the Lower Clark Fork River Basin.	22
Figure 7. Determination Steps and Criteria for Determining Support Status of Beneficial Uses in Wadeable Streams: <i>Water Body Assessment Guidance</i> , Second Addition (Grafe et al 2002).	33
Figure 8. Locations of BURP monitoring sites, 1994-2002.	42
Figure 9. Mean Daily Flow of the Clark Fork River at USGS Gaging Station Below the Cabinet Gorge Dam.	44
Figure 10. Mean Daily Flow of Lightning at USGS Gaging Station near Clark Fork, Idaho.	45
Figure 11. Bankfull Width as a Function of Width to Depth Ratio and Drainage Area.	80
Figure 12. Bankfull Channel Dimensions as a Function of Drainage Area (Rosgen 1996).	81
Figure 13. Estimated Existing Shade (%) in the Lightning Creek drainages.	90
Figure 14. Target Shade (%) for the Lightning Creek Drainage.	91
Figure 15. Estimated Increase in Shade (%) Required to Meet TMDL Targets in the Lightning Creek Drainage.	92
Figure 16. Existing Shade (%) Estimated Johnson Creek, Derr and Mosquito Creeks by Aerial Photo Interpretation.	93
Figure 17. Target Shade (%) for Johnson, Derr and Mosquito Creeks.	94
Figure 18. Estimated Increase in Shade (%) to Meet TMDL target in Johnson, Derr and Mosquito Creeks.	95
Figure 19. Existing Shade (%) Estimated for Twin, Gold and Dry Creeks by Aerial Photo Interpretation.	96
Figure 20. Target Shade (%) Estimated for Twin, Gold and Dry Creeks.	97
Figure 21. Estimated Increase in Shade (%) Needed to Meet Target for Twin, Gold and Dry Creeks.	98
Figure 22. Modeled land use types in the Lower Clark Fork River Subbasin, Idaho.	110
Figure 23. Sediment Reductions (%) by watershed.	113
Figure 24. Measured Downstream TDG levels from Cabinet Gorge using "Best Gate" data points. (Reproduced from Avista 2004b).	123

Abbreviations, Acronyms, and Symbols

§303(d)	Refers to section 303 subsection (d) of the Clean Water Act, or a list of impaired water bodies required by this section of the Act	CWE	cumulative watershed effects
μ	micro, one-one thousandth	DEQ	Department of Environmental Quality
§	Section (usually a section of federal or state rules or statutes)	DO	dissolved oxygen
ADB	assessment database	DOI	U.S. Department of the Interior
AU	assessment unit	DWS	domestic water supply
AWS	agricultural water supply	EPA	United States Environmental Protection Agency
BAG	Basin Advisory Group	ESA	Endangered Species Act
BLM	United States Bureau of Land Management	F	Fahrenheit
BMP	best management practice	FPA	Idaho Forest Practices Act
BOD	biochemical oxygen demand	FWS	U.S. Fish and Wildlife Service
Btu	British thermal unit	GIS	Geographical Information Systems
BURP	Beneficial Use Reconnaissance Program	HUC	Hydrologic Unit Code
C	Celsius	IDAPA	Refers to citations of Idaho administrative rules
CFR	Code of Federal Regulations (refers to citations in the federal administrative rules)	IDFG	Idaho Department of Fish and Game
cfs	cubic feet per second	IDL	Idaho Department of Lands
cm	centimeters	INFISH	the federal Inland Native Fish Strategy
CWA	Clean Water Act	km	kilometer
CWAL	cold water aquatic life	km²	square kilometer
		LA	load allocation

LC	load capacity	SS	salmonid spawning
m	meter	TDG	total dissolved gas
m³	cubic meter	TIN	total inorganic nitrogen
mi	mile	TKN	total Kjeldahl nitrogen
mi²	square miles	TMDL	total maximum daily load
mg/L	milligrams per liter	TP	total phosphorus
mm	millimeter	TS	total solids
MOS	margin of safety	TSS	total suspended solids
MWMT	maximum weekly maximum temperature	t/y	tons per year
NB	natural background	U.S.	United States
NFS	not fully supporting	USDA	United States Department of Agriculture
NPDES	National Pollutant Discharge Elimination System	USFS	United States Forest Service
NRCS	Natural Resources Conservation Service	USGS	United States Geological Survey
NTU	nephelometric turbidity unit	WAG	Watershed Advisory Group
PCR	primary contact recreation	WBAG	<i>Water Body Assessment Guidance</i>
SBA	subbasin assessment	WLA	wasteload allocation
SCR	secondary contact recreation	WQS	water quality standard
SFI	DEQ's Stream Fish Index		
SHI	DEQ's Stream Habitat Index		
SMI	DEQ's Stream Macroinvertebrate Index		
SRP	soluble reactive phosphorus		

Executive Summary

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). States and tribes must periodically publish a priority list (a "§303(d) list") of impaired waters. This list must be published every two years. 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 and protect beneficial uses.

