

STATEWIDE TMDL ADVISORY GROUP (STAG) MEETING SUMMARY

JANUARY 29, 2020

Skype Meeting
1:30 to 3:30 p.m.

Attendance:

STAG Members (name, affiliation, interest group represented)

John Youngberg, Montana Farm Bureau – Farming-Oriented Agriculture (STAG Chair)
Brian Sugden, Weyerhaeuser Company - Forestry Industry
Ryan Leland, City of Helena - Municipalities
Doug Parker, Hydrometrics - Mining
Alden Shallcross, Bureau of Land Management – Federal Land Management Agencies
Jeff Schmalenberg, MT Dept. of Natural Resources and Conservation – State Trust Land Management Agencies
Jordan Tollefson, Northwestern Energy – Hydroelectric Industry
Mike Geary, Healing Waters Lodge – Fishing-Related Business

Other Participants & Affiliation

Derf Johnson, Montana Environmental Information Center (MEIC)
Terri Nichols, Montana Watershed Coordination Council
Jon Kenning, DEQ/Bureau Chief – Water Protection Bureau
Galen Steffens, DEQ/Bureau Chief – Water Quality Planning Bureau
Darrin Kron, DEQ/Supervisor – Monitoring and Assessment
Kristy Fortman, DEQ/Supervisor - Watershed Protection Section
Christy Meredith, DEQ/Watershed Protection Section
Christina Staten, DEQ/Watershed Protection Section
Robert Ray, DEQ/Watershed Protection Section
Mark Ockey, DEQ/Watershed Protection Section
Eric Trum, DEQ/Watershed Protection Section
Hannah Riedl, DEQ/Watershed Protection Section
Lou Volpe, DEQ/Watershed Protection Section
Chace Bell, DEQ/Water Quality Monitoring and Assessment Section
Katie Makarowski, DEQ/Water Quality Monitoring and Assessment Section

John Youngberg, STAG Chair, called the meeting to order at 1:40 p.m. and there was a round of introductions of those in attendance via Skype and in room 111 of the DEQ Metcalf Building in Helena.

WATER QUALITY ASSESSMENT METHODS

Darrin Kron, Supervisor of the Monitoring and Assessment Section of DEQ, and Katie Makarowski of the Monitoring and Assessment Section provided an overview of DEQ's water quality planning process, the goals of the water quality monitoring and assessment program, the impairment listing and beneficial use assessment process, and how this information relates to the STAG's role as defined in state law (Montana Code) (see Attachment A for a copy of their presentation). Katie then provided an overview of Montana's *E. coli* water quality standards and draft assessment method (Attachment A). Chace Bell of the Monitoring Assessment Section provided an overview of Montana's electrical conductivity (EC) and sodium adsorption ratio (SAR) water quality standards for Rosebud Creek, the Tongue, Powder, and Little Powder rivers, and the Tongue River Reservoir, and the draft assessment method for EC and SAR (Attachment A). Darrin closed this presentation with an overview of the state's water quality integrated report and the public comment process for the report and draft assessment methods.

The draft 2020 Water Quality Integrated Report, the draft *Escherichia coli* (*E. coli*) Assessment Method for State Surface Waters, and the draft Electrical Conductivity (EC) and Sodium Adsorption Ratio (SAR) Assessment Method for Rosebud Creek, Tongue, Powder Rivers, and Tongue River Reservoir will be available for a 60-day public comment period, anticipated to begin in early February. DEQ will begin working on updated assessment methods for sediment, metals, and possibly toxins and PCBs, and intends to have these documents ready for public comment by the time of the 2022 integrated report.

Discussion:

Brian Sugden, Timber Industry representative, asked why impairment by only EC or SAR is required to list a waterbody, but attainment of both EC and SAR water quality standards are required to delist a waterbody. Darrin Kron responded that DEQ will follow-up on this question, as the assessment method is still draft, and a determination on these impairment listing/delisting decision factors is not final.

February 2020 DEQ Response: After an evaluation of the assessment process and of each parameter's impacts to the agriculture beneficial use, both parameters are needed to fully assess agriculture uses, but both parameters are not required to delist an assessment unit for EC or SAR.

Doug Parker, Mining representative, asked how DEQ deals with public comment on waterbody listings and delistings reported for the current assessment cycle in the 2020 Water Quality Integrated Report. Darrin Kron responded that DEQ considers each substantive comment and whether the comment may affect the outcome of the impairment listing decision (i.e., list, keep listed, do not list, or delist). DEQ prioritizes comments that affect the decision and may postpone administrative work related to comments that do not affect the listing decision; postponed work may be addressed in the next assessment cycle/integrated report (in this instance, would be the 2022 assessment cycle and report). However, DEQ will try to address all comments during the current cycle, if resources are available to do so.

John Youngberg, Farming-Oriented Agriculture representative, asked how DEQ reports back to the public on the comments received and DEQ's actions in response to those comments. Darrin Kron responded that the final 2020 Water Quality Integrated Report will contain an appendix that summarizes all comments and DEQ's responses to those comments.

Brian Sugden asked what is DEQ’s mechanism for getting public or stakeholder feedback on the next assessment method updates prior to their public comment period, as waiting until public comment seems to be too late in the process. Darrin Kron responded that ideally DEQ should think about having a public comment period prior to public comment on the draft integrated report, and have done this in the past. However, DEQ did not have the resources to do so for the current assessment methods that will be available for public comment with the draft 2020 integrated report (i.e., *E. coli* and EC/SAR). Brain suggested for the sediment assessment method, if DEQ already knows what types of changes will be made to the method and if there’s an opportunity to involve stakeholders early on, to collect their input prior to conducting assessments with the new method. Darrin Kron responded that if DEQ can do this time-wise, that the agency should consider it for all future assessment method updates and for development of new assessment methods.

MONITORING, TMDL, AND NONPOINT SOURCE PROGRAM UPDATES

See Attachment B for a copy of the presentation containing maps associated with these program updates.

Monitoring & Assessment Projects for 2020

Darrin Kron showed a map of, and discussed, the Monitoring and Assessment Section’s proposed priority areas for monitoring and assessment in 2020 (see summary table below), noting that DEQ is still determining whether it has enough resources to conduct all the projects shown. Projects are chosen based on internal outreach within DEQ to solicit different projects across programs and then decisions are made as a management team, as well as soliciting feedback from the STAG, and other agency partners.

Project Type	Project	Nutrients	Metals	Sediment	Selenium	Turbidity
New TMDL Support Area (previously chosen with STAG consultation)	Yellowstone River mainstem Collected data in 2019; have enough data to conduct assessments on all segments of the river. Contemplating monitoring less sites this year - only at sentinel sites to track trends over time; also looking to make this a collaborative project if local partnerships can be made to collect data, with DEQ funding laboratory analysis.	X	X			
	Missouri River mainstem (Three Forks/headwaters to Marias River) Need to continue monitoring to collect sufficient data to conduct assessments. May expand sites this year for source assessment purposes.	X	X			

Project Type	Project	Nutrients	Metals	Sediment	Selenium	Turbidity
	<p>Smith River Collected data last year and will again this year. Trying to determine detailed causes of elevated nutrient levels and water temperature; there is a potential for nutrient TMDL development for the mainstem</p>	X				
	<p>Middle Fork Judith River Proposed monitoring in response to a request from the USFS and Trout Unlimited for a sediment assessment. USFS and TU have conducted a NEPA analysis and have plans to reduce road crossings. An impairment determination is needed before 319 funding could be used.</p>			X		
Monitoring Threats to Water Quality	<p>Upper Gallatin Coordinating with the Gallatin River Task Force to look at nutrients for two years in response to a large algae bloom. TMDLs have already been completed for this area and DEQ is providing both technical and funding support.</p>	X				
	<p>Lake Koocanusa A partnership with various agencies to track selenium trends; DEQ's Water Quality Standards section is developing updated standards for selenium.</p>	X			X	
Monitoring for Success Stories (Delistings) & Trends	<p>Clark Fork River Ongoing project for over 20 years that is being continued through partnerships</p>	X				
	<p>Various Tributaries in Western Montana Contemplating monitoring for sediment success stories (removals from impaired waters list)</p>			X		
	<p>Nevada Creek Considering monitoring for nutrient trends, in response to three 319 restoration projects</p>	X				
Monitoring in Nonpoint Source Focus Areas	<p>Bitterroot River Watershed May conduct sediment monitoring to find success stories and also monitor the mainstem for nutrient trends</p>	X		X		
	<p>Lower Gallatin River Watershed Proposing nutrient monitoring</p>	X				
Supporting Other Projects	<p>Various Volunteer Monitoring Programs DEQ funds projects across the state that are in support of the Monitoring & Assessment Section's overall monitoring objectives</p>	X	X			

Project Type	Project	Nutrients	Metals	Sediment	Selenium	Turbidity
	Lake Mary Ronan Two years of funding for volunteer monitoring	X				
	Big Horn River DEQ is serving on a technical advisory committee for study of nutrients, selenium, & turbidity	Providing technical support				
	Red Rock Lake FWP's "Save the Graying in Red Rock Lake" aeration project	Loaning monitoring equipment				

TMDL Development Status

Kristy Fortman, Supervisor of the Watershed Protection Section, discussed the status of TMDL development in TMDL priority areas where: TMDL work is in progress, pre-TMDL assessment has been initiated, and TMDL development is planned post 2022 (see table below). All in-progress TMDL work, plus the Yellowstone River, are included as commitments to EPA for completion by the end of 2022.

TMDL Phase	Project	Status	2022 Commitment to EPA
TMDLs in Progress	Sheep Creek Aluminum	Currently out for stakeholder review	X
	Madison Temperature & Sediment	Stakeholder review projected for Spring 2020	X
	Beaverhead Nutrients & Metals	Stakeholder review projected for Spring/Summer 2020	X
	Musselshell Nutrients & <i>E. coli</i>	In data analysis and source assessment phase	X
	Red Rock Nutrients, Metals, <i>E. coli</i> , & Sediment	Source assessment data has been collected, reviewed for quality assurance, and input into database	X
	Tongue River Salinity	Waiting for completed modeling report	X
Pre-TMDL Assessment Initiated	Yellowstone River Nutrients	In monitoring and assessment phase	X
	Smith River Watershed Nutrients	In monitoring and assessment phase	
	Missouri River Nutrients (Headwaters to Marias River)	In monitoring and assessment phase	
TMDL Development Starting Post 2022	Flathead Lake Phase II	Waiting for development of nutrient water quality standards for the lake	
	Otter Creek	Initiated due to a new, proposed coal mine; on hold due to inactivity of mine development	

Nonpoint Source Program Updates

Kristy Fortman showed a map of areas with completed watershed restoration plans (WRPs), noting that updates to the Bitterroot and Lower Clark Fork WRPs were accepted by DEQ in 2019. Additionally, a map of current nonpoint source focus areas was shown, highlighting the Bitterroot River watershed as the current focus area and the Lower Gallatin designated as the next focus area. Eric Trum, of the Watershed Protection Section, discussed the selection criteria for focus watersheds.

