2. Subbasin Assessment – Water Quality Concerns and Status DRAFT

This section of the subbasin assessment contains a summary of water quality concerns and water quality status for surface waters in the North Fork Coeur d'Alene River Subbasin. All streams within the subbasin have been divided into assessment units for assessment and management purposes. These assessment units are described below, followed by a summary of their water quality status. All streams within the subbasin are expected to support various beneficial uses of surface water. DEQ identifies these beneficial uses and assigns water quality standards to protect them. Beneficial uses and water quality standards are further described in this section. This is followed by a summary analysis of existing water quality data, identification of data gaps, and conclusions regarding the water quality status of North Fork Coeur d'Alene River streams.

2.1 Water Quality Status of North Fork Coeur d'Alene River Subbasin Assessment Units

The Clean Water Act (CWA) mandates that the chemical, physical and biological integrity of the nation's waters be restored and maintained. In accordance with this mandate, the State of Idaho has adopted water quality standards to protect fish and wildlife while providing for recreation in and on the water, whenever attainable. As required by Section 303(d) of the CWA, the State must identify and prioritize water bodies that do not meet water quality standards and whose beneficial uses are impaired by water quality. These are called "impaired" or "water quality limited" water bodies, and the list is referred to as the "303(d) list." This list is published every two years, and is incorporated in DEQ's Integrated Report. The most recent EPA-approved list of impaired water bodies was DEQ's 2002 Integrated Report. A draft 2008 Integrated Report is pending EPA approval. Waters identified as impaired must be addressed with TMDLs to bring them into compliance with water quality standards and full support of beneficial uses.

Previously, DEQ conducted a subbasin assessment and developed TMDLs to address sediment and metals (cadmium, lead, and zinc) impairments in the subbasin. This document, the *Subbasin Assessment and Total Maximum Daily Loads of the North Fork Coeur d'Alene River* (DEQ 2002), contains earlier summaries of impairments.

About Assessment Units

DEQ divides surface waters into assessment units (AUs) for assessment and management. Each AU receives an identification number (e.g., ID17010301PN003_02) and these are used by DEQ to track and report the status of stream segments and lakes. For streams, AUs are groups of similar streams with similar land use practices, ownership, or land management. Stream order is the main basis for determining AUs; streams with similar stream orders are grouped together or are split when stream order changes.

AUs are a refinement on the Water Body Identification System numbering or coding system. This system is built upon the National Hydrography Dataset (http://nhd.usgs.gov/) at scales of 1:100,000 and 1:250,000. This system assigned Water Body Identification (WBID) numbers, 4-digit numbers to water body segments. Until AUs became utilized, these 4-digit WBIDs were used to track water quality status. The WBIDs of impaired waters were also called Water Quality Limited Segments (WQLS) and the two numbering systems (WBID and WQLS) were interchangeable. DEQ started using AUs in and developed a crosswalk to change between numbering systems (Appendix X).

2002 Integrated Report Assessments

There are more than 1,100 stream miles in the North Fork Coeur d'Alene River Subbasin divided into 67 AUs for the 2002 Integrated Report. Forty-three (43) AUs were considered water quality impaired, 6 were considered fully supporting beneficial uses, and 18 were not assessed. Tables X-A to X-G list all impaired AUs by major watershed (5^{th} code HUC) and Table X summarizes the impairments.

Table X. Summary of impairments to waters in the North Fork Coeur d'Alene River Subbasin.

Impairment	Number of Impaired AUs in 2002 Integrated Report
Sediment	29
Temperature	27
Metals	9
Cadmium	4
Lead	1
Zinc	4
Nutrients	2
Unknown	1
Suspended Solids	1
Flow alteration and/or Habitat alteration	9

Sediment impairments were previously addressed by the *Subbasin Assessment and Total Maximum Daily Loads of the North Fork Coeur d'Alene River* (DEQ 2002). These TMDLs assigned sediment load allocations to every major watershed in the subbasin. Currently, DEQ is conducting a Five-Year Review of these sediment TMDLs. That document also established TMDLs for cadmium, lead and zinc in East Fork Eagle Creek. These will be reviewed during assessment of metals impairments in the subbasin and development of appropriate TMDLs. The 2002 Integrated Report identified 27 temperature-impaired AUs. These will be addressed using temperature TMDLs that accompany this subbasin assessment. Impairments for nutrients, unknown pollutants, and

suspended solids were determined to be in error. Flow alteration and habitat alteration, while problematic, are not measurable pollutants and TMDLs will not be developed.

Impaired Waters

A determination of water quality impairment indicates that available data show that conditions or pollutants impair one or more of the stream's beneficial uses. The beneficial uses, water quality criteria, and assessment process are described further in Section 2.2 below. Impairments listed in the 2002 Integrated Report are primarily due to impairments of cold water aquatic life uses.

Table X. Water quality impaired streams in the North Fork Coeur d'Alene River Subbasin identified in the 2002 Integrated Report.

A. Impaired Streams in the Little North Fork Coeur d'Alene River Watershed.

Assessment Unit Name	Assessment Unit	Impairment(s)
Bootjack Creek	ID17010301PN034_02	Temperature
Bumblebee Creek	ID17010301PN031_02	Temperature
Burnt Cabin Creek	ID17010301PN036_02	Sediment, Temperature
Copper Creek, 2nd Order	ID17010301PN039_02	Sediment
Copper Creek, 3rd Order	ID17010301PN039_03	Sediment, Temperature
Deception Creek	ID17010301PN037_02	Temperature
Laverne Creek	ID17010301PN032_02	Temperature
Leiberg Creek	ID17010301PN033_02	Temperature
Little North Fork Coeur d'Alene River - Tributaries	ID17010301PN030_02	Sediment, Temperature, Flow alteration, Habitat alteration
Little North Fork Coeur d'Alene River – 3rd Order	ID17010301PN030_03	Sediment, Flow alteration, Habitat alteration
Little North Fork Coeur d'Alene River – 4th Order	ID17010301PN030_04	Sediment, Flow alteration, Habitat alteration
Skookum Creek, 3rd Order	ID17010301PN038_03	Temperature

B. Impaired Streams in the Lower North Fork Coeur d'Alene River Watershed.

Assessment Unit Name	Assessment Unit	Impairment(s)
Beaver Creek, Upper	ID17010301PN003_02	Metals, Cadmium, Zinc
Beaver Creek, Lower	ID17010301PN003_03	Sediment, Temperature
Cougar Gulch, Tributaries	ID17010301PN029_02	Nutrients, Sediment
Cougar Gulch	ID17010301PN029_03	Nutrients, Sediment
Graham Creek, 3rd Order	ID17010301PN002_03	Temperature
Lower North Fork Coeur d'Alene River	ID17010301PN001_05	Sediment, Suspended Solids, Temperature, Flow alteration, Habitat alteration
Steamboat Creek, 3rd Order	ID17010301PN028_03	Sediment, Temperature, Flow alteration, Habitat alteration

C. Impaired Streams in the Middle North Fork Coeur d'Alene River Watershed.

Assessment Unit Name	Assessment Unit	Impairment(s)
Lost Creek, Upper	ID17010301PN009_02	Sediment
Lost Creek, Lower	ID17010301PN009_03	Sediment, Temperature
North Fork Coeur d'Alene River, Middle, Jordan Cr to Yellow Dog Cr.	ID17010301PN013_05	Sediment
Lower North Fork Coeur d'Alene River	ID17010301PN001_05	Sediment, Suspended solids, Temperature, Flow alteration, Habitat alteration
Yellow Dog Creek	ID17010301PN024_02	Sediment