This document addresses the water bodies in the Lower Clark Fork River Subbasin that have been identified as impaired in Section 5 of Idaho's 2002 Integrated Report, commonly referred to as the "303(d) list". The assessment describes the physical, biological, and cultural setting; water quality status; pollutant sources; and recent pollution control actions in the Lower Clark Fork River Subbasin, located in north Idaho. The document was prepared by DEQ in consultation with a local watershed advisory group representing a broad range of stakeholders in the subbasin.

The first part of this document is the Subbasin Assessment (SBA). The starting point for this assessment was Idaho's 2002 Integrated Report. Twenty-five assessment units in eleven water bodies in the Lower Clark Fork River Subbasin are listed as water quality limited in the Integrated Report. The SBA examines the current status of all assessed water bodies in the subbasin and defines the extent of impairment and causes of water quality limitation in those listed as water quality limited. The TMDL analysis quantifies pollutant sources and allocates responsibility for load reductions needed to return impaired waters to a condition of supporting beneficial uses.

Subbasin at a Glance

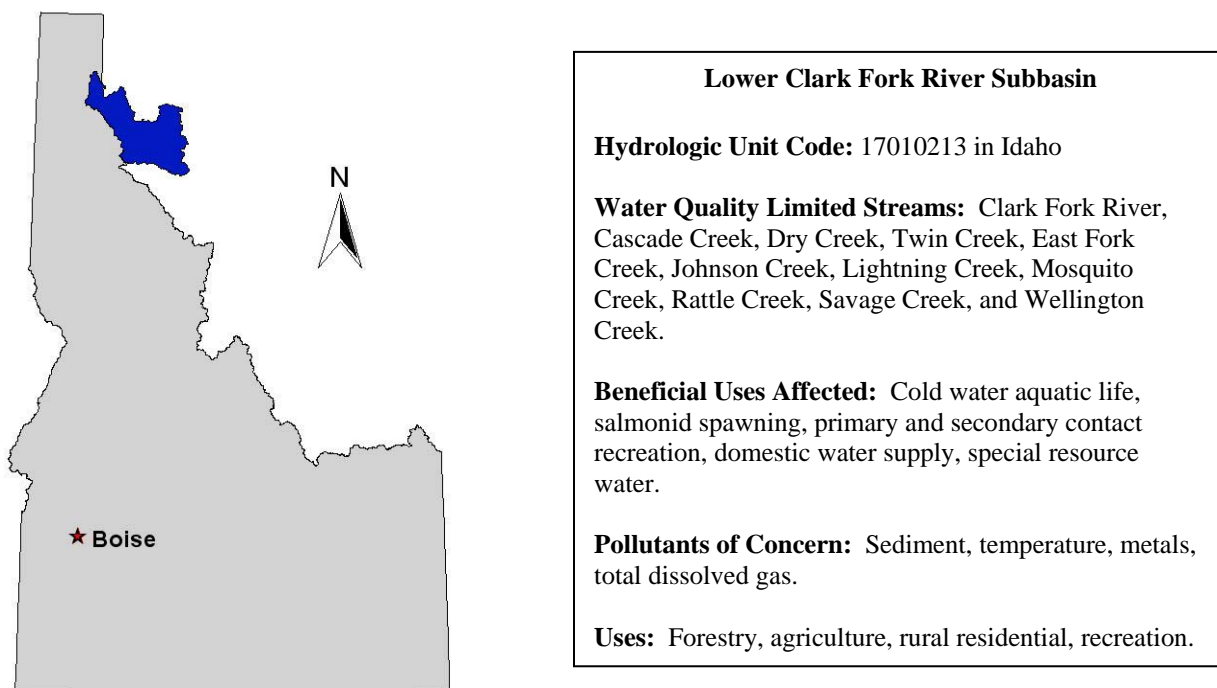


Figure 1. Location of the Lower Clark Fork River Subbasin.