Discussion

Doug Parker asked how much of the proposed 2020 monitoring is unrelated to TMDL development and why it is not focused on TMDLs. Darrin Kron responded that approximately 40% of the monitoring is not directly related to TMDL development; however, the priorities are linked to the Section's new 20-year strategic plan and program objectives (see summary of the January 2019 STAG meeting). Some of the monitoring priorities are to find success stories of waterbodies that can be delisted due to restoration activities in the watershed, and others are to support monitoring requests made by other agencies and organizations. DEQ is working to show that partnerships with local organizations, to get nonpoint source 319 funding in place in these areas to fund restoration projects, is leading to successes of removing waterbodies from the impaired waters list.

Doug Parker commented that it seems like a major shift in policy to choose focus watersheds and prioritize a portion of 319 funding for the focus watershed, and asked if stakeholders were involved in this policy decision. Kristy Fortman responded that the draft 20-year strategic plans for monitoring and assessment, TMDL development, and nonpoint source priorities were released for public comment in 2019 and DEQ also held meetings with agency and partner organizations to solicit feedback on the plans. Eric Trum noted that 319 funding requests doubled in 2019, largely in part to having initiated a focus watershed in the Bitterroot, as nearly half of the requests originated from the Bitterroot River watershed alone.

DISCUSSION OF POSSIBLE JOINT STAG AND WPCAC MEETINGS

The possibility of joint meetings with the Water Pollution Control Advisory Council (WPCAC) was discussed. Kristy Fortman provided an overview of the differing roles of both STAG and WPCAC and requested thoughts from the group. It was decided that the STAG would like to receive the agendas for the WPCAC meetings to determine if they are interested in attending; however, the STAG would not like to move forward with joint meetings at this time.

Discussion

Doug Parker asked if there is a benefit to DEQ to have joint meetings of the two groups. Jon Kenning, Bureau Chief of DEQ's Water Protection Bureau, and Kristy Fortman responded that the benefit would be for each group to be informed of what the other does and is discussing. Jon Kenning noted that one topic WPCAC regularly addresses is discharge permits, and discharges permits are a component of some TMDLs via wasteload allocations.

John Youngberg stated that he wasn't sure he would be interested in attending WPCAC meetings, but at a minimum the two groups should share meeting agendas. Jordan Tollefson, Hydroelectric Industry representative, stated that he sees no disadvantage of having shared agendas, but thinks it would be too much to have concurrent meetings. Jordan said he isn't sure how much overlap there would be between the two groups and isn't sure he would participate in the WPCAC meetings.

PLANNING FOR NEXT STAG MEETING

John Youngberg stated he would like the next meeting to be in person and suggested a Doodle Poll be sent out to find a date and time in April.

PUBLIC COMMENT

There was no public comment.

The meeting was closed at 3:30 p.m.

ATTACHMENT A: ASSESSMENT METHODS PRESENTATION



Water Quality Assessment:

Overview and Updates

Presentation to the Statewide TMDL
Advisory Group (STAG)
January 2020
Darrin Kron, Katie Makarowski, Chace Bell

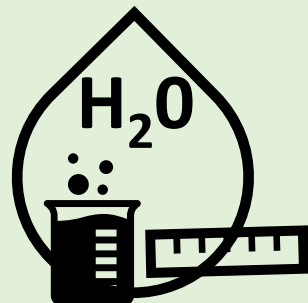
Introduction: Monitoring and Assessment

Darrin Kron



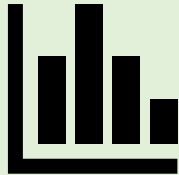
DEQ's Water Quality Planning Process

1
Monitor Water Quality



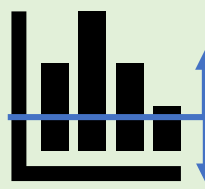
Collect data about water quality

2
Characterize Water Quality



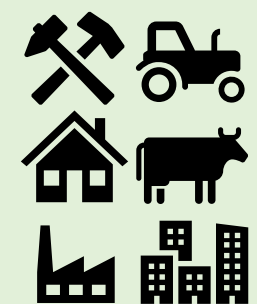
Describe and compare water quality conditions across the project area

3
Assess Water Quality




Determine whether waters are "impaired" (fail to meet one or more water quality standards and do not fully support beneficial uses)

4
Identify Sources of Pollution




Estimate amount of pollution from identified sources

5
Develop Total Maximum Daily Loads (TMDLs)



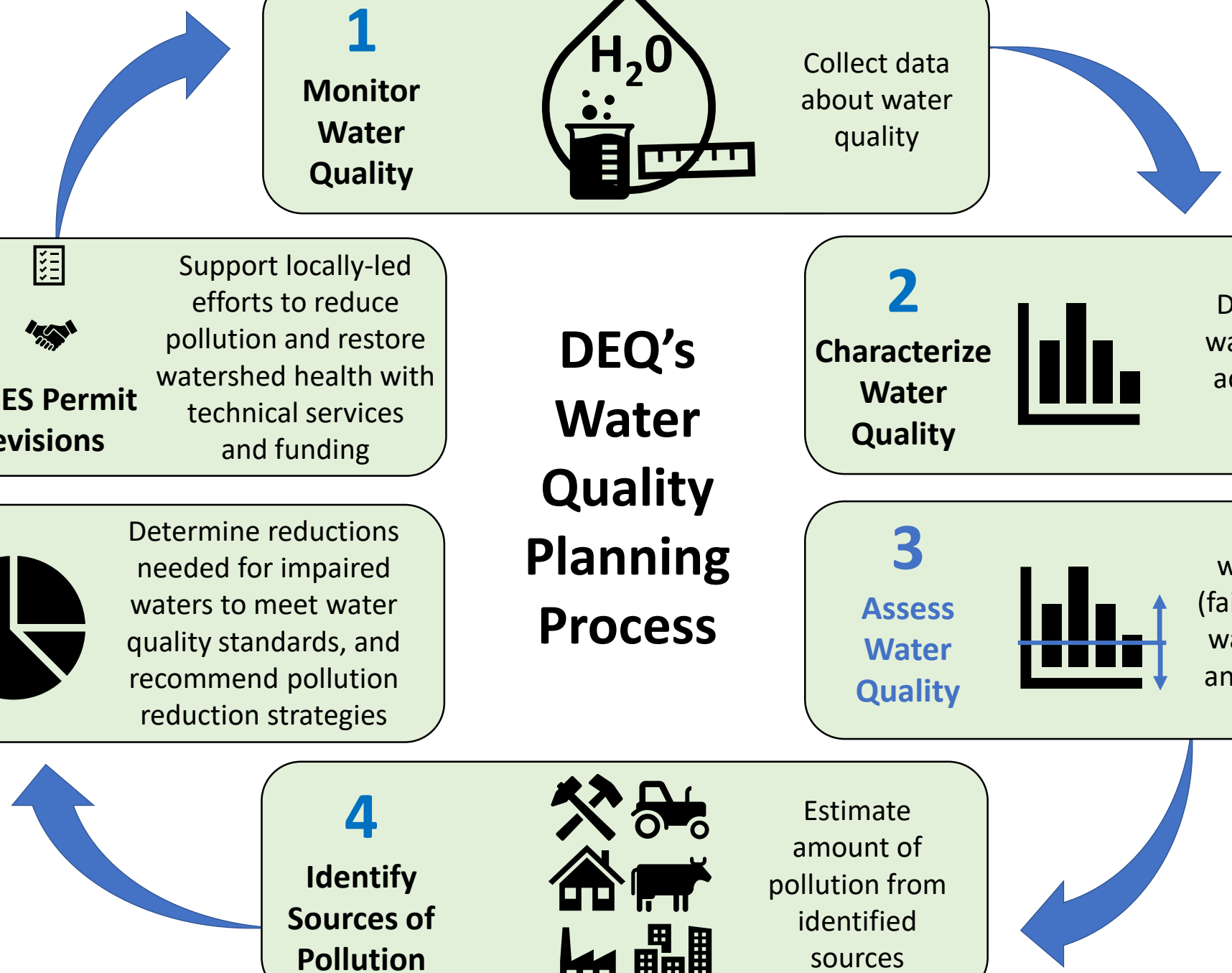
Determine reductions needed for impaired waters to meet water quality standards, and recommend pollution reduction strategies

6
Support Watershed Restoration



Support locally-led efforts to reduce pollution and restore watershed health with technical services and funding

NPDES Permit Revisions



Statewide TMDL Advisory Group (STAG) Related Law

https://leg.mt.gov/bills/mca/title_0750/chapter_0050/part_0070/section_0020/0750-0050-0070-0020.html

https://leg.mt.gov/bills/mca/title_0750/chapter_0050/part_0070/section_0040/0750-0050-0070-0040.html



Water Quality Monitoring and Assessment Section

Objective 1: Inform, engage and support people working to protect and improve water quality

- Promote monitoring partnerships and volunteer monitoring, report to stakeholders more clearly, improve data sharing

Objective 2: Describe current water quality conditions

- Assess water quality and beneficial use support
- Spatial comparisons of water quality
- Investigate emerging water quality problems
- Establish baseline and reference conditions to enable future comparisons



Water Quality Monitoring and Assessment Section

Objective 3: Track water quality change over time

- Document water quality improvements in focus watersheds
- Document water quality improvements where partners implement substantial improvements
- Monitor long-term trends