D. Impaired Streams in the Prichard Creek Watershed.

Assessment Unit Name	Assessment Unit	Impairment(s)
Eagle Creek, West Fork	ID17010301PN008_02	Sediment, Temperature, Metals
Eagle Creek, East Fork	ID17010301PN007_02	Sediment, Cadmium, Zinc, Metals
Eagle Creek, Lower	ID17010301PN007_03	Sediment, Temperature, Cadmium, Zinc, Metals
Prichard Creek, Tributaries	ID17010301PN004_02	Sediment, Metals
Prichard Creek, Butte Creek to Eagle Creek	ID17010301PN004_03	Sediment, Temperature, Metals, Habitat alteration
Prichard Creek, Eagle Creek to North Fork Coeur d'Alene	ID17010301PN004_04	Sediment, Temperature, Metals, Habitat alteration
Prichard Creek, Headwaters and Tributaries	ID17010301PN005_02	Sediment, Temperature, Metals
Prichard Creek, 3rd Order, from Granite Gulch to Butte Creek	ID17010301PN005_03	Sediment, Temperature, Metals, Cadmium, Lead, Zinc

E. Impaired Streams in the Shoshone Creek Watershed.

Assessment Unit Name	Assessment Unit	Impairment(s)
Falls Creek	ID17010301PN011_02	Sediment
Shoshone Creek, Middle	ID17010301PN012_03	Sediment, Unknown
Shoshone Creek, Falls Cr. to North Fork Coeur d'Alene R.	ID17010301PN010_03	Sediment

F. Impaired Streams in the Tepee Creek Watershed.

Assessment Unit Name	Assessment Unit	Impairment(s)
Independence Creek, Upper	ID17010301PN018_02	Temperature
Independence Creek, Lower	ID17010301PN018_03	Temperature
Trail Creek	ID17010301PN019_03	Temperature
Tepee Creek, Lower	ID17010301PN017_05	Temperature
Tepee Creek, Upper, Headwaters and Tributaries (includes Big Elk Creek)	ID17010301PN020_02	Sediment, Habitat alteration
Tepee Creek, Upper, Short Cr to Trail Cr	ID17010301PN020_03	Sediment, Temperature, Habitat alteration

G. Impaired Streams in the Upper North Fork Coeur d'Alene River Watershed.

Assessment Unit Name	Assessment Unit	Impairment(s)
Upper North Fork Coeur d'Alene River, Headwaters	ID17010301PN015_02	Temperature
Upper North Fork Coeur d'Alene River, 3rd order	ID17010301PN015_03	Temperature
Upper North Fork Coeur d'Alene River, Jordan Cr to Tepee Cr	ID17010301PN013_04	Sediment

Full Support Waters

There are six AUs in the subbasin that fully support all beneficial uses according to Idaho water quality standards (Table X). These are identified in three of the seven major watersheds. It is possible that additional streams, not assessed by 2002, will be identified as fully supporting beneficial uses. Additionally, we expect streams previously identified as impaired will be returned to full support through the implementation of TMDLs.

Table X. Streams fully supporting all beneficial uses as identified in the 2002 Integrated Report.

Major Watershed	Assessment Unit Name	Assessment Unit
Middle North Fork Coeur d'Alene River	Downey Creek	ID17010301PN025_03
	Flat Creek	ID17010301PN023_03
	Middle North Fork Coeur d'Alene River, tributaries incl. Big Hank Cr	ID17010301PN013_02
Shoshone Creek	Shoshone Creek, Headwaters	ID17010301PN012_02
Upper North Fork Coeur d'Alene River	Jordan Creek, Tributaries	ID17010301PN014_02
	Jordan Creek and Lost Fork, 3rd Order	ID17010301PN014_03
	Upper North Fork Coeur d'Alene River, tributaries	ID17010301PN013_02

Not Assessed Waters

There were 18 AUs considered not assessed in the 2002 Integrated Report. Since that time, most of these AUs have been evaluated using newly available data and DEQ water body assessment protocols. Changes in assessment status will be reported in this document and included in upcoming Integrated Reports.

Table X. Streams identified as Not Assessed in the 2002 Integrated Report.

Major Watershed	Assessment Unit Name	Assessment Unit
Little North Fork Coeur d'Alene River	Iron Creek	ID17010301PN035_02
	Skookum Creek, 2nd Order	ID17010301PN038_02
Lower North Fork Coeur d'Alene River	Brown Creek	ID17010301PN026_02
	Graham Creek, 2nd Order	ID17010301PN002_02
	Grizzly Creek, 3rd Order	ID17010301PN027_03
	Lower North Fork Coeur d'Alene River, tributaries	ID17010301PN001_02
	Steamboat Creek, 2nd Order	ID17010301PN028_02
Middle North Fork Coeur d'Alene River	Brett Creek	ID17010301PN021_02
	Downey Creek, Headwaters	ID17010301PN025_02
	Flat Creek, Headwaters and Tributaries	ID17010301PN023_02
	Middle North Fork Coeur d'Alene River, tributaries	ID17010301PN001_02
	Miners Creek	ID17010301PN022_02
Prichard Creek	Butte Gulch	ID17010301PN006_02
Shoshone Creek	Shoshone Creek, Tributaries	ID17010301PN010_02
Tepee Creek	Trail Creek, Headwaters	ID17010301PN019_02
	Tepee Creek, Trail Cr to Independence Cr	ID17010301PN017_04
	Tepee Creek, Tributaries below Trail Cr	ID17010301PN017_02
Upper North Fork Coeur d'Alene River	Cataract Creek and West Elk Creek	ID17010301PN016_02
	Upper North Fork Coeur d'Alene River, Spruce Cr to Jordan Cr	ID17010301PN015_04

2.2 Applicable Water Quality Standards

Beneficial uses and water quality standards for water bodies in the North Fork Coeur d'Alene River Subbasin are discussed below. Beneficial uses are described and Tables X and X illustrate their application to subbasin waters. This section of the subbasin assessment also discusses relevant water quality standards and water body assessments.

Beneficial Uses

Idaho water quality standards require that surface waters of the state be protected for beneficial uses, wherever attainable (IDAPA 58.01.02.050.02). These beneficial uses fulfill CWA goals for "swimmable and fishable waters" and may be categorized as existing uses, designated uses, and presumed uses, as described in the following paragraphs. Refer to Idaho water quality standards and Section 3 of the *Waterbody Assessment Guidance, Second Edition* (Grafe et al. 2002) for additional detail regarding the identification of beneficial uses.

Beneficial uses for waters in the North Fork Coeur d'Alene River Subbasin include cold water aquatic life, salmonid spawning, primary contact recreation, secondary contact recreation, domestic water supply, special resource waters, agricultural water supply, industrial water supply, wildlife habitats, and aesthetics (Table X).

Table X. Selected beneficial uses defined.

Beneficial Use	Definition
Cold Water Aquatic Life	Water quality appropriate for the protection and maintenance of a viable aquatic life community for cold water species.
Salmonid Spawning	Waters which provide or could provide a habitat for active self-propagating populations of salmonid fishes.
Primary Contact Recreation	Water quality appropriate for prolonged and intimate contact by humans or for recreational activities when the ingestion of small quantities of water is likely to occur. Such activities include, but are not restricted to, those used for swimming, water skiing, or skin diving.
Secondary Contact Recreation	Water quality appropriate for recreational uses on or about the water and which are not included in the primary contact category. These activities may include fishing, boating, wading, infrequent swimming, and other activities where ingestion of raw water is not likely to occur.
Domestic Water Supply	Water quality appropriate for drinking water supplies.
Special Resource Water	Those specific segments or bodies of water which are recognized as needing intensive protection to: preserve outstanding or unique characteristics; or to maintain current beneficial use.
Agricultural Water Supply	Water quality appropriate for the irrigation of crops or as drinking water for livestock.
Industrial Water Supply	Water quality appropriate for industrial water supplies.
Wildlife Habitats	Water quality appropriate for wildlife habitats.
Aesthetics	Water quality appropriate for aesthetics.