Primarily located in the state of Montana, the 320 mile long Clark Fork River, hydrologic unit code 17010213, flows from near Butte, Montana to Lake Pend Oreille in Idaho (Figure 1). This document addresses the lower most 247 square miles of the subbasin located in north Idaho. The headwaters of the Clark Fork River originate in northwest Montana in the Silver Bow mountains, and by the time it reaches its terminus in Pend Oreille Lake, the river has drained over 22,000 square miles.

The Lower Clark Fork River provides over 92% of the inflow to Lake Pend Oreille, the recreational and economic hub of the area. The Lightning Creek watershed, its largest tributary in Idaho, harbors a regionally significant bull trout population and supports many other native fish. With approximately 75 % of the subbasin in public ownership, there is a diversity of recreational opportunities, as well as substantial wildlife habitat. Both the mainstem Lower Clark Fork River and Lightning Creek are designated Special Resource Waters by the state of Idaho. Special protections of beneficial uses in these waters are given in recognition of their outstanding or unique characteristics. Primarily, this designation prohibits additional point source pollution permits to protect current beneficial uses.

The mainstem of the Lower Clark Fork River exceeds several of the State of Idaho's water quality standards, as do many of its tributaries. There are twenty-five water quality limited assessment units that will be addressed in this document. These water bodies represent portions of the Lower Clark Fork River Subbasin in Idaho and its tributaries.

Idaho DEQ's annual stream monitoring data, other existing stream surveys, and water quality samples were used to determine whether designated and existing beneficial uses of streams

are being supported. Existing beneficial uses include cold water aquatic life, salmonid spawning, primary contact recreation, domestic water supply, and special resource waters.