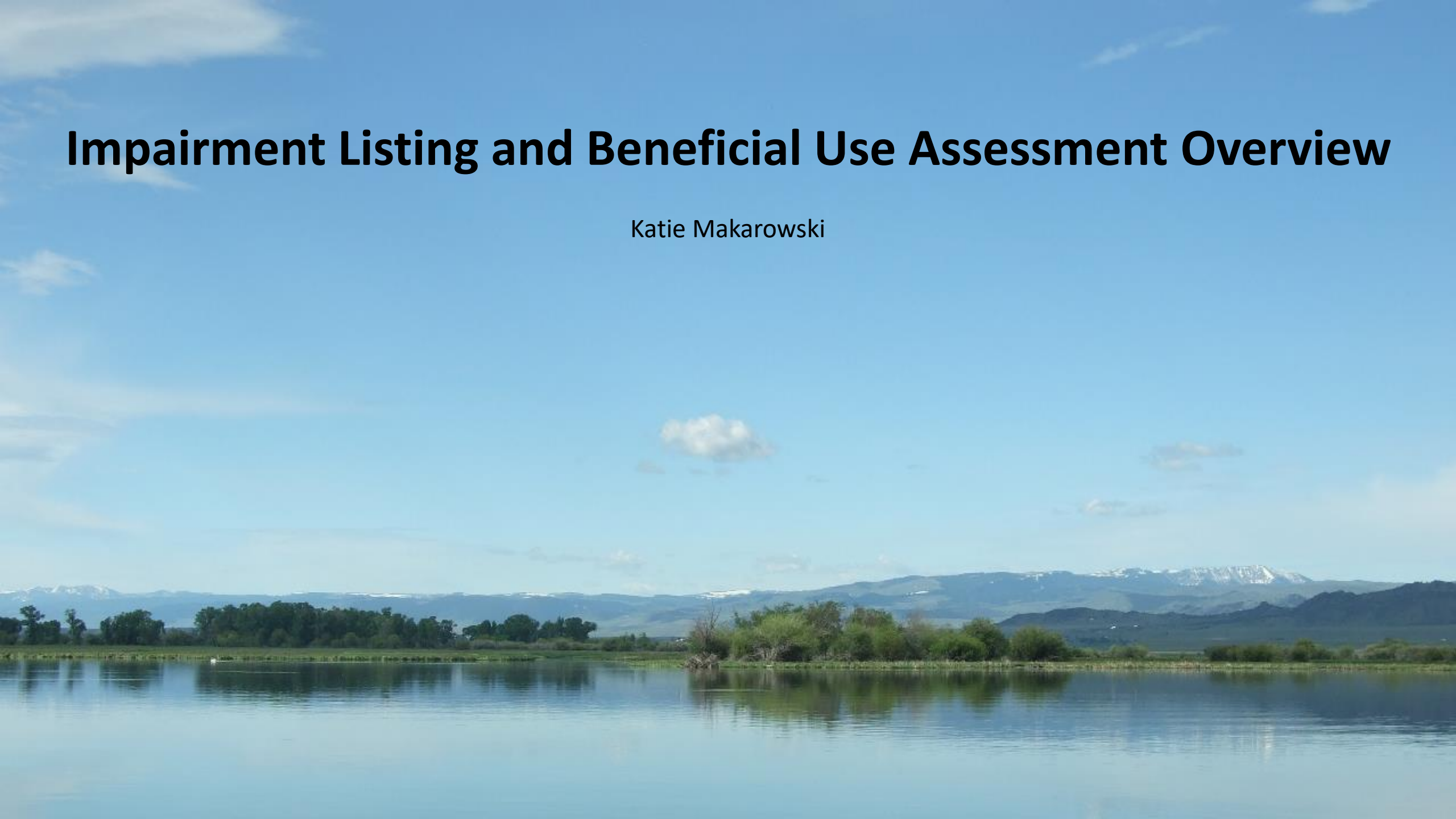
Objective 4: Support DEQ programs' monitoring and data needs

- Supply monitoring resources – equipment, expertise, field support



Impairment Listing and Beneficial Use Assessment Overview

Katie Makarowski



Water Quality Standards

Three elements:

1. Beneficial uses a waterbody is expected to support

- Drinking, culinary, and food processing
- Bathing, swimming, and recreation
- Growth and propagation of fishes and associated aquatic life, waterfowl and furbearers
- Agricultural water supply
- Industrial water supply

2. Criteria that defines the water quality necessary to protect beneficial uses

- Numeric
- Narrative

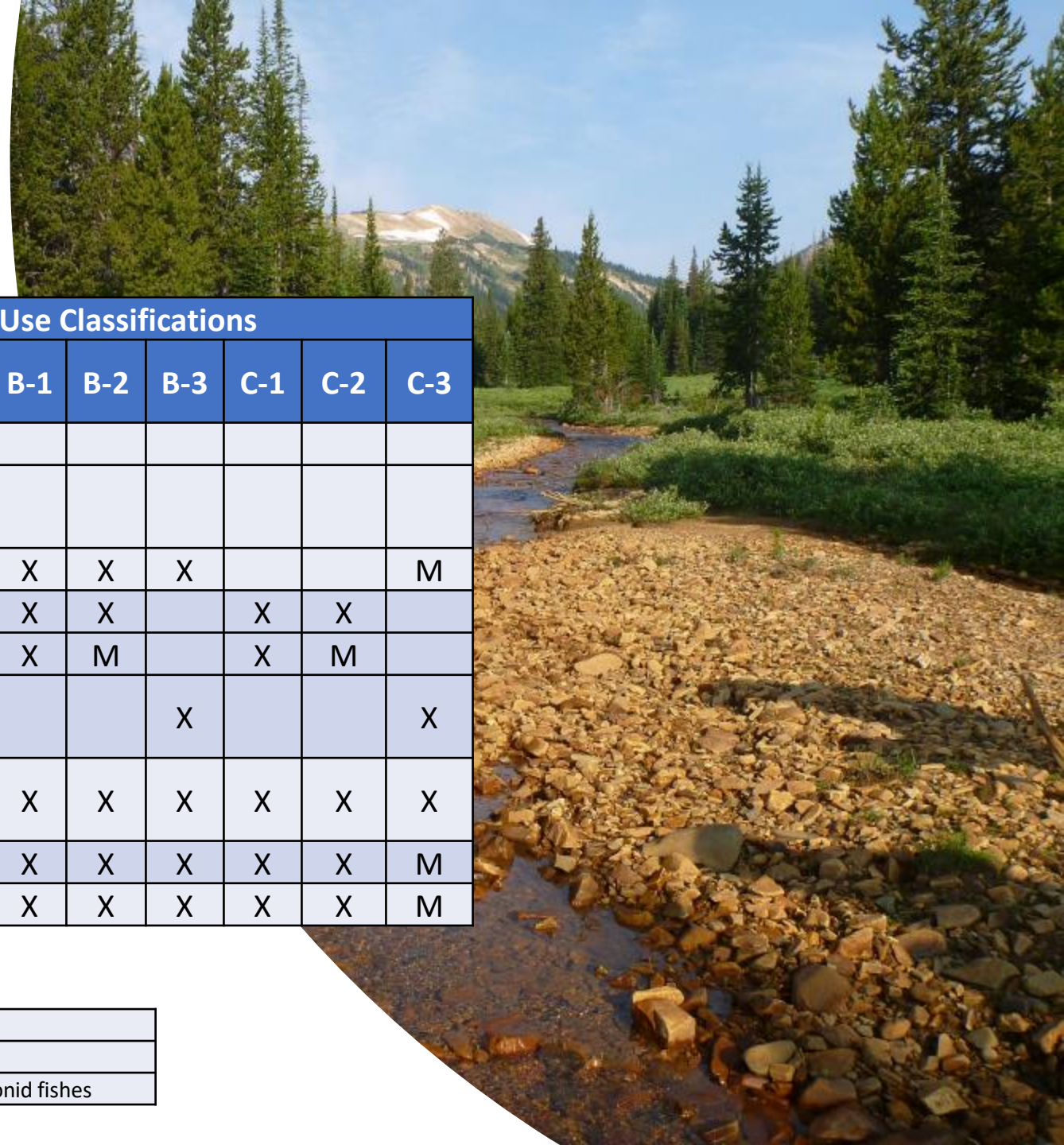
3. Nondegradation requirements to protect existing uses and prevent degradation of high-quality water



Beneficial Use Classifications

Beneficial Uses	Additional distinctions	Use Classifications							
		A-closed	A-1	B-1	B-2	B-3	C-1	C-2	C-3
Drinking, culinary, and food processing	simple disinfection	X							
	conventional treatment of naturally present impurities		X						
	conventional treatment			X	X	X			M
Fishes and associated aquatic life, waterfowl, and furbearers	salmonid growth	X*	X	X	X		X	X	
	salmonid propagation	X*	X	X	M		X	M	
	non-salmonid growth and propagation	X*				X			X
Bathing, swimming, recreation		X	X	X	X	X	X	X	X
Agriculture			X	X	X	X	X	X	M
Industrial			X	X	X	X	X	X	M

X = Beneficial use applies
M = Marginal use applies
* = A-closed does not distinguish between salmonid and non-salmonid fishes



Water Quality Assessment Process

Initiate Project

1. Select project area
2. Define scope/scale:
 - Which waterbodies?
 - Which pollutants?
3. Develop project plan
4. Identify stakeholders and perform initial outreach

Monitoring

1. Develop and implement detailed sampling and analysis plans
2. Often over 2-3 years

Data Quality Assessment

1. Compile data from available sources
2. Evaluate data quality using data quality indicators

Assessment

1. Data analysis: Impairment Listing
2. Data analysis: Beneficial Use Support

Reporting

1. Water Quality Integrated Report -Biennial
2. Clean Water Act Information Center
3. Other

Water Quality Assessment Method

Describes:

- Definitions of key terms and concepts
- Indicators, data types, and thresholds used to distinguish attainment from nonattainment
- Existing and readily available data requirements
- Data quality assessment process
- Impairment listing decision framework
- Beneficial use support decision framework
- Reporting mechanisms used to share water quality assessment information and decisions with EPA & stakeholders



Water Quality Assessment Method: Beneficial Use Assessment and Impairment Listing Methodology for Montana's Surface Waters



Stillwater River

December 2019

Prepared by:
Montana Department of Environmental Quality
Water Quality Division
Water Quality Planning Bureau
Monitoring and Assessment Section |



Water Quality Assessment Method

Revised in 2020; previously revised in 2011

Summary of Changes:

- New descriptive title
- Reorganized the document and added details such as background information, definitions
- Described DEQ's programmatic approach (e.g., prioritization criteria, watershed risk assessment)
- Added two new pollutant-specific assessment methods
 - *E. coli*
 - EC/SAR in select waters in the Tongue/Powder/Rosebud watersheds
- Added a beneficial use support decision framework



Water Quality Assessment Method: Beneficial Use Assessment and Impairment Listing Methodology for Montana's Surface Waters



Stillwater River

December 2019

Prepared by:
Montana Department of Environmental Quality
Water Quality Division
Water Quality Planning Bureau
Monitoring and Assessment Section |

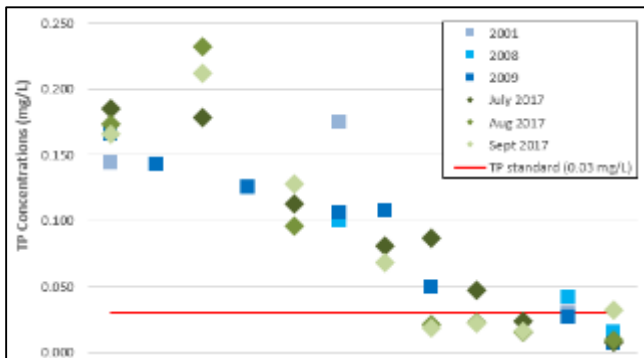


Assessment Decision-Making: Two Steps

1

Impairment Listing Decisions

...deciding whether or not a parameter is meeting water quality standards



Waterbody is nutrient impaired. All indicators show that the stream is not in compliance.
Keep Listed

Waterbody is not nutrient impaired. All indications show that the stream is in compliance.
Do Not List



Unclear — Algae & plants might be taking up nutrients and leading to lower in-stream nutrient concentrations concurrent with high algae and plant biomass; however, diatom metric contradicts DO delta results. Normally in this scenario TP and/or TN would be expected to exceed criteria. Do a level II assessment to complete decision.