Existing Uses

Existing uses are those beneficial uses actually attained in waters on or after November 28, 1975, whether or not they are designated in the Idaho water quality standards. Existing uses and the level of water quality necessary to protect those uses shall be maintained and protected (IDAPA 58.01.02.050.02, .02.051.01, and .02.053). Existing uses include uses that occur now or have occurred since November 28, 1975, even if current water quality does not fully support that use. For example, salmonid spawning may be considered an existing use for a stream if the stream supported salmonid spawning in the 1980s, but where salmonid spawning no longer occurs due to water quality factors or migration barriers.

Designated Uses

Designated uses are those beneficial uses assigned in the Idaho water quality standards, whether or not the uses are being attained. These designated uses have been specifically identified by the Idaho legislature. In Idaho these include uses such as aquatic life support, recreation in and on the water, domestic water supply, and agricultural uses. Water quality must be sufficiently maintained to protect the most sensitive use. Designated uses may be added or removed following state law procedures, but the effect must not be to preclude protection of an existing use requiring higher water quality, such as cold water aquatic life or salmonid spawning.

Presumed Uses

There are many Idaho waters whose beneficial uses are not specifically identified in the Idaho water quality standards (IDAPA 58.01.02, Sections 110 through 160). Surface waters not designated in Sections 110 through 160 shall be designated according to Section 39-3604, Idaho Code, taking into consideration the use of the surface water and such physical, geological, chemical, and biological measures as may affect the surface water. Prior to designation, undesignated waters shall be protected for beneficial uses, which includes all recreational use in and on the water and the protection and propagation of fish, shellfish, and wildlife, wherever attainable (IDAPA 58.01.02.101.01). Until the beneficial uses are designated by the State, and absent information on existing uses, DEQ presumes that most waters in the state will support cold water aquatic life and either primary or secondary contact recreation (IDAPA 58.01.02.101.01).

Beneficial Uses in the North Fork Coeur d'Alene River Subbasin

Beneficial uses for waters in the North Fork Coeur d'Alene River include cold water aquatic life, salmonid spawning, primary contact recreation, secondary contact recreation, domestic water supply, special resource waters, agricultural water supply, industrial water supply, wildlife habitats, and aesthetics (Table X). Waters with beneficial uses specifically identified in the water quality standards sections 110 through 160 are also listed separately in Table X. Presumed uses for all waters include cold water aquatic life and either primary or secondary contact recreation. Existing uses applied in the North Fork Coeur d'Alene River Subbasin include salmonid spawning for all stream segments. Existing uses include uses that occur now or have occurred since November 28, 1975, even if current water quality does not fully support that use.

Most beneficial uses are applied to the entire subbasin. These include cold water aquatic life, agricultural water supply, industrial water supply, wildlife habitats, and aesthetics (Figure X). Recreational uses apply to the entire subbasin (Figure X). Primary contact recreation is designated for the entire length of the North Fork Coeur d'Alene River, from its headwaters in the upper North Fork Coeur d'Alene River watershed to the confluence with the South Fork Coeur d'Alene River. Prichard Creek, from its headwaters to the North Fork Coeur d'Alene River, is also designated for primary contact recreation. Secondary contact recreation is presumed for all other surface waters of the subbasin. Domestic water supply applies to the North Fork Coeur d'Alene River and portions of Prichard Creek (Figure X).

The North Fork Coeur d'Alene is also designated a Special Resource Water (Figure X). Special Resource Waters are specific segments or bodies of water which are recognized as needing intensive protection to: preserve outstanding or unique characteristics; or to maintain current beneficial use. Designation as a Special Resource Water by the Idaho legislature recognizes at least one of the following characteristics: the water is of outstanding high quality, exceeding both criteria for primary contact recreation and cold water aquatic life; the water is of unique ecological significance; the water possesses outstanding recreational or aesthetic qualities; intensive protection of the water quality is in paramount interest of the people of Idaho; the water is part of the National Wild and Scenic River System, is within a State or National Park or wildlife refuge and is of prime important to that park or refuge; or intensive protection of the quality of water is necessary to maintain an existing, but jeopardized beneficial use (IDAPA 58.01.02.056). The development of point source discharges of pollution to Special Resource Waters are restricted as specified in WQS Subsection 350.04.

Table X. Waters in the North Fork Coeur d'Alene River Subbasin with beneficial uses designated in Idaho water quality standards (IDAPA 58.01.02, Sections 110 through 160).

Water Body	Assessment Unit(s)	Uses[a]
North Fork Coeur d'Alene River (Yellow Dog Creek to mouth)	ID17010301PN001_05	COLD, SS, PCR, DWS, SRW
Prichard Creek (Butte Creek to mouth)	ID17010301PN004_03 ID17010301PN004_04	COLD, SS, PCR
Prichard Creek (source to Butte Creek)	ID17010301PN005_02 ID17010301PN005_03	COLD, SS, PCR, DWS
North Fork Coeur d'Alene River (Jordan Creek to Yellow Dog Creek)	ID17010301PN013_04 ID17010301PN013_05	COLD, SS, PCR, DWS, SRW
North Fork Coeur d'Alene River (source to Jordan Creek)	ID17010301PN015_02 ID17010301PN015_03 ID17010301PN015_04	COLD, SS, PCR, DWS, SRW

[a] COLD = cold water, SS = salmonid spawning, PCR = primary contact recreation, DWS = domestic water supply, SRW = Special Resource Waters

Table X. Beneficial uses for North Fork Coeur d'Alene River Subbasin waters.

