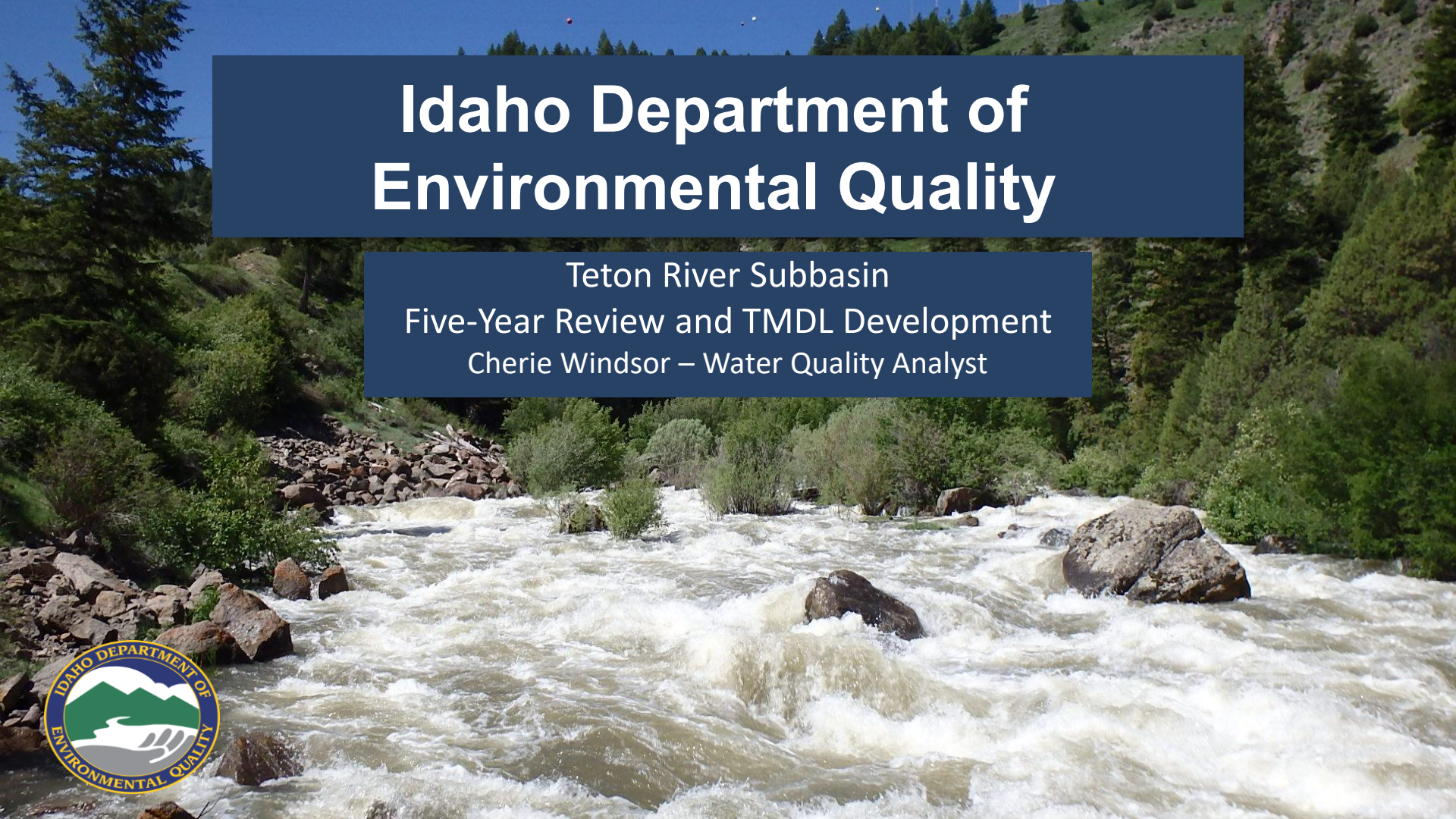


Idaho Department of Environmental Quality

Teton River Subbasin
Five-Year Review and TMDL Development

Cherie Windsor – Water Quality Analyst

Presentation Overview

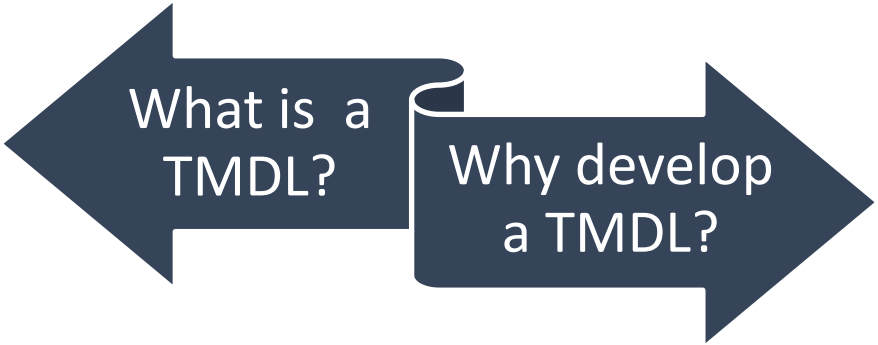
- DEQ's mission and goals
- TMDLs and 5-Year Reviews
- Existing TMDLs in the Teton River subbasin
- Data collection in the Teton River subbasin
- Next steps

The DEQ Mission

To protect human health and the **quality** of Idaho's air, land, and **water**.