Go To Level II

2

Beneficial Use Support Decisions

...deciding whether or not a waterbody is fully supporting each of its designated beneficial uses

Aquatic Life & Fish



Drinking Water



Contact Recreation



Agriculture



Impairment Listing Decisions

...deciding whether or not a parameter is meeting water quality standards

- Decisions are made for individual waterbody-parameter combinations
 - Projects may involve assessing a single waterbody for a single parameter or multiple waterbodies for many parameters
- Decisions are guided by DEQ's parameter-specific assessment methods
- Possible decision outcomes:
 - Non-attainment (**List** or **Keep Listed**)
 - Attainment (**Do Not List** or **Delist**)



Impairment Listing Decisions

- A parameter that does not meet WQ standards is a “cause of impairment” and is added to Montana’s list of impaired waters
- Impairment causes may be pollutants (require a TMDL) or non-pollutants (do not require a TMDL)
- Impairment causes may affect one or several uses
- One or more sources are associated with each impairment cause; sources may be confirmed for not



Impairment Listing Decisions

cwaic.mt.gov

Basin Creek, headwaters to mouth (Boulder River)

MT41E002_030

Impairment Information			
Probable Cause	Probable Sources	Associated Uses	TMDL Completed
Alteration in stream-side or littoral vegetative covers	Forest Roads (Road Construction and Use),Silviculture Harvesting,Silviculture Activities,Impacts from Abandoned Mine Lands (Inactive),Loss of Riparian Habitat,Rangeland Grazing	Aquatic Life	N/A
Aluminum	Acid Mine Drainage,Impacts from Abandoned Mine Lands (Inactive),Mine Tailings,Contaminated Sediments	Aquatic Life	Yes
Arsenic	Mine Tailings,Impacts from Abandoned Mine Lands (Inactive),Acid Mine Drainage,Contaminated Sediments	Drinking Water	Yes
Cadmium	Mine Tailings,Acid Mine Drainage,Contaminated Sediments,Impacts from Abandoned Mine Lands (Inactive)	Aquatic Life	Yes
Copper	Acid Mine Drainage,Impacts from Abandoned Mine Lands (Inactive),Contaminated Sediments,Mine Tailings	Aquatic Life	Yes
Lead	Acid Mine Drainage,Impacts from Abandoned Mine Lands (Inactive),Contaminated Sediments,Mine Tailings	Aquatic Life	Yes
Sedimentation-Siltation	Forest Roads (Road Construction and Use),Mine Tailings,Impacts from Abandoned Mine Lands (Inactive),Loss of Riparian Habitat,Rangeland Grazing,Contaminated Sediments,Silviculture Harvesting,Silviculture Activities	Aquatic Life	Yes
Zinc	Mine Tailings,Contaminated Sediments,Impacts from Abandoned Mine Lands (Inactive),Acid Mine Drainage	Aquatic Life	Yes

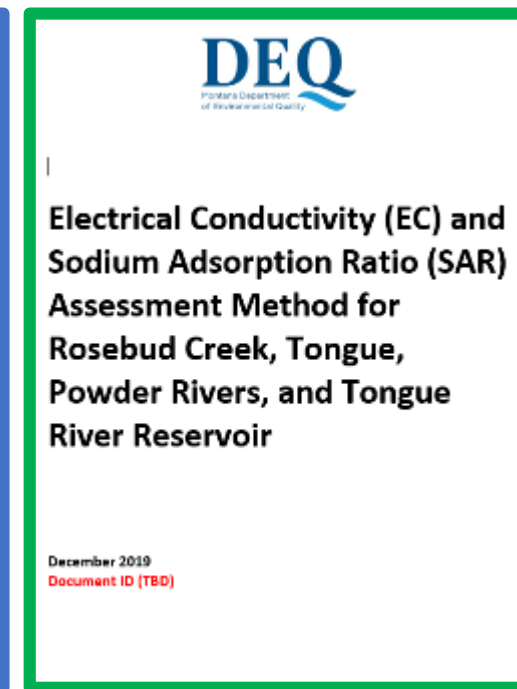
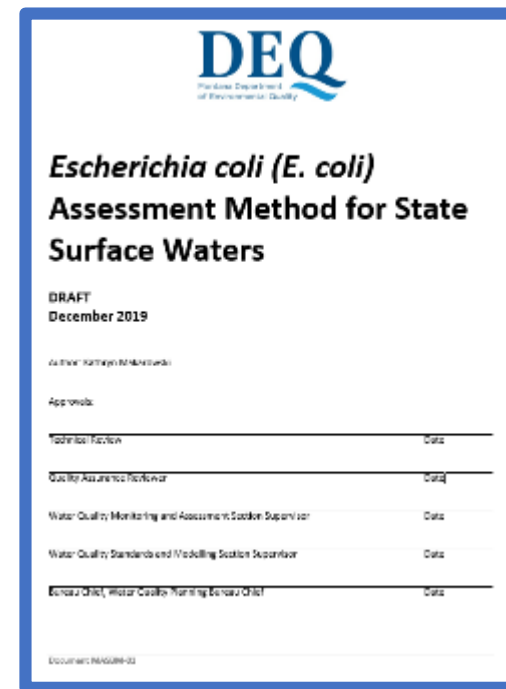
Parameter-Specific Assessment Methods

- Guide consistent decision-making
- They specify:
 - core and secondary indicators
 - thresholds for each indicator to distinguish between attainment and non-attainment
 - data collection requirements
 - data quality objectives
 - data analysis
 - decision rules



Parameter-Specific Assessment Methods

DEQ periodically revises existing or develops new parameter-specific assessment methods...

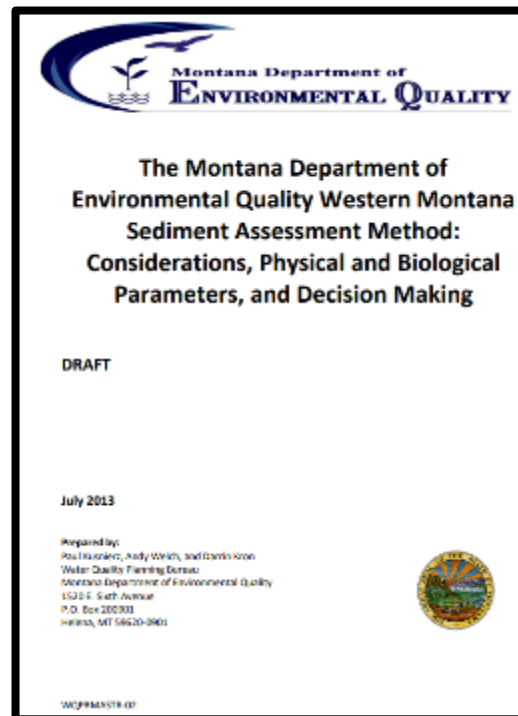
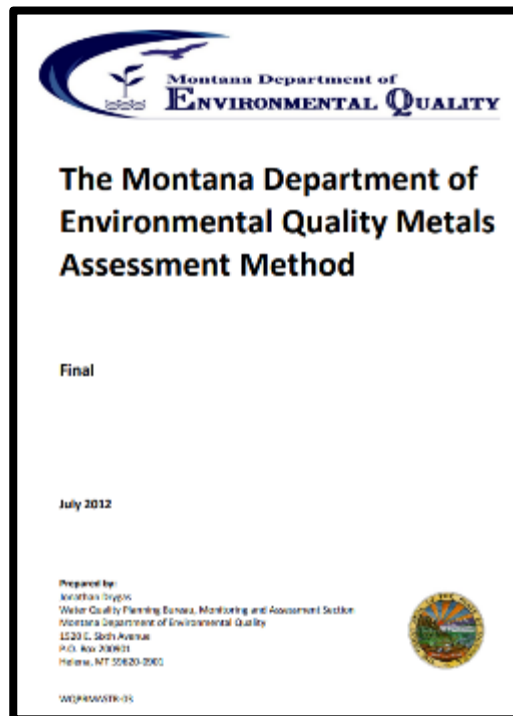
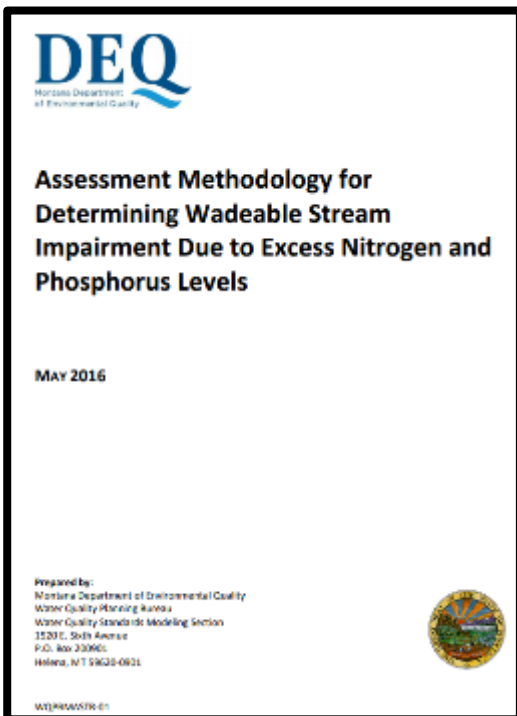