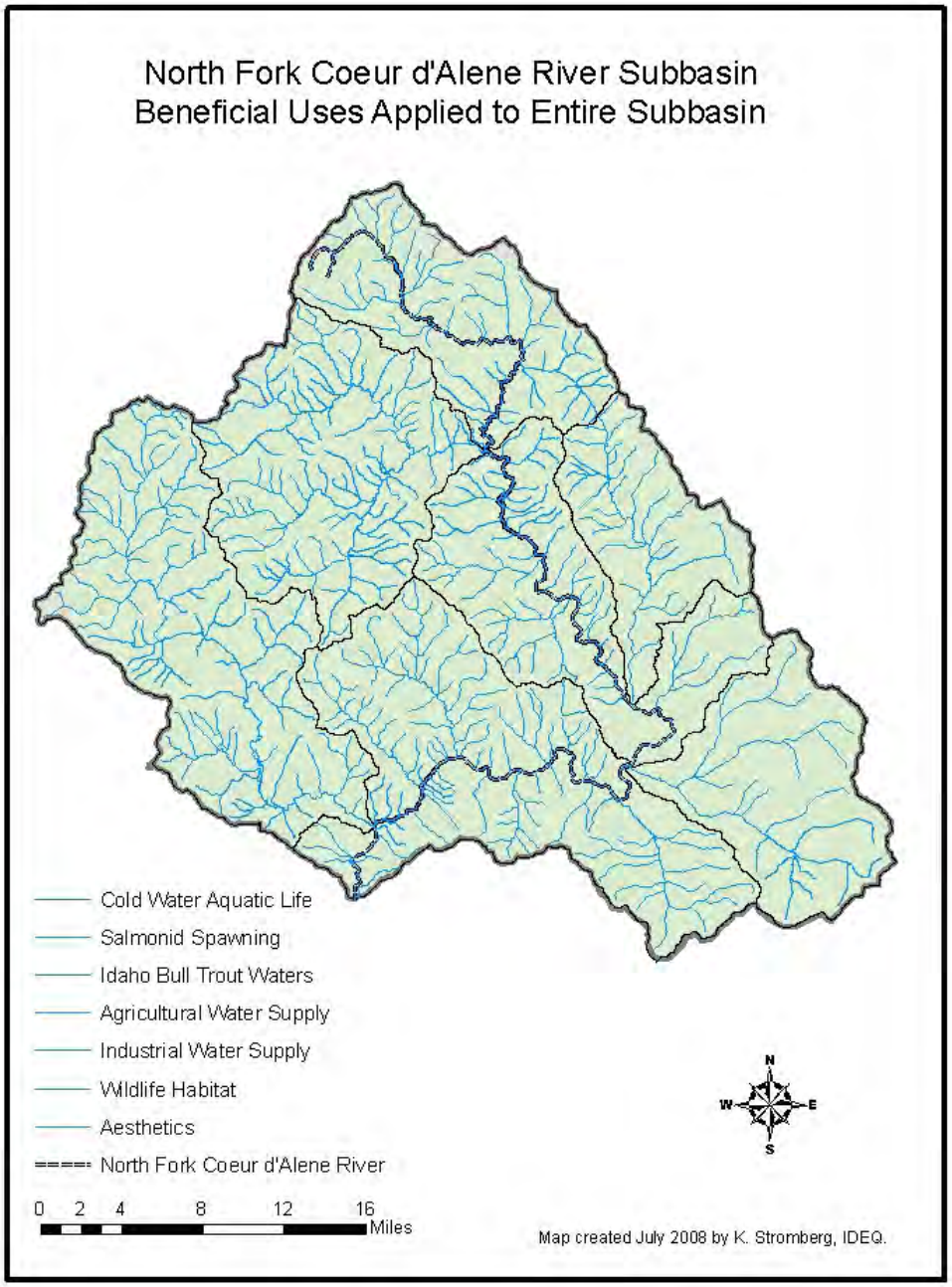
Beneficial Use	Waters		Type
Cold Water Aquatic Life	North Fork Coeur d'Alene River (Yellow Dog Creek to mouth)	ID17010301PN001_05	Designated
	Prichard Creek (Butte Creek to mouth)	ID17010301PN004_03 ID17010301PN004_04	
	Prichard Creek (source to Butte Creek)	ID17010301PN005_02 ID17010301PN005_03	
	North Fork Coeur d'Alene River (Jordan Creek to Yellow Dog Creek)	ID17010301PN013_04 ID17010301PN013_05	
	North Fork Coeur d'Alene River (source to Jordan Creek)	ID17010301PN015_02 ID17010301PN015_03 ID17010301PN015_04	
	All additional streams and assessment units.		Presumed
Salmonid Spawning	North Fork Coeur d'Alene River (Yellow Dog Creek to mouth)	ID17010301PN001_05	Designated
	Prichard Creek (Butte Creek to mouth)	ID17010301PN004_03 ID17010301PN004_04	
	Prichard Creek (source to Butte Creek)	ID17010301PN005_02 ID17010301PN005_03	
	North Fork Coeur d'Alene River (Jordan Creek to Yellow Dog Creek)	ID17010301PN013_04 ID17010301PN013_05	
	North Fork Coeur d'Alene River (source to Jordan Creek)	ID17010301PN015_02 ID17010301PN015_03 ID17010301PN015_04	
	All additional streams and assessment units.		Existing
Primary Contact Recreation	North Fork Coeur d'Alene River (Yellow Dog Creek to mouth)	ID17010301PN001_05	Designated
	Prichard Creek (Butte Creek to mouth)	ID17010301PN004_03 ID17010301PN004_04	
	Prichard Creek (source to Butte Creek)	ID17010301PN005_02 ID17010301PN005_03	
	North Fork Coeur d'Alene River (Jordan Creek to Yellow Dog Creek)	ID17010301PN013_04 ID17010301PN013_05	
	North Fork Coeur d'Alene River (source to Jordan Creek)	ID17010301PN015_02 ID17010301PN015_03 ID17010301PN015_04	
Secondary Contact Recreation	All additional streams and assessment units not designated for primary contact recreation.		Presumed
Domestic Water Supply	North Fork Coeur d'Alene River (Yellow Dog Creek to mouth)	ID17010301PN001_05	Designated
	Prichard Creek (source to Butte Creek)	ID17010301PN005_02 ID17010301PN005_03	

Beneficial Use	Waters		Type
	North Fork Coeur d'Alene River (Jordan Creek to Yellow Dog Creek)	ID17010301PN013_04 ID17010301PN013_05	
	North Fork Coeur d'Alene River (source to Jordan Creek)	ID17010301PN015_02 ID17010301PN015_03 ID17010301PN015_04	
Agricultural Water Supply	All subbasin waters and assessment units.		Designated
Industrial Water Supply	All subbasin waters and assessment units.		Designated
Wildlife Habitats	All subbasin waters and assessment units.		Designated
Aesthetics	All subbasin waters and assessment units.		Designated

Table X. Additional identifications for North Fork Coeur d'Alene River Subbasin waters.

Special Resource Waters	North Fork Coeur d'Alene River (Yellow Dog Creek to mouth)	ID17010301PN001_05
	North Fork Coeur d'Alene River (Jordan Creek to Yellow Dog Creek)	ID17010301PN013_04 ID17010301PN013_05
	North Fork Coeur d'Alene River (source to Jordan Creek)	ID17010301PN015_02 ID17010301PN015_03 ID17010301PN015_04
Idaho bull trout key watersheds	All subbasin waters and assessment units.	
EPA-promulgated bull trout waters	Brown Creek	ID17010301PN026_02
	Falls Creek	ID17010301PN011_02
	Graham Creek, 2nd Order	ID17010301PN002_02
	Graham Creek, 3rd Order	ID17010301PN002_03