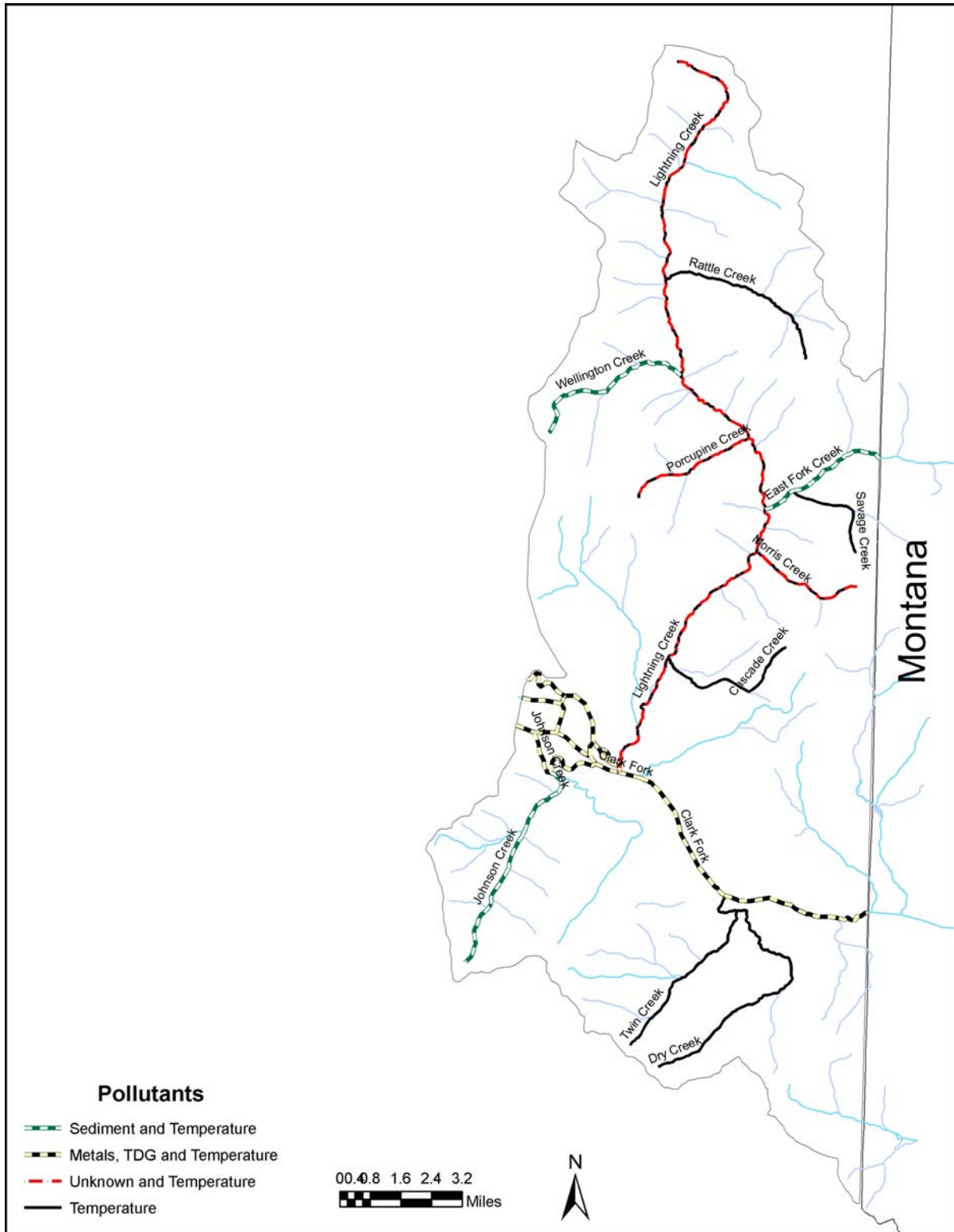


Figure 2. Streams in the Lower Clark Fork River Subbasin identified as impaired in Section 5 of the 2002 Integrated Report.

Total Maximum Daily Loads (TMDLs) were developed for each stream determined to not fully support beneficial uses in accordance with state of Idaho water quality standards. The TMDLs included in this document address in-stream sediment, metal, and temperature reduction goals to maintain or restore cold water aquatic life and salmonid spawning in the tributaries. Cadmium, zinc, copper and Total Dissolved Gas TMDLs were developed for the main stem Clark Fork River. Sediment and temperature TMDLs were developed in the Lightning Creek drainage, Twin and Johnson Creeks. The total maximum daily loads help quantify needed improvements and target management actions to address water quality improvement measures and timelines.

Key Findings

Pollutants of concern identified during the assessment for this process are sediment, temperature, metals, and total dissolved gas (Table 1). Several water bodies were found to be biologically impaired, though the pollutants were unknown at the time of listing. The TMDL process helped identify the pollutants causing impairment in these systems and suggests changes to the Integrated Report to reflect these determinations. Assessment outcomes are summarized in Table 2.

Metals and Total Dissolved Gas pollution are the pollutants of concern in the mainstem Clark Fork River. Intensive mining around the headwaters of the Clark Fork River in Montana left residues of heavy metals behind, which still pose a risk to water quality throughout the basin. The Cabinet Gorge hydropower project is located in Idaho just downstream from the Montana/Idaho border and has been operating on the Lower Clark Fork River since 1952. With additional hydropower facilities upstream, the flows and habitat conditions for native aquatic species in the entire Clark Fork River system have been extensively altered by hydropower development. As a condition of obtaining a federal license to operate the hydropower facility in 2001, a collaborative group of stakeholders and resource agencies partnered with Avista, the operator of the Cabinet Gorge Dam, to direct mitigation measures aimed at restoring water quality and native fish populations in the entire Lower Clark Fork River Subbasin.

Temperature is identified as a pollutant in the Lower Clark Fork River below the Idaho/Montana border. The Lower Clark Fork River on the Montana side of the border has not been found to violate Montana water quality standards for temperature. To better address this issue at a watershed level, Idaho and Montana will investigate available information before the five-year review of this TMDL. Temperature will remain in Section 5 of Idaho's Integrated Report until this time.

Current assessments do not show the Lower Clark Fork River to be impaired by nutrients below Cabinet Gorge dam. Because of the sheer volume of water entering the lake from the Clark Fork, there is a bi-state agreement between Idaho and Montana to limit nutrient contributions to Lake Pend Oreille, where there is a nutrient TMDL established to protect the nearshore area of the lake.

Sediment and temperature are the pollutants of concern in the tributaries to the Lower Clark Fork River. In addition to flow and habitat alterations in the system, thick glacial outwash sediments in steep drainages combined with timber harvest and road construction have created potential sediment problems in several of the tributaries to the Clark Fork River.