Existing:

- Nutrients (TN, TP; wadeable streams)
- Metals
- Sediment in mountain streams

New:

- *Escherichia coli (E. coli)*
- Electrical Conductivity (EC) and Sodium Adsorption Ratio (SAR) in Rosebud Creek, Tongue River, Powder River, Little Powder River, and Tongue River Reservoir



Beneficial Use Support Decisions

...deciding whether or not a waterbody is fully supporting each of its designated beneficial uses

- Decisions are made for individual waterbody-beneficial use combinations
- Possible decision outcomes:
 - Fully Supporting
 - Not Fully Supporting
 - Insufficient Information
 - Not Assessed



Beneficial Use Support Decisions

Core parameters

- Required to decide full support
- Montana's most common causes of impairment
- Associated with pervasive sources
- High priority for parameter-specific assessment methods

Secondary parameters

- Supplemental
 - Often sources are less pervasive
 - Often resources to monitor them widely are limited
 - Often the tools needed for assessment (e.g., water quality standards, assessment methods) are not available
- Must include if sufficient credible data exists
- Listed as impaired if data provides compelling evidence they are impacting beneficial use support



Beneficial Use Support Decisions

Beneficial Use Support Determination	Description
Not Fully Supporting	Any one parameter associated with the use is not attaining water quality standards
Fully Supporting	All core parameters associated with the use are attaining applicable water quality standards and, if data exists, no secondary parameters associated with the use indicate non-support
Insufficient Information	Some core parameters associated with the use have been assessed and are meeting WQS but not all core parameters have been assessed
Not Assessed	No causes of impairment are linked to the use and no core parameters associated with the use have been assessed



Beneficial Use Assessment Parameters

AQUATIC LIFE AND FISH

Core:

- Nutrients
- Metals
- Sediment
- Biology

Secondary:

- Habitat
- Temperature
- Electrical conductivity
- Sulfate
- Other parameters with numeric aquatic life standards
- Flow alterations
- Turbidity
- pH
- Dissolved oxygen

RECREATION

Core:

- *E. coli*
- Nutrients

Secondary:

- Harmful algal blooms
- Oil & Grease
- Aesthetics/odor

DRINKING WATER

Core:

- Metals
- *E. coli* (A-1 and A-closed waters only)

Secondary:

- Other parameters with numeric human health standards

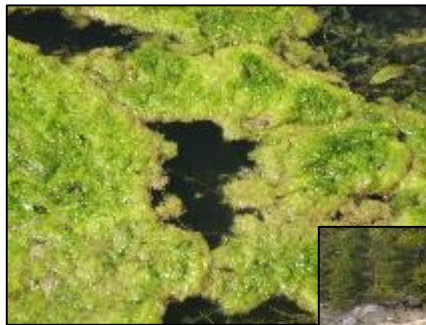
AGRICULTURE

Core:

- EC
- SAR

Secondary:

- Harmful algal blooms



Example Assessment Scenario

Anywhere Creek was assessed for: metals, nutrients, sediment, habitat

Impairment Listing outcome:

- Anywhere Creek is impaired by copper (not meeting aquatic life standards)
- All other assessed parameters are attaining water quality standards

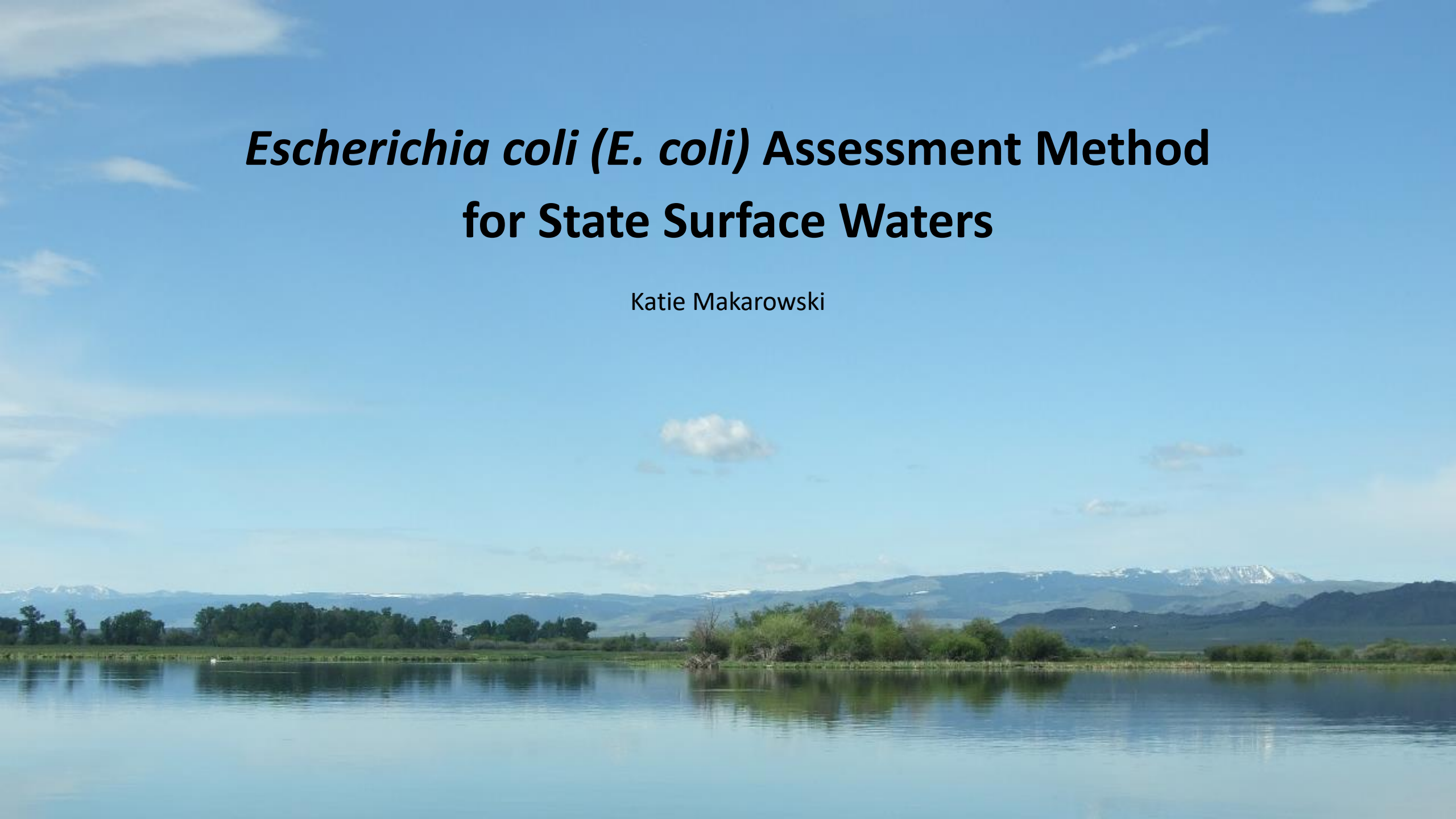
Beneficial Use Support outcome:

- Aquatic Life and Fish: **Not Fully Supporting**
one core parameter is impaired
- Drinking Water: **Fully Supporting**
the only core parameter (metals) meets human health criteria
- Recreation: **Insufficient Information**
one core parameter (nutrients) is not impaired but the other (E. coli) wasn't assessed
- Agriculture: **Not Assessed**
no core or secondary parameters were assessed



***Escherichia coli (E. coli)* Assessment Method for State Surface Waters**

Katie Makarowski



E. coli Water Quality Standards

Applicable beneficial uses:

- Contact Recreation
(primary or secondary)
(prevent gastrointestinal illness in people)
- Drinking water
(A-closed and A-1 waters only)

Two numeric criteria components:

- Geometric mean
- Statistical threshold value

Units:

- Colony-forming units per 100ml
- Most probable number per 100ml

Use Class	Beneficial Use	Applicable Time	Criteria (cfu/100ml or mpn/100ml)	
			Geometric Mean (may not exceed)	Statistical Threshold Value (10% or more may not exceed)
A-1 and A-closed	Drinking water	year-round	32	64
	Primary contact recreation	April 1 - October 31	126	252
	Secondary contact recreation	November 1 - March 31	630	1260
B, C, and I	Primary contact recreation	April 1 - October 31	126	252
	Secondary contact recreation	November 1 - March 31	630	1260
D, E, F, G	Secondary contact recreation	Year-round	630	1260

E. coli Assessment: Preparing the Data

1. Compile all data for an assessment unit
2. Perform DQA
3. Organize data by year
4. Organize data by recreation season
 - Primary contact: April 1 – October 31
 - Secondary contact: November 1 – March 31
5. Group result values by consecutive 30-day period
 - For samples collected at or near the same location within 24 hours, calculate the geometric mean of these dependent samples and include the geometric mean in future calculations.



E. coli Assessment: Contact Recreation

“...standards for *Escherichia coli* bacteria are based on a minimum of five samples obtained during separate 24-hour periods during any consecutive 30-day period” (ARM 17.30.620(2))

Preferred approach (30-day analysis)

For any consecutive 30-day period with at least 5 independent result values collected during separate 24-hour periods:

- Impaired if any 30-day GM exceeds the GM criteria or if $\geq 10\%$ of samples exceed the STV criteria
- If 30-day approach does not indicate impairment or minimum data requirement is not met, proceed to alternate approach with remaining data.



1

2

3

4

E. coli Assessment: Contact Recreation

When 30-day minimum data requirement is not met but a substantial amount of data within a recreation season exists (e.g., 2 samples per month in a recreation season)

Alternate approach (recreation season analysis)

1 For all contact recreation seasons with at least 11 independent result values collected during 5 separate 24-hour periods:

- 2
- Impaired if any recreation season GM exceeds the GM criteria or if $\geq 10\%$ of samples exceed the STV criteria
 - Not impaired if both 30-day approach and recreation season approach indicate non-impairment.
 - If remaining data exists or minimum data requirement for recreation season approach is not met, proceed to overwhelming evidence approach.
- 3
- 4



E. coli Assessment: Contact Recreation

When additional data not already incorporated 30-day or recreation season analysis doesn't meet minimum data requirements but has substantial exceedances of the STV criteria (e.g., 5 samples throughout recreation season with 4 exceedances)

Overwhelming evidence

1 For any remaining data not yet used in 30-day or recreation season approaches:

- 2
- Overwhelming evidence of impairment if there are at least 5 result values obtained during separate 24-hour periods within an individual contact recreation season and ≥ 4 values exceed the STV criteria.
 - If minimum data requirement is not met and there is remaining data, proceed to final risk assessment.
- 3
- 4



E. coli Assessment: Contact Recreation

When data is insufficient for assessment using 30-day or recreation season approach and doesn't indicate overwhelming evidence; help guide future actions.