Figure X. etc.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Beneficial Uses Applied to Entire Subbasin
Cold Water Aquatic Life
Salmonid Spawning
Idaho Bull Trout Waters
Agricultural Water Supply
Industrial Water Supply
Wildlife Habitat
Aesthetics
North Fork Coeur d'Alene River
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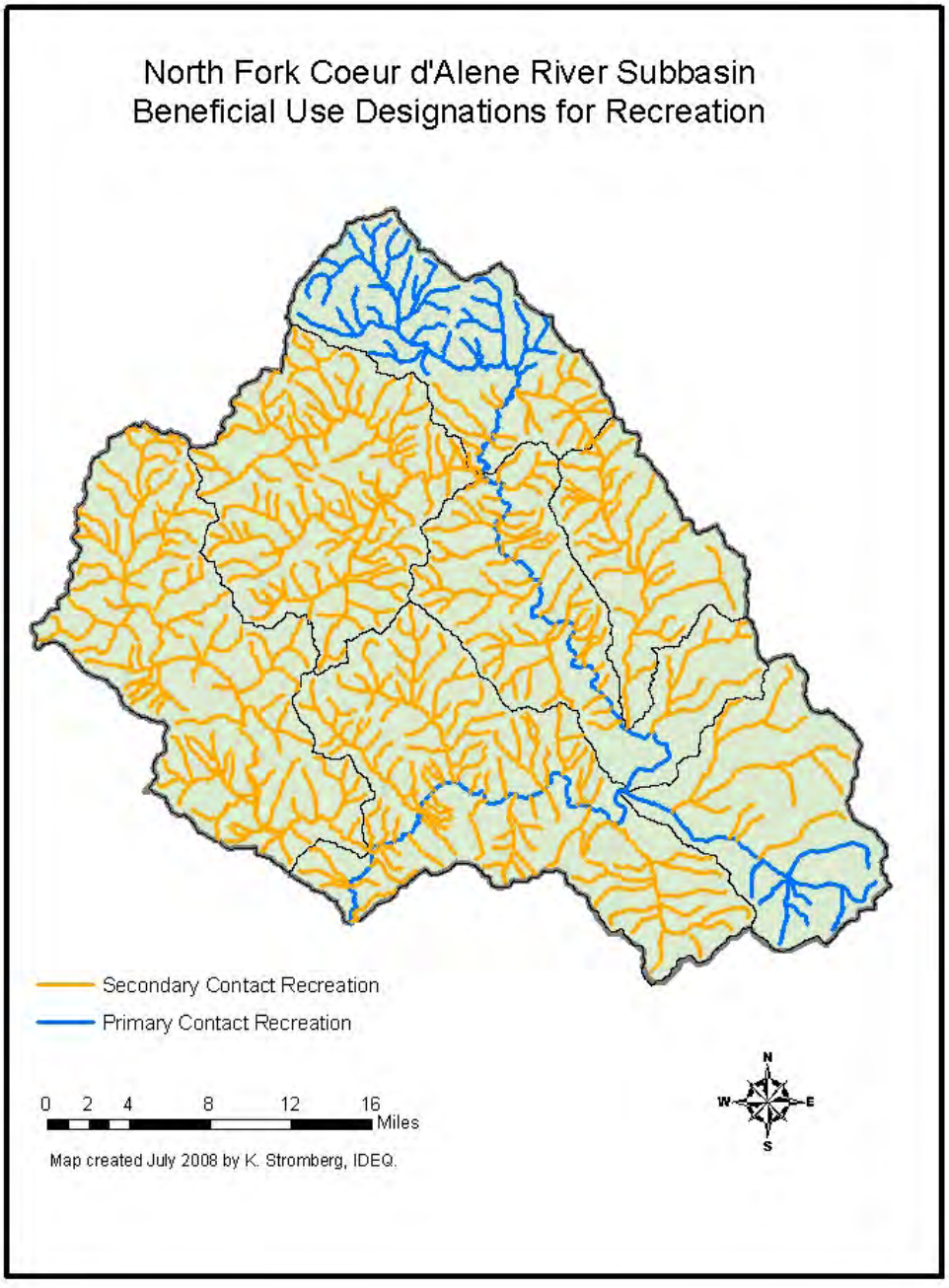
Figure X. etc.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Secondary Contact Recreation
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Figure X. etc.

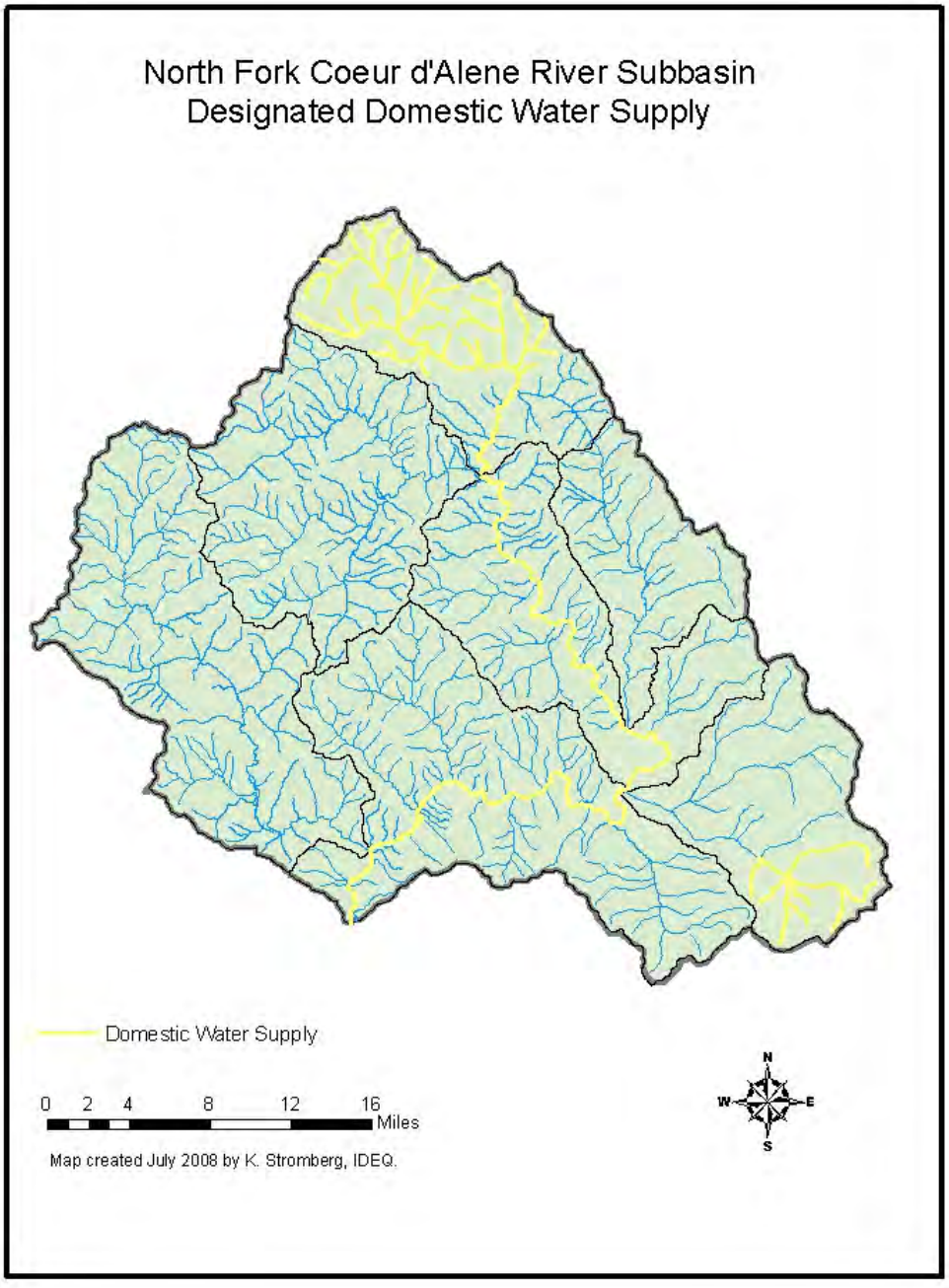
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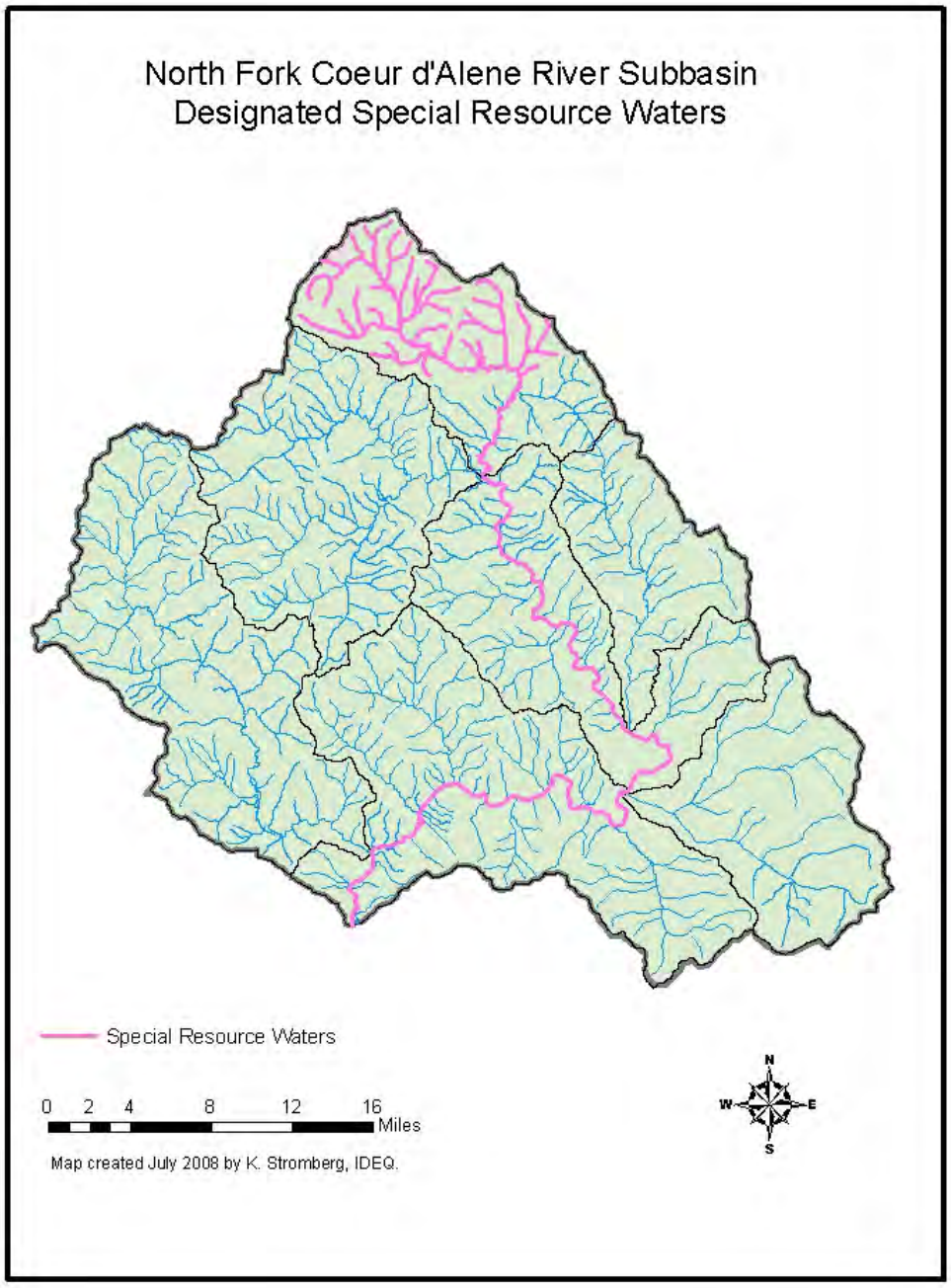
Figure X. etc.