Total Maximum Daily Load (TMDL)

Establishes the maximum amount of a pollutant allowed in a water body



Planning tool for restoring water quality

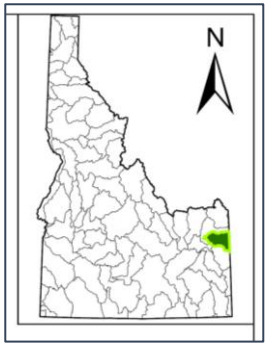
Components of a TMDL

- Load Capacity
- Existing Loads
- Margin of Safety
- Load Allocation
- Reduction Requirements

The Five-Year Review

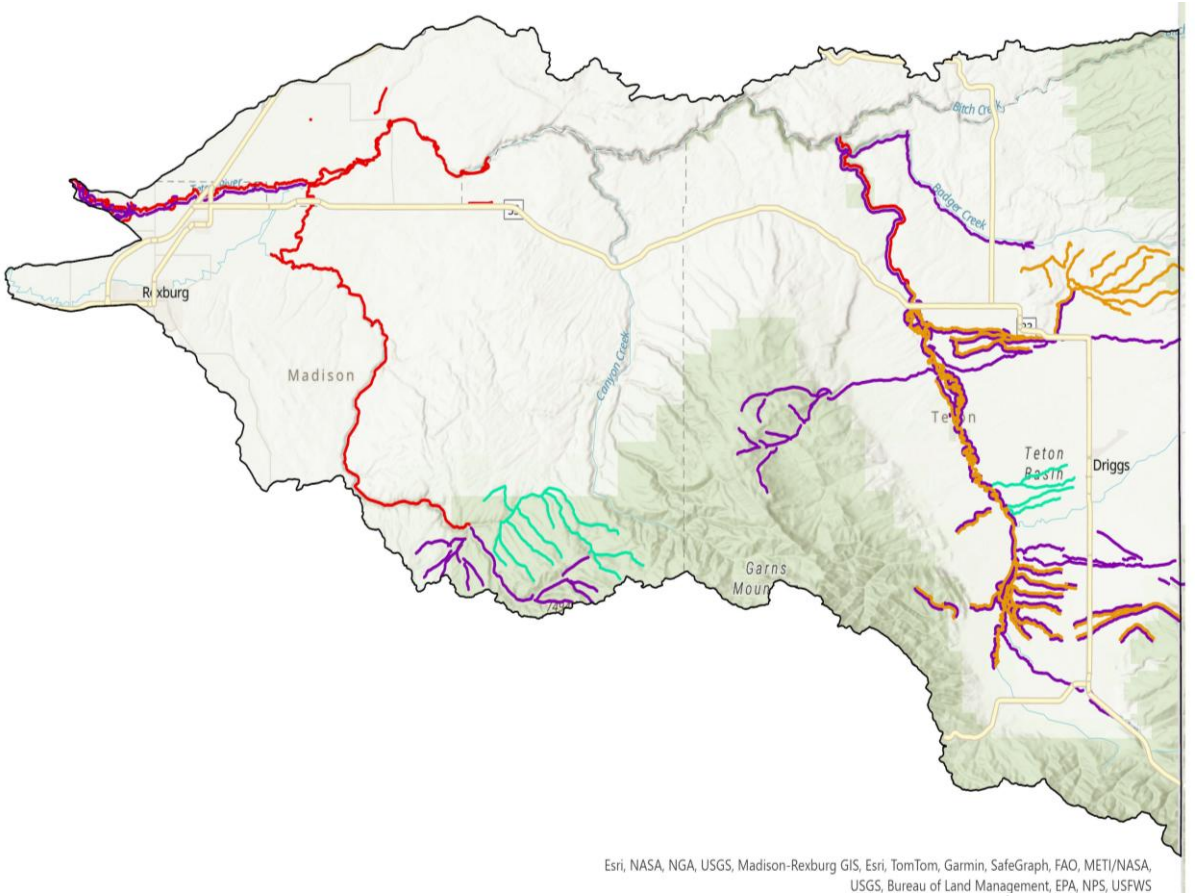
- Evaluate past TMDLs
- Perform additional monitoring
- Revise TMDLs
- Remove TMDL when water quality has been restored