Final risk screening

For any remaining data not already incorporated into 30-day, recreation season or overwhelming evidence analysis:

- If 0 or 1 exceedance of STV criteria, then insufficient information to assess and no further action.
- If ≥ 2 exceedances of STV criteria but unlikely that the waterbody is used for primary contact recreation, then insufficient information to assess and no further action.
- If ≥ 2 exceedances of STV criteria and likely that the waterbody is used for primary contact recreation, DEQ will consider additional monitoring (as resources allow) to enable future assessment.



1

2

3

4

E. coli Assessment: Drinking Water

Applicable to A waters only.

Preferred approach (30-day analysis)

For all 30-day periods with at least 5 independent result values collected during separate 24-hour periods:

- Impaired if any 30-day GM exceeds the GM criteria or if $\geq 10\%$ of samples exceed the STV criteria
- If each 30-day period indicates non-impairment or if no 30-day period meets the minimum data requirement, proceed to overwhelming evidence.

Overwhelming evidence

For any remaining data not yet used in 30-day approach:

- Overwhelming evidence of impairment if there are at least 5 result values obtained during separate 24-hour periods within an individual contact recreation season and ≥ 4 values exceed the STV criteria.



Questions?



Electrical Conductivity (EC) and Sodium Adsorption Ratio (SAR) for Rosebud Creek, Tongue, Powder, and Little Powder Rivers, and the Tongue River Reservoir

Chace Bell



Numeric Criteria for EC and SAR

Waterbody	Irrigation Season (3/2 – 10/31)				Non-Irrigation Season (11/1 – 3/1)			
	EC		SAR		EC		SAR	
	Monthly Average	Do Not Exceed	Monthly Average	Do Not Exceed	Monthly Average	Do Not Exceed	Monthly Average	Do Not Exceed
Tongue River	1000	1500	3	4.5	1500	2500	5	7.5
Powder River	2000	2500	5	7.5	2500	2500	6.5	9.75
Little Powder River	2000	2500	5	7.5	2500	2500	6.5	9.75
Rosebud Creek	1000	1500	3	4.5	1500	2500	5	7.5
Tongue River Reservoir	1000	1500	3	4.5	1000	1500	3	4.5

Method applies to these waters only

Applicable beneficial use:

- Agriculture

Criteria:

- Seasonal for streams (irrigation, non-irrigation)
- Year-round for reservoir

EC and SAR Assessment: Data Requirements

EC

- SC data is evaluated with EC criteria
 - EC = ability of water to conduct electrical current at 25°C
 - SC = measurement of ability of water to conduct electrical current corrected to 25°C
- SC data:
 - Continuous (preferred): measured with deployed data logger every 30 min.
 - Instantaneous: measured with a hand-held meter
 - Discrete: water grab samples analyzed by a lab for SC

SAR

- SAR data is evaluated with SAR criteria
 - SAR = ratio of Na concentration divided by the square root of one half of the Ca + Mg concentration
- SAR data:
 - Discrete: water grab samples analyzed by a lab for Na, Ca, Mg



EC and SAR Assessment: Data Requirements

- Data can be from one site, more are preferred
- Include data from recent 10 years unless excluded because no longer representative due to changes in watershed sources
- Minimum data requirements:
 - Must represent at least 3 years
 - Must represent at least 3 calendar months per year
 - Recommend targeting the irrigation season (3/2 – 10/31), especially early (ice-off to June)
 - Continuous data (preferred): SC measured at equal time interval (30 min) for every 24-hour period of the calendar month
 - Mixed continuous and discrete data: at least four samples per calendar month spaced one week apart; data must represent at least 1 day of each week with 3 or more days in the month



EC and SAR Assessment: Data Analysis

1. Group results by year
2. Group results by season
3. Calculate monthly averages and compare against “monthly average” criteria
 - Continuous data: average all individual result values collected on equal time interval throughout month
 - Mixed continuous and discrete data:
 1. Calculate daily averages using all result values
 2. Calculate weekly averages using all daily averages
 3. Calculate monthly average using weekly averages
4. Compare each individual result value against “do not exceed” criteria



EC and SAR Assessment: Decision-Making

List or Keep Listed

- If any monthly average exceeds the monthly average criteria
- If one or more result value exceeds the do not exceed criteria
- If already listed and minimum data requirements are not met

Do Not List or Delist

- If no month exceeds the monthly average criteria
- If no result value exceeds the do not exceed criteria

- An assessment unit may be listed for **either** SC or SAR if data for only one parameter (SC or SAR) is available.
- To delist, there must be **both** SC and SAR data available for assessment.



Questions?



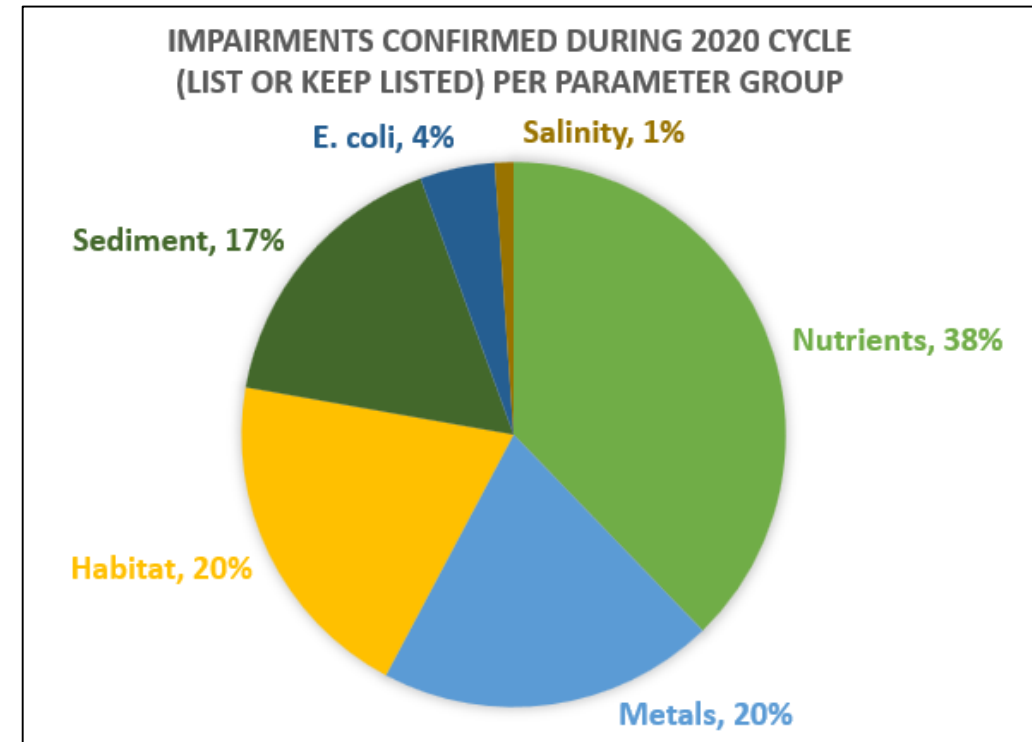
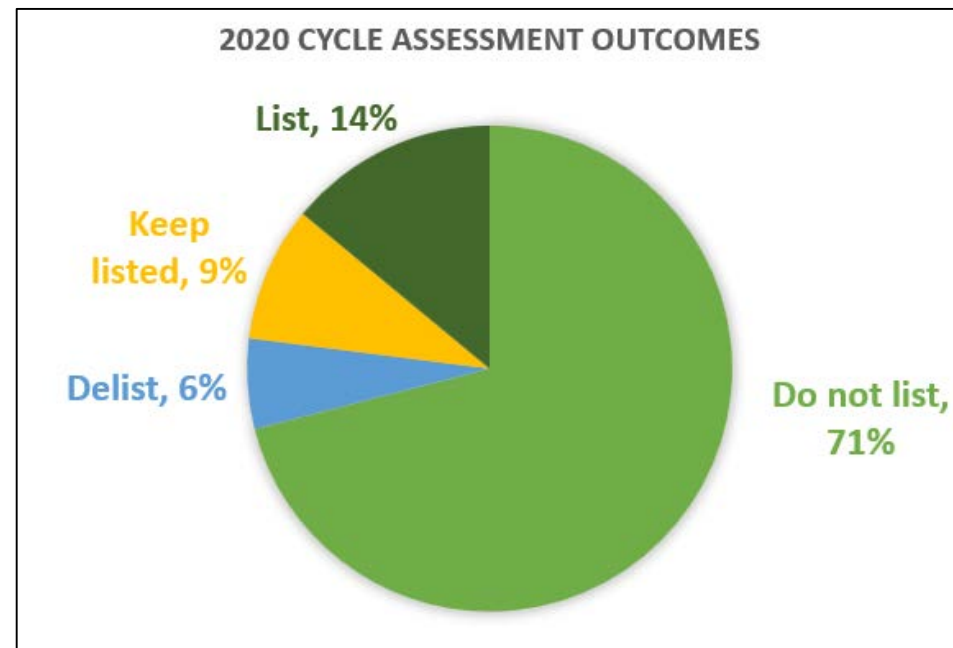
Draft 2020 Cycle Overview

Darrin Kron



Draft 2020 Water Quality Integrated Report

- Fulfills reporting requirements in Clean Water Act sections 303(d) and 305(b)
- Public comment planned to open in early February
- 2020 cycle summary:
 - Slimmed down content
 - Assessed 34 waterbody assessment units
 - Assessed 399 waterbody-parameter combinations
 - Assessments in various watersheds: Red Rock, Beaverhead, Swan, Middle Kootenai, Tongue River, and Stillwater