North Fork Coeur d'Alene River Subbasin
Designated Special Resource Waters
Special Resource Waters
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Criteria to Support Beneficial Uses

Beneficial uses are protected by a set of water quality criteria, which include narrative criteria for pollutants such as sediment and nutrients and numeric criteria for parameters such as bacteria, dissolved oxygen, pH, ammonia, temperature, and turbidity. General surface water quality criteria (IDAPA 58.01.02.200) address hazardous, deleterious, toxic, and radioactive materials along with pollutants such as sediment, nutrients, and oxygen-demanding materials (Table X). This portion of the water quality standards also includes a provision for Natural Background Conditions as Criteria.

Table X. Selected general surface water quality criteria (IDAPA 58.01.02.200).

Water Quality Parameter	Description
Toxic Substances	Surface waters of the state shall be free from toxic substances in concentrations that impair designated beneficial uses. These substances do not include suspended sediment produced as a result of nonpoint source activities.
Excess Nutrients	Surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses.
Sediment	Sediment shall not exceed quantities specified in Sections 250 and 252, or, in the absence of specific sediment criteria, quantities which impair designated beneficial uses. Determinations of impairment shall be based on water quality monitoring and surveillance and the information utilized as described in Section 350.
Natural Background Conditions as Criteria	When natural background conditions exceed any applicable water quality criteria set forth in Sections 210, 250, 251, 252, or 253, the applicable water quality criteria shall not apply; instead, there shall be no lowering of water quality from natural background conditions. Provided, however, that temperature may be increased above natural background conditions when allowed under Section 401.

Numeric criteria are established in Idaho water quality standards for pollutants and conditions including metals (e.g., cadmium, copper, lead, nickel, zinc), turbidity, bacteria, pH, dissolved oxygen and temperature. These criteria for toxic substances are described in Section 210 of the Idaho water quality standards. [add more later] Other numeric criteria for protection of beneficial uses are described in Sections 250 to 253 (Table X).

Table X. Selected numeric surface water quality criteria (IDAPA 58.01.02.250 et seq.).

Water Quality Parameter	Use	Criteria
Bacteria	Primary Contact Recreation	Waters must contain less than 126 *E. coli*/100 ml[a] as a geometric mean of five samples over 30 days; no single sample may exceed 406 *E. coli* organisms/100 ml.
	Secondary Contact Recreation	Waters must contain less than 126 *E. coli*/100 ml as a geometric mean of five samples over 30 days; no single sample may exceed 576 *E. coli*/100 ml.
Dissolved Oxygen	Cold Water Aquatic Life	Dissolved oxygen (DO) must exceed 6.0 mg/L[b].
	Salmonid Spawning	Water column DO must exceed 5.0 mg/L or 90% saturation, whichever is greater. Intergravel DO must exceed 5.0 mg/L as a one-day minimum and exceed 6.0 mg/L as a seven-day average.
Turbidity	Cold Water Aquatic Life	Turbidity must not exceed background by more than 50 NTU[c] instantaneously or more than 25 NTU for more than 10 consecutive days.
pH (Hydrogen ion concentration)	Cold Water Aquatic Life	pH values must be within the range of 6.5 to 9.0.

[a] *E. coli*/100 ml = *Escherichia coli* per 100 milliliters
[b] mg/L = milligrams per liter
[c] NTU = Nephelometric turbidity units

There are multiple temperature criteria applicable to waters in the North Fork Coeur d'Alene Subbasin (Table X). In addition to temperature criteria for cold water aquatic life and salmonid spawning, there are criteria specific to protection of bull trout. Idaho water quality standards establish temperature criteria for bull trout in key watersheds (IDAPA 58.01.02.250.g), and there are federal criteria for bull trout protection promulgated by the US EPA (Title 40, Part 131, Subpart D, Section 131.33). Temperature criteria for cold water aquatic life apply throughout the subbasin, while the other criteria apply to specific portions identified below. Bull trout temperature criteria apply to waters identified in Figure X.

Table X. State and federal temperature criteria applicable in the North Fork Coeur d'Alene River Subbasin.