Existing TMDLs in the Teton River Subbasin



Current Status

- Bacteria (E. COLI)
- Nutrients
- Sediment
- Temperature

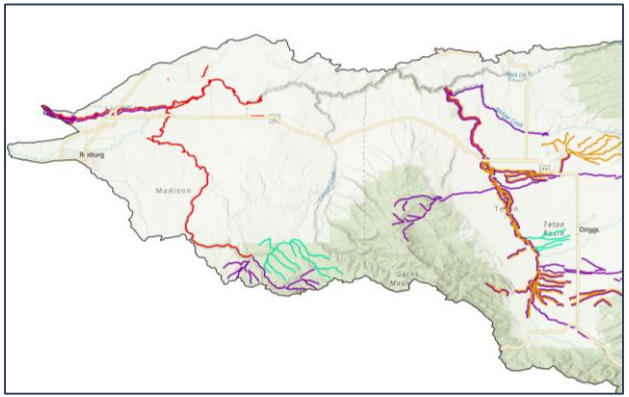


Data Collection

- Beneficial Use Reconnaissance Program (BURP)
- Bacteria
- Nutrients
- Sediment
- Temperature

Talking Points

- Applicable water quality criteria – targets to aim for
- Map – existing TMDLs and recent monitoring efforts
- Trends – then and now