Temperatures exceed water quality standards for salmonid spawning throughout the subbasin. Fire and historic timber harvest have created a more open canopy and related stream warming compared to background conditions. A model of potential natural vegetation was created to identify areas of concern where the current solar heating differs greatly from background solar heating conditions.

Figure 2 shows Lower Clark Fork River Subbasin assessment units identified as impaired in the 2002 Integrated Report, and the pollutants for which TMDLs were developed. Table 2 summarizes assessment outcomes by assessment unit and defines boundaries. The 2002 Integrated Report identified Twin Creek, Wellington Creek, Savage Creek and Rattle Creek as impaired by temperature, and the subbasin assessment process identified sediment as an additional pollutant and TMDLs were completed.

Table 1. Streams and pollutants for which TMDLs were developed.

Stream	Pollutant(s)
Clark Fork River	Metals (Cadmium, Copper, Zinc), TDG
Cascade Creek	Temperature
Dry Creek	Temperature
Mosquito Creek	Temperature
Twin Creek	Sediment, Temperature
East Fork Creek	Sediment, Temperature
Johnson Creek	Sediment, Temperature
Lightning Creek	Sediment, Temperature
Rattle Creek	Sediment, Temperature
Savage Creek	Sediment, Temperature
Wellington Creek	Sediment, Temperature

Table 2. Summary of assessment outcomes.

Stream	Assessment Unit	Pollutant	TMDL(s) Completed	Recommended Changes to the 2002 Integrated Report	Justification
Clark Fork River	ID 170213PN005_08 ID 170213PN003_08 ID 170213PN001_08	TDG	Yes	Move to section 4a*	TMDL Completed
		Metals	Yes	Identify metals as cadmium, copper and zinc; Move to section 4a	TMDL Completed
		Unknown	No	Remove pollutant from integrated report	All known pollutants for these assessment units are identified; Flaws in the original analysis of data and information led to the segment being incorrectly listed for this pollutant
		Temperature	No	None	Inadequate information available for a TMDL at this time
Cascade Creek	ID170213PN012_02	Temperature	Yes	Move to section 4a	TMDL Completed
Dry Creek	ID17010213PN004_02a	Temperature	Yes	Move to section 4a	TMDL Completed
Mosquito Creek	ID170213PN009_02	Temperature	Yes	Move to section 4a	TMDL Completed
Lightning Creek	ID17010213PN010_04 ID17010213PN011_02 ID17010213PN011_04 ID17010213PN013_02 ID17010213PN013_04 ID17010213PN016_02	Sediment	Yes	Remove unknown pollutant and move to section 4a	Unknown pollutant identified as sediment and TMDL completed

Stream	Assessment Unit	Pollutant	TMDL(s) Completed	Recommended Changes to the 2002 Integrated Report	Justification
		Temperature	Yes	Move to section 4a	TMDL completed
East Fork Creek	ID17010213PN014_02 ID17010213PN014_03	Sediment	Yes	Move to section 4a	Assessment units included in sediment TMDL and load reduction allocation for Lightning Creek
		Temperature	Yes	Move to section 4a	TMDL completed
Rattle Creek	ID17010213PN018_02	Sediment	Yes	Add pollutant to integrated report	Current load above subbasin target; TMDL completed
		Temperature	Yes	Move to section 4a	TMDL completed
Savage Creek	17010213PN015_02	Sediment	Yes	Add pollutant to integrated report	Current load above subbasin target; TMDL completed
		Temperature	Yes	Move to section 4a	TMDL completed
Wellington Creek	ID17010213PN020_02	Sediment	Yes	Add pollutant to integrated report	Previously identified as sediment impaired in 1998, error in 2002 report did not reflect sediment impairment; Current load above subbasin target; TMDL completed
		Temperature	Yes	Move to section 4a	TMDL completed
Johnson Creek	ID17010213PN002_02 ID17010213PN002_03	Sediment	Yes	Move to section 4a	TMDL completed
		Temperature	Yes	Move to section 4a	TMDL completed
Twin Creek	ID17010213PN004_02 ID17010213PN004_03	Sediment	Yes	Add pollutant to integrated report	Current load above subbasin target; TMDL completed
		Temperature	Yes	Move to section 4a	TMDL completed

* Section 4a of the Integrated Report is “Impaired waters with a completed TMDL”.