Type	Location	Criteria[a]	Dates	
Cold Water Aquatic Life	Applies to entire subbasin	22 ºC (71.6 ºF) Maximum Instantaneous (MDMT)	Applies entire year	
		19 ºC (66.2 ºF) Maximum Daily Average (MDAT)		
Salmonid Spawning	Applies to North Fork Coeur d'Alene River (headwaters to mouth) and Prichard Creek (headwaters to mouth)	13 ºC (55.4 ºF) Maximum Instantaneous (MDMT)	<u>Spring Spawning</u> >4,000 ft Jun 1 – July 31 3,000 – 4,000 ft May 15 – July 15 <3,000 ft May 1 – July 1	<u>Fall Spawning</u> Aug 15 – Nov 15
		9 ºC (48.2 ºF) Maximum Daily Average (MDAT)		
Idaho Bull Trout Criteria	Applies to entire subbasin except 5th order streams (Tepee Creek below Independence Creek, and North Fork Coeur d'Alene River below Tepee Creek)	13 ºC (55.4 ºF) Maximum Weekly Maximum (MWMT)	<u>Rearing</u> Jun 1 – Aug 31	N/A
		9 ºC (48.2 ºF) Maximum Daily Average (MDAT)	N/A	<u>Spawning</u> Sep 1 – Oct 31
EPA Bull Trout Criteria	Brown Creek, Falls Creek, and Graham Creek	10 ºC (50 ºF) Maximum Weekly Maximum (MWMT)	Jun 1 – Sep 30	

[a]MDMT = Maximum Daily Maximum Temperature; MDAT = Maximum Daily Average Temperature; MWMT = Maximum Weekly Maximum Temperature

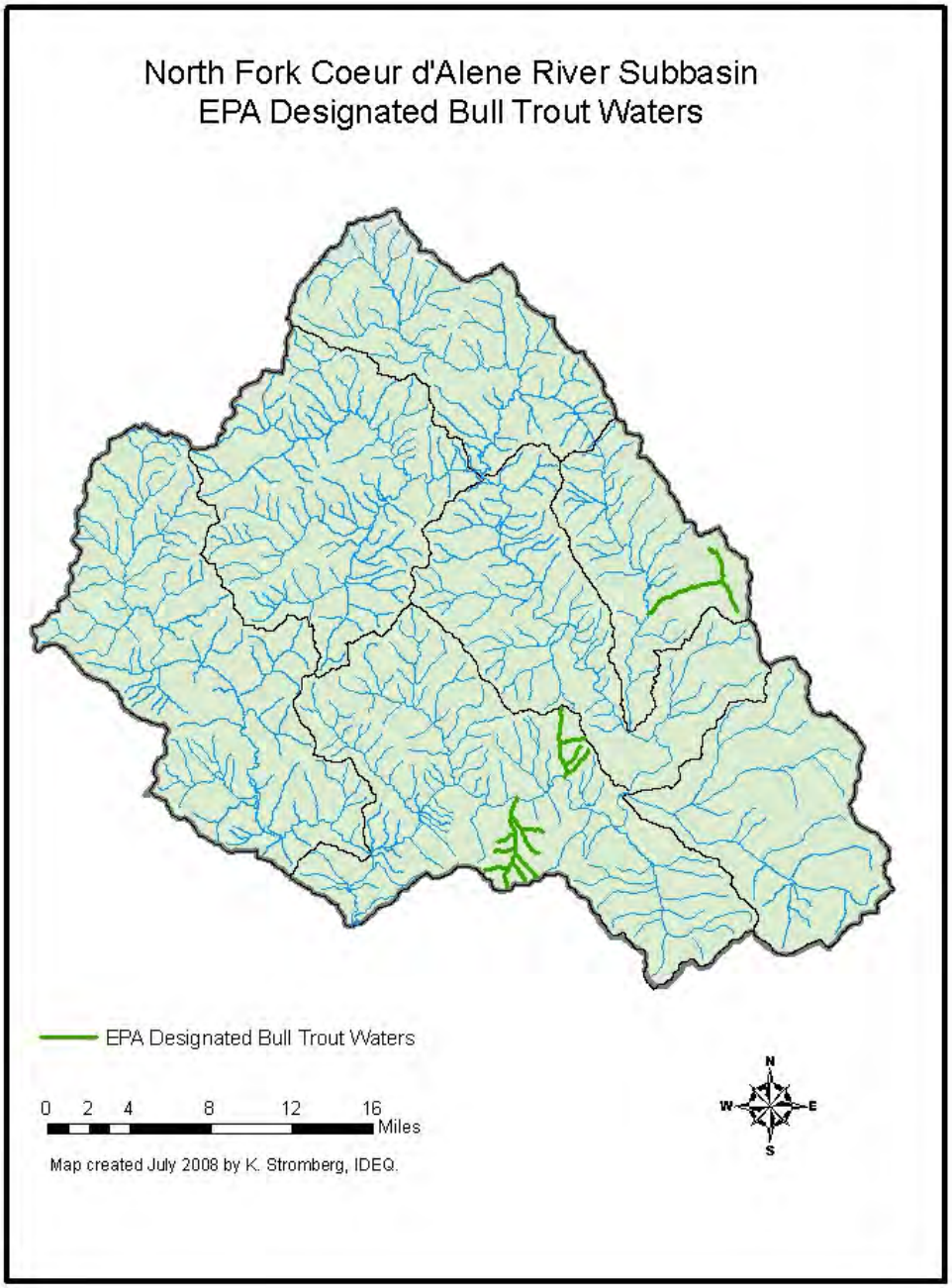

Figure X. need to incorporate ID bull trout waters for overall figure….

Water Body Assessment Procedures

DEQ conducts water body assessments to determine if water quality is supporting beneficial uses of surface waters and whether water quality is exceeding water quality standards. The procedure to determine whether a water body fully supports its beneficial uses is outlined in IDAPA 58.01.02.053. The procedure relies heavily upon biological parameters, and is detailed in the *Water Body Assessment Guidance, Second Edition* (Grafe et al. 2002). This guidance requires use of the most complete data available to make beneficial use support status determinations.

To complete water body assessments, beneficial uses must be determined, applicable water quality criteria must be identified, and data must be compiled and evaluated. For example, Figure X outlines the assessment process for determining the water quality support status for selected beneficial uses (cold water aquatic life, salmonid spawning, and recreation).

Replacement figure?

Figure 1. Determination Steps and Criteria for Determining Support Status of Beneficial Uses in Wadeable Streams: Water Body Assessment Guidance, Second Edition (Grafe *et al*. 2002).

2.3 Impacts of Pollutants on Beneficial Uses

This section of the subbasin assessment describes basic relationships among selected pollutants and beneficial uses of surface waters. This is an introductory summary of these topics and is not intended to serve as a full, technical reference. Most pollutants that impair beneficial uses in the North Fork Coeur d'Alene River Subbasin are naturally occurring stream characteristics that have been altered by humans. For example, fine sediment occurs naturally in streams and is necessary for aquatic life; however, human activities can increase sedimentation to an extent that damages aquatic life. When anthropogenic sources cause pollution above natural background levels and impair the beneficial uses of waters, we must implement TMDLs to restore water quality.

Temperature

Water temperature is an integral factor that determines the type of aquatic life occurring in a water body. Water temperature strongly influences the life cycles of fish and other aquatic species, and different water temperature regimes dictate whether a warm, cool, or coldwater aquatic community is present. Many factors, natural and anthropogenic, affect stream temperatures. Natural factors that affect water temperature include altitude, aspect, climate, riparian vegetation, and channel morphology (e.g. width and depth). Humans influence water temperature through activities including heated discharges (such as those from point sources), alteration to riparian vegetation, stream channel alteration, and flow alteration.