BURP Data

- Focus on Indicators of cold-water aquatic life

Macroinvertebrate Sampling

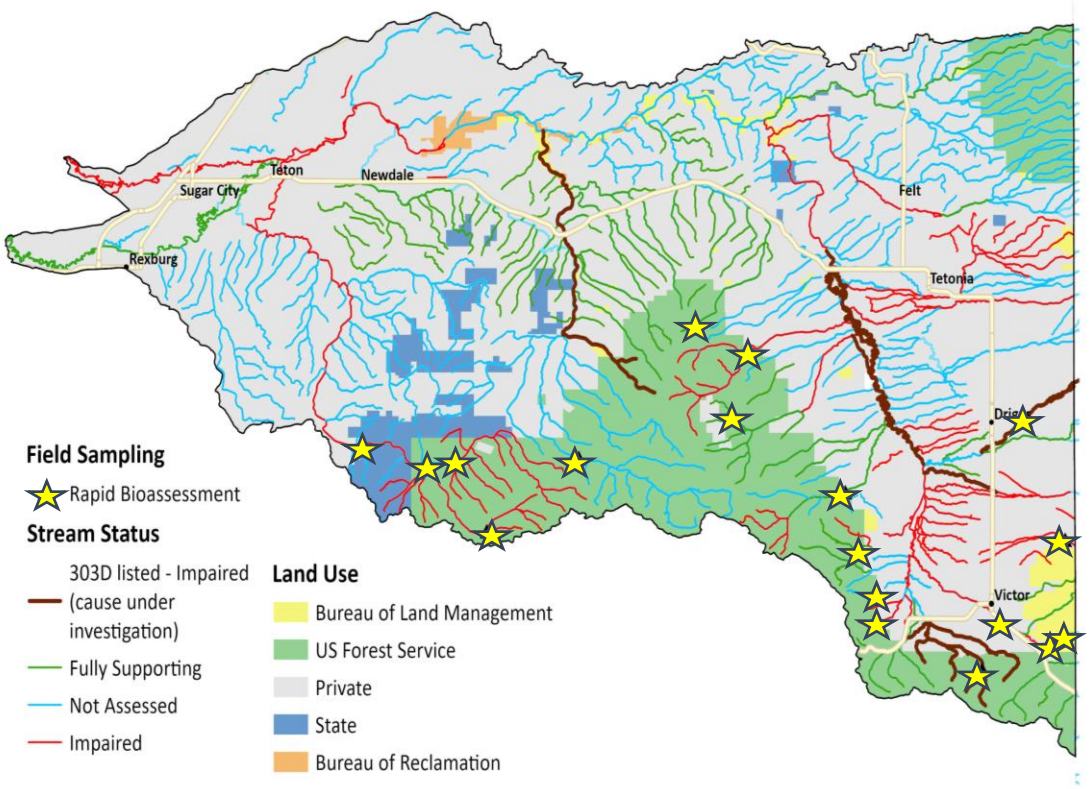
Habitat Assessment

Fish Community

BURP Assessment Locations

2021-2025

- 22 sites
- 2 sites not able to be sampled
- Results pending on many



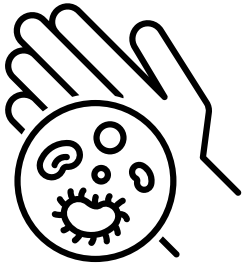
BURP Trends and Results

Last 10 years

- 2015-2025: 29 BURP Assessments
  - 14 are supporting
  - 1 was not supporting (Teton Creek in 2015)
  - 14 results are still processing

Water Quality Criteria for Recreation Use Designations

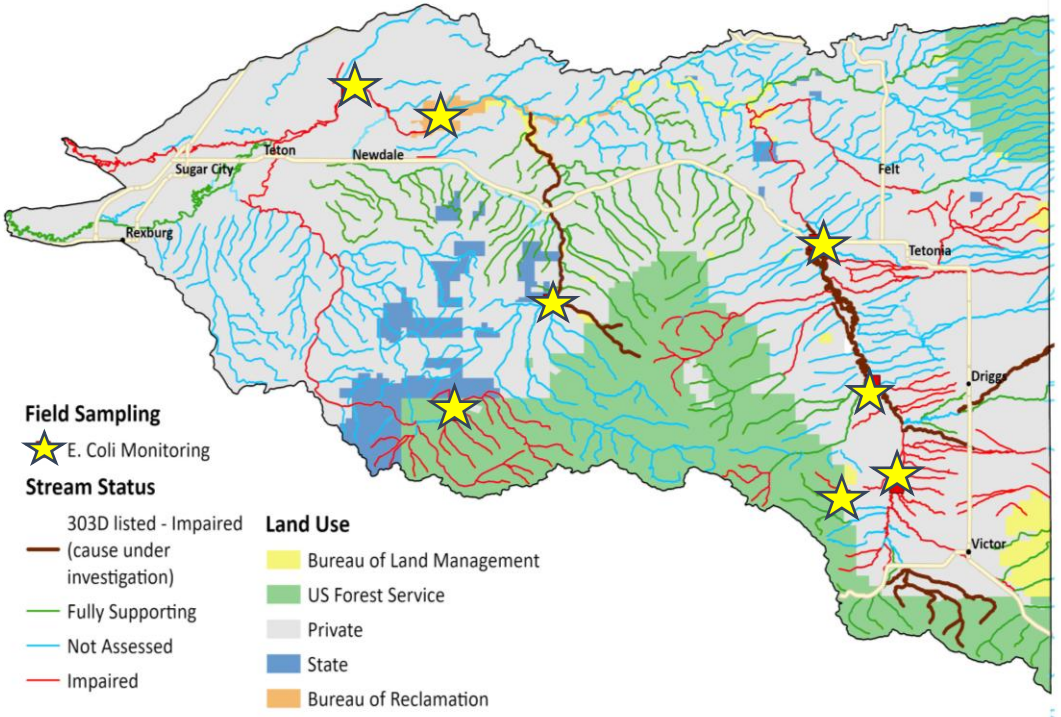
- Fecal indicators – *E. coli* bacteria
- *E. coli* bacteria not to exceed:
  - 126 *E. coli* counts per 100 mL
  - Minimum of 5 samples taken



Bacteria Monitoring

2017-2025

- 8 sites sampled
- 3 sites not supporting
- 2 new TMDLs



Bacteria Trends

Target: Geometric mean of 126 *E. coli* counts per 100 mL

Stream Name	Geometric Mean	Trends: Improving, Static, Declining	
North Fork Moody Creek	439.4		Improving. 2011 geometric mean was 817.9 MPN/100 mL.
Driggs Springs spring creek complex	191		Static
Woods Creek	191		Static
Warm Creek – Canyon Creek watershed	19		Delist for E. coli in 2026
Warm Creek – Trail Creek watershed	50.4		Delist for E. coli in 2026
Teton River– near Harrop's Bridge	324.3		New TMDL in development
Teton River – Teton Creek to Horseshoe Creek	227.1		New TMDL in development

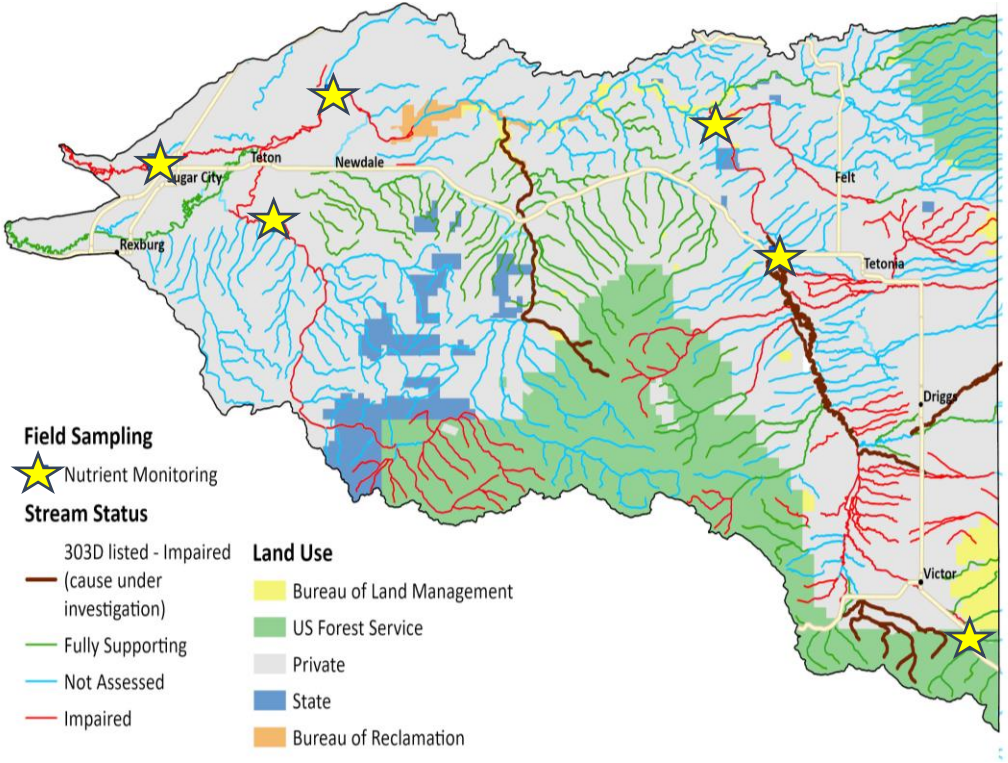
Water Quality Criteria for Nutrients

- Narrative criteria for nutrients
- The target concentrations used in the 2003 TMDLs
  - Nitrogen nitrate < 0.3 mg/L
  - Total phosphorus < 0.1 mg/L

Nutrient Monitoring

2024-2025

- 6 sites (2 reference sites)
- Nitrogen and total phosphorus compared to the 2003 TMDLs



Nutrient Trends

Improving, Static, Declining?

Stream Name	Pollutant	Percent Reduction Required		Trends: Improving, Static, or Declining
		2003 TMDLs	2024-2025 Data Collection	
North Fork Teton River - Teton River Forks to Henrys Fork	Total Phosphorus	70%	0%	↑
Teton River - Teton Dam to Teton River Forks				
Moody Creek - confluence of North and South Fork Moody Creek	Total Phosphorus	59%	0%	↑
Teton River - Felt Dam outlet to Milk Creek	Nitrogen, Nitrate	38%	62%	↓
Teton River - Felt Dam pool	Total Phosphorus	78%	0%	↑
Teton River - Highway 33 bridge to Felt Dam pool				

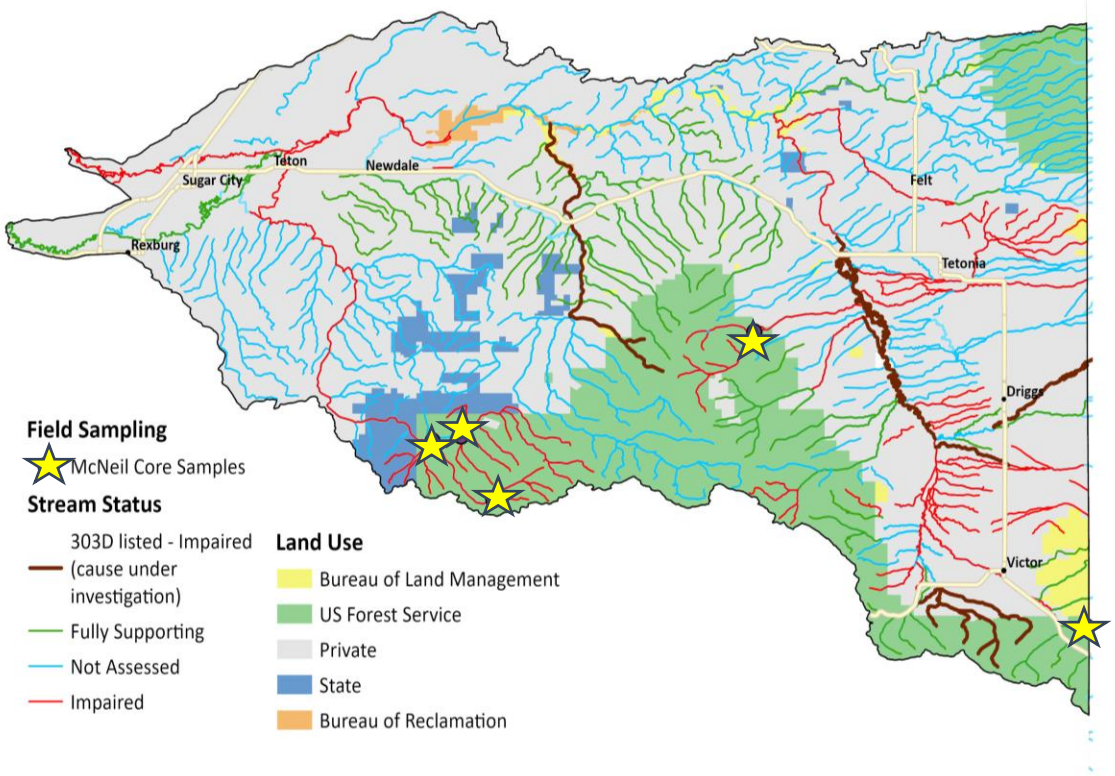
Water Quality Criteria for Sediment

- Sediment criteria is narrative
- Evaluate fine sediment
- General targets
  - less than 10% fine sediments < 0.85 mm
  - less than 25-30% fine sediments < 6.34 mm.

Sediment Monitoring

2024-2025

- 5 sites (1 reference site)
- McNeil Core sampling



McNeil Core Sampling Procedures

Find salmonid spawning habitat.

Obtain a core sediment sample.

Separate sediment sizes by volumes and calculate total percentages.

McNeil Core Sampling Results

Stream Name	% Fines <0.85 mm	% Fines <6.34 mm	Targets Met?
South Fork Moody Creek	16	41	
South Fork Moody Creek	10	27	
North Fork Moody Creek	10	22	
Packsaddle Creek	2	11	
Moose Creek - border to mouth - reference site	2	10	

- McNeil core samples collected between 2017 and 2025.
- General targets:
  - less than 10% fine sediments < 0.85 mm
  - less than 25-30% fine sediments < 6.34 mm.

Overall Sediment Trends

- Total of 24 sediment TMDLs
  - 11 AUs are
  - 6 AUs are unknown
  - 6 AUs are improving
  - 1 AU listed in error in 2003

Sediment Improving AUs

- Teton River - Felt Dam outlet to Milk Creek
- Packsaddle Creek
- Trail Creek
- Fox Creek
- Badger Creek-spring to mouth
- Badger Creek

Thanks to all the restoration efforts and best management practices being implemented!

Water Quality Criteria for Temperature

Cold Water Aquatic Life	22° C or less for daily maximum
	19° C or less for daily average
Salmonid Spawning	13° C or less for daily maximum
	9° C or less for daily average

- Numeric criteria
- Different requirements for cold water aquatic life and salmonid spawning