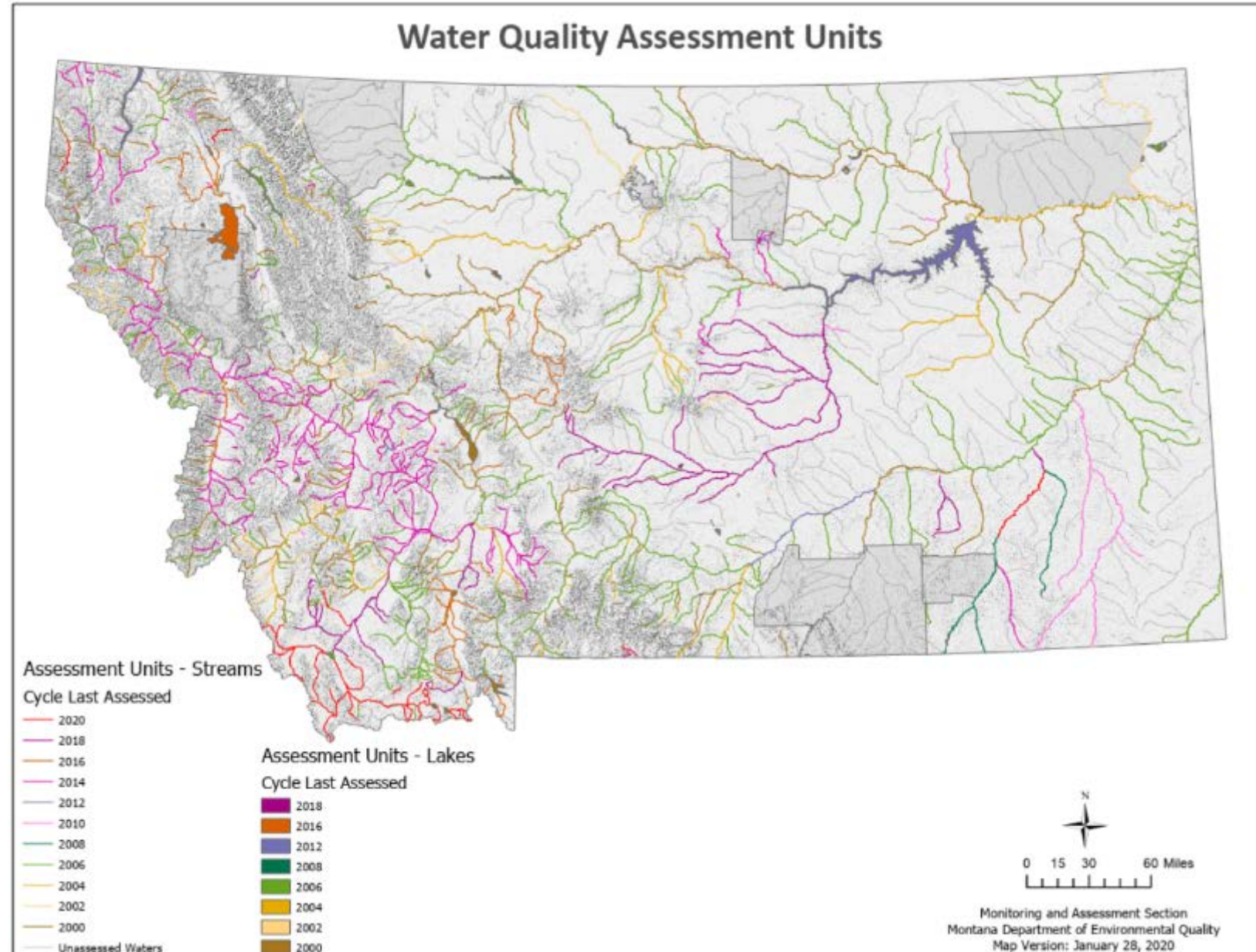
Next Cycle and Beyond

Assessment methods that will likely be updated or developed for 2022 IR:

- Sediment
- Metals/Toxics/PCB

Tentative Assessments for 2022:

- Yellowstone River
 - Select tributaries in the Bitterroot
 - Goat Creek
 - Others



Questions?



**ATTACHMENT B: MONITORING AND ASSESSMENT, TMDL, AND
NONPOINT SOURCE PROGRAM UPDATES PRESENTATION**



Water Quality Planning: Monitoring, TMDL, and Nonpoint Source Program Updates

January 29, 2020



2020 Monitoring and Assessment Projects

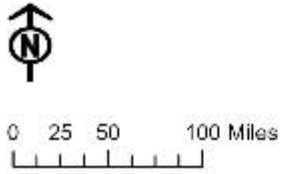
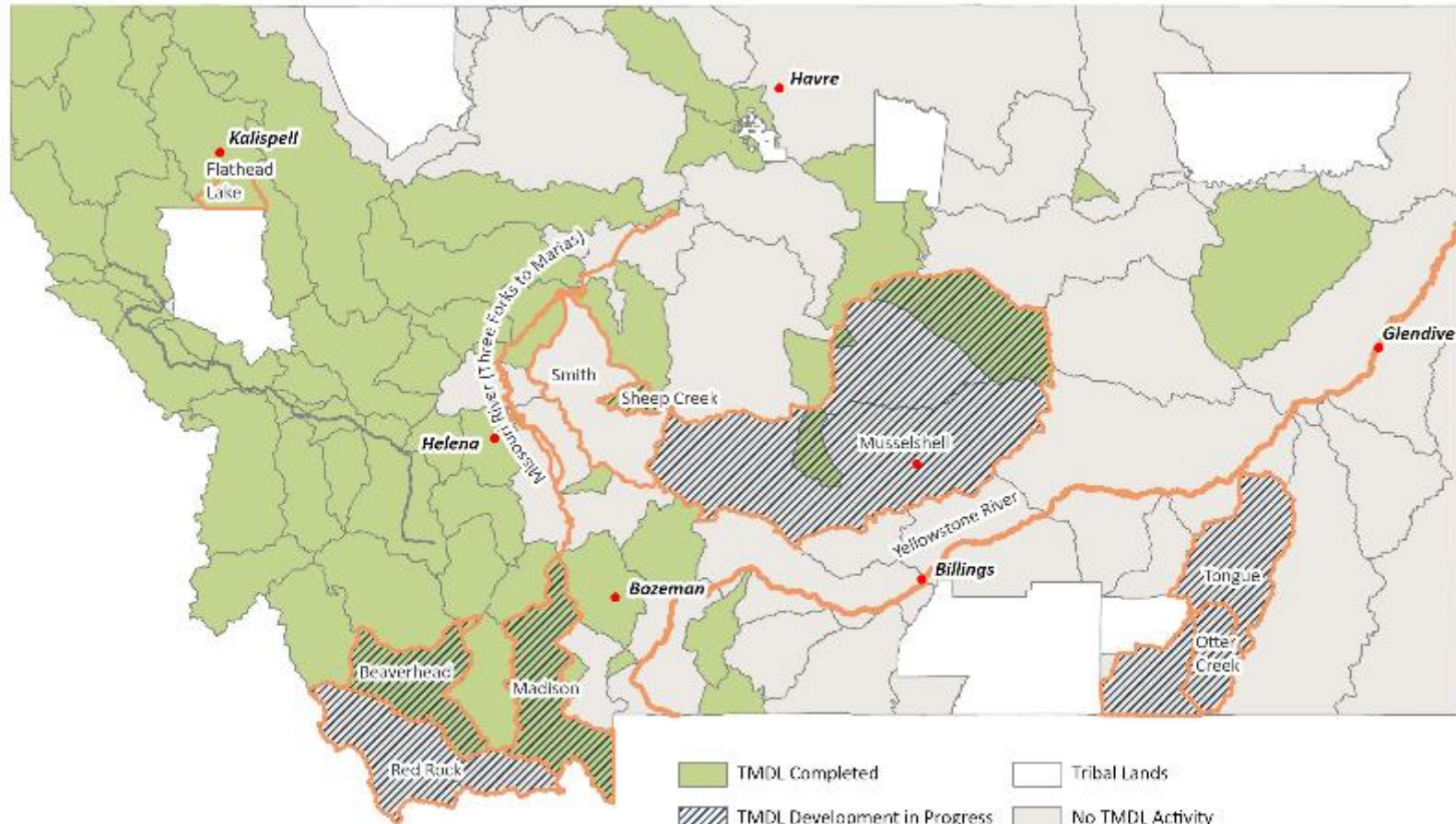


0 100 200 Miles

Priority Areas for Water Quality Monitoring and Assessment in 2020

- New TMDL Area Support:
 - Yellowstone – nutrients, metals
 - Missouri – nutrients, metals
 - Smith River – nutrients
 - Middle Fork Judith River - Sediment
- Threats to Water Quality:
 - Upper Gallatin – nutrients
 - Lake Koocanusa – selenium and nutrients
- Success Stories and Trends:
 - Clark Fork – nutrients
 - Various - sediment
 - Nevada Creek – nutrients
- Focus Restoration Areas
 - Bitterroot – sediment and nutrients
 - Lower Gallatin - nutrients
- Supporting others:
 - Various volunteer programs as they apply
 - Lake Mary Ronan – nutrients
 - Big Horn River – nutrients, selenium, turbidity
 - FWP – save the grayling in Red Rock Lake

TMDL Development Status



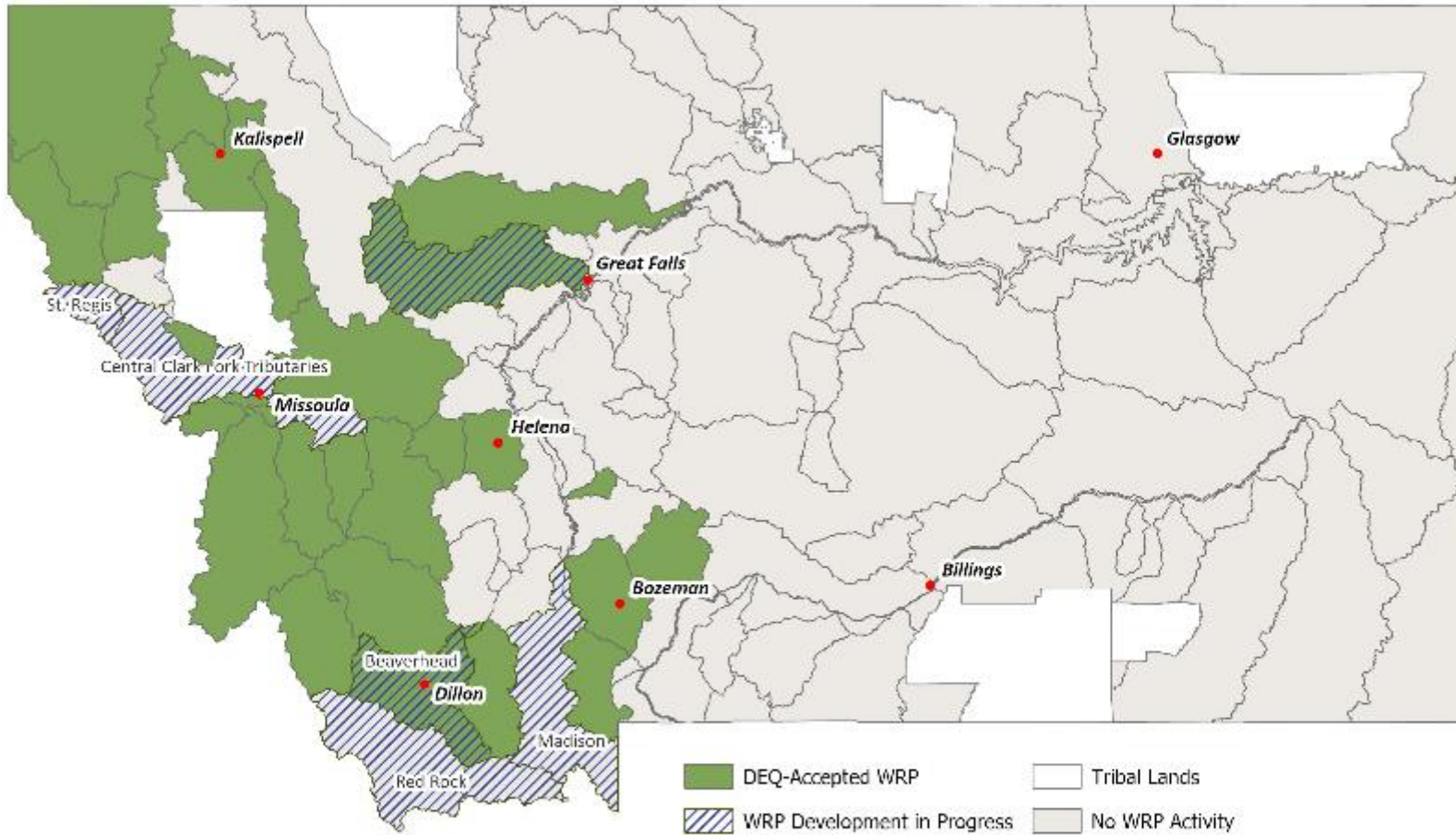
Status of TMDL Projects / 2020 Project Schedule

TMDL Priority Areas:

Madison Watershed, Beaverhead Watershed, Musselshell Watershed, Sheep Creek, Tongue River, Red Rock Watershed, Yellowstone River, Smith River, Missouri River, Flathead Lake, Otter Creek

- TMDLs in progress:
 - Sheep Creek Aluminum – Out for stakeholder review
 - Madison Watershed Temperature and Sediment - stakeholder review Spring 2020
 - Beaverhead Watershed Nutrients and Metals – stakeholder review Spring/Summer 2020
 - Musselshell Watershed Nutrients and E. coli – data analysis/source assessment
 - Red Rock Watershed Nutrients, Metals, E. coli, and Sediment – source assessment data collected, QC'd, and input in to database
 - Tongue River – drafting allocation papers – waiting for completed modeling report
- Pre-TMDL Assessment Initiated:
 - Yellowstone River Nutrients, Smith River Watershed Nutrients, Missouri River Nutrients (Three Forks to Marias)
- TMDL development starting post 2022
 - Smith River, Flathead Lake, Otter Creek (on hold)

Watershed Restoration Plan (WRP) Development Status



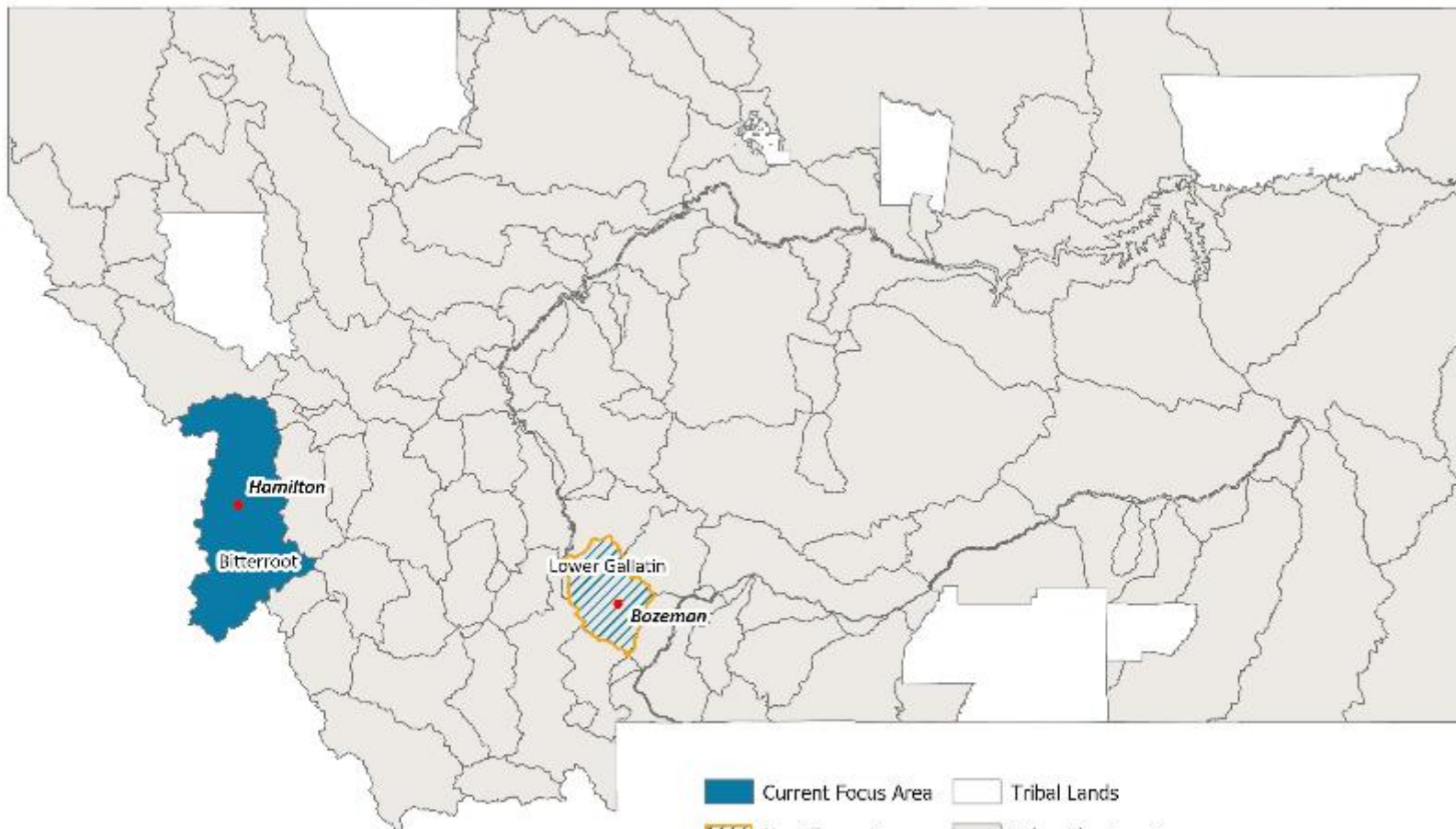
0 25 50 100 Miles

01/21/2020 - DEQ Watershed Protection Section

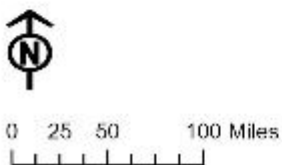
DEQ Accepted
WRPs 2019

- Bitterroot Update
- Lower Clark Fork

Focus Area Status



- Current Focus Area
- Next Focus Area
- Tribal Lands
- Other Planning Areas



Focus Watershed Characteristics

- Locally-developed Watershed Restoration Plans (WRPs) in place
- Stakeholder interest
- Opportunities to track changes in water quality and other indicators
- Cost-effective BMPs can remedy most NPS pollution
- Existing partnership with DEQ and ability to increase momentum
- Potential to reduce a community's point source treatment costs
- Coinciding priorities with programs internal and external to DEQ

Discussion



Planning for next STAG meeting

WPCAC/STAG coordination - Both authorized in statute, both tasked with advising Dept. on water quality issues.

- Best way to move forward on coordination?
 - Annual concurrent meetings
 - Provide agenda to both groups for option to meet/call-in
 - Coordinate meetings within the same day or two

WPCAC

(Water Pollution Control Advisory Group)

- Authorized under MCA 2-15-2107
- Tasked to advise the department on matters related to water pollution and the adoption of rules under the water quality act.
- Nominated by their interest group, appointed by governor

STAG

(Statewide TMDL Advisory Group)

- Authorized under MCA 75-5-702
- Tasked to advise the Department on topics including TMDL Development Priorities, water quality assessment methods and data management, and TMDL implementation monitoring.
- Nominated by their interest group, appointed by DEQ Director

Membership

WPCAC

STAG

<i>Inorganic waste</i>	Earl Salley	<i>Federal land management</i>	Alden Shallcross
<i>Organic waste</i>	Eric Campbell	<i>Water-based recreationists</i>	Joe Gutkoski
<i>Soil and Water Conservation Districts</i>	Stevie Neuman	<i>Eastern Conservation Districts</i>	Stephen Granzow
		<i>Western Conservation Districts</i>	Dean Sirucek
<i>Irrigated agriculture</i>	VACANT	<i>Farming-oriented agriculture</i>	John Youngberg
<i>Production agriculture</i>	Michael Wendland	<i>Livestock-oriented agriculture</i>	Jay Bodner
<i>Public works</i>	Craig Workman	<i>Municipalities</i>	Ryan Leland
<i>Realtor</i>	Mary Ahmann Hibbard	<i>State trust land management</i>	Jeff Schmalenberg
<i>Conservation Organization</i>	Bob Zimmer	<i>Conservation interests</i>	John DeArment
<i>Professional engineer</i>	Karen Sanchez	<i>Point source dischargers</i>	David Mumford
<i>Fisheries biologist</i>	Trevor Selch	<i>Fishing-related business</i>	Mike Geary
<i>Member of the public</i>	Adam Sigler	<i>Hydroelectric industry</i>	Jordan Tollefson
		<i>Forestry industry</i>	Brian Sugden
		<i>Mining</i>	Doug Parker