Water temperatures outside the natural background range of variability can be harmful to fish at all life stages, especially if occurring in combination with other stressors like low dissolved oxygen or poor food supply. Fish vary in their tolerance to temperature ranges. Some species may tolerate wide ranges in temperature conditions and can tolerate high water temperatures. Other species survive only in a relatively narrow range of temperature conditions and cannot tolerate high water temperatures. In Idaho, coldwater species like trout and salmon are the least tolerant of high water temperatures.

High water temperatures can be damaging to cold water aquatic life as both a chronic (long-term) and an acute (short-term) stressor. For adult fish, chronic exposure to high water temperatures can result in reduced body weight, reduced oxygen exchange, increased susceptibility to disease, and reduced reproductive capacity. Acute exposure to high water temperatures can result in death if fish are unable to seek refuge in cooler water. Water temperatures can create migration barriers as fish avoid high temperatures. Juvenile fish are even more sensitive to temperature variations than adult fish and can experience negative impacts like lower growth rates at lower temperatures than adversely affect adults. Water temperatures also affect embryonic development of fish and may affect aquatic invertebrates, amphibians and mollusks.

Sediment

Naturally functioning stream systems include many forms of sediment depending on the underlying geology, land use and other factors. Sediment is generally classified by particle size and can range from fine sediments like silt to coarse sediments like cobbles and boulders. Both suspended sediment (small particles floating in the water column) and bedload sediment (large particles moving along the stream bottom) can have negative effects on aquatic life communities. These effects may be acute or chronic, depending on the duration of exposure and watershed conditions. Elevated suspended sediment levels can interfere with feeding behavior (difficulty finding food due to visual impairment), damage gills, reduce growth rates, and, in extreme cases, eventually lead to death.

Newcombe and Jensen (1996) reported the effects of suspended sediment on fish, summarizing 80 published reports on streams and estuaries. For rainbow trout, physiological stress, which includes reduced feeding rate, is evident at suspended sediment concentrations of 50 to 100 mg/L when those concentrations are maintained for 14 to 60 days. Similar effects are observed for other species, although the data sets are less complete. Adverse effects on habitat, especially spawning and rearing habitat presumably from sediment deposition, were noted at similar concentrations of suspended sediment. Organic suspended materials can also settle to the bottom and, due to their high carbon content, lead to low intergravel DO through decomposition.

In addition to these direct effects on the habitat and spawning success of fish, detrimental changes to food sources may occur. Aquatic insects, which serve as a primary food source for many fish, are affected by the amount and types of sediment in a water body. Increased sedimentation leads to a macroinvertebrate community that is adapted to burrowing, thereby making the macroinvertebrates less available to fish. Community structure, specifically diversity, of the aquatic macroinvertebrate community is diminished due to the reduction of coarse substrate habitat.

Settleable solids are defined as the volume or weight of material that settles out of a liter of water in one hour (Franson et al. 1998). Settleable solids may consist of large silt, sand, and organic matter. Total suspended solids (TSS) are defined as the material collected by filtration through a 0.45 µm (micrometer) filter (Standard Methods 1975; 1995). Settleable solids and TSS both contain nutrients that are essential for aquatic plant growth. Settleable solids are not as nutrient rich as the smaller TSS, but they do affect river depth and substrate nutrient availability for macrophytes. In low flow situations, settleable solids can accumulate on a stream bottom, thus decreasing water depth. This increases the area of substrate that is exposed to light, facilitating additional macrophyte growth.

Bacteria

To protect human health during swimming and other recreation, the State of Idaho tests water for the presence of pathogens and applies water quality criteria to limit human exposure to pathogens. Pathogens are a small subset of microorganisms (e.g., certain bacteria, viruses, and protozoa), which, if taken into the body through contaminated water or food, can cause sickness or even death. Some pathogens are also able to cause illness by entering the body through the skin or mucous membranes.

Direct measurement of pathogen levels in surface water is difficult because pathogens usually occur in very low numbers and analysis methods can be unreliable and expensive. A bacterium called *Escherichia coli* (*E. coli*) is used as an "indicator" organism in Idaho water quality standards. Because it can be more easily and accurately detected, the presence of *E. coli* in water samples is used to indicate the presence of other harmful human pathogens. *E. coli* is a type of fecal coliform bacteria that naturally occurs in the digestive system of warmblooded animals, and *E. coli* can enter streams from animals or human sources. It can also be present without causing illness. *E. coli* is often measured in colony forming units (cfu) per 100 ml. The human health effects from pathogenic coliform bacteria range from nausea, vomiting, and diarrhea to acute respiratory illness, meningitis, ulceration of the intestines, and even death. Coliform bacteria do not have a known effect on aquatic life.

Pathogens may enter water from both point and nonpoint sources. Bacteria monitoring is often a monitoring component for point source permits (National Pollution Discharge Elimination System [NPDES] permits), and point sources often provide some level of bacteria-reducing treatment prior to discharge. Nonpoint sources of bacteria can be diffuse and difficult to characterize. Nonpoint sources like stormwater runoff from urban and agricultural areas may also have a great impact on the bacteria concentrations in receiving surface waters.

Metals

Metals can be toxic to aquatic organisms and fish if absorbed into their systems. The uptake of metals by aquatic life is an active, rather than a passive, biological process. Because the primary pathway for most metal uptake by aquatic life is through respiratory organs of fish and aquatic invertebrates, and only ionic forms of metals can pass through cell membranes, the toxicity of most metals to aquatic life is a function of the

concentration of dissolved ionic forms of metals in the stream. Consequently, particulate metals are not directly toxic to most forms of aquatic life. Many toxic substances, including metals, have a tendency to leave the dissolved phase and attach to suspended particulate matter. The fractions of total metal concentration present in the particulate and dissolved phases depend on the partitioning behavior of the metal ion and the concentration of suspended particulate matter. The dissolved fraction may also be affected by complexing of metals with organic binding agents. Idaho water quality standards are based on the bioavailable dissolved forms of metals.

Trace metals, including cadmium and lead, have been demonstrated to be endocrine disrupters in fish. Dill et al (2002) cite a study by Fairchild et al. (1999) that shows endocrine disruptors are believed to disrupt hormone systems in Atlantic salmon affecting smoltification, the physiological process necessary for seawater adaptation.

pH

pH is a measure of the concentration of hydrogen ions in a solution, and it is an important determining factor in water chemistry and ecological processes. pH is measured on a scale of 0 to 14. A pH value of 7.0 is considered neutral while pH less than 7 is acidic and pH greater than 7 is basic or alkaline. Pure water has a pH of 7.0, but natural freshwater systems can vary widely in pH. Extreme pH values are detrimental to most aquatic organisms and Idaho water quality standards require pH values between 6.5 and 9.0 for support of cold water aquatic life.

Acid conditions in surface waters can be due to natural and anthropogenic factors like underlying geology and acid deposition in rainfall. Low pH waters can also be associated with drainage from abandoned mines and other human activities. Effects of low pH include reduced numbers of species and individuals in aquatic communities (Allan 1995). Low pH can increase mobilization of potentially toxic metals, alter food webs, and cause direct physiological effects such as increased mortality, failure of egg development, and behavioral avoidance.

2.4 Summary and Analysis of Existing Water Quality Data

Numerous sources of water quality data were used in this subbasin assessment and TMDLs. DEQ monitoring data, primarily BURP, were used as the baseline information. Other data were obtained from multiple federal, state and local entities. Reports from the Watershed Professionals Network present many helpful compilations and analyses of water quality data in the subbasin. This section of the assessment contains a brief summary of water quality and related data. Additional detail may be found in the appendices and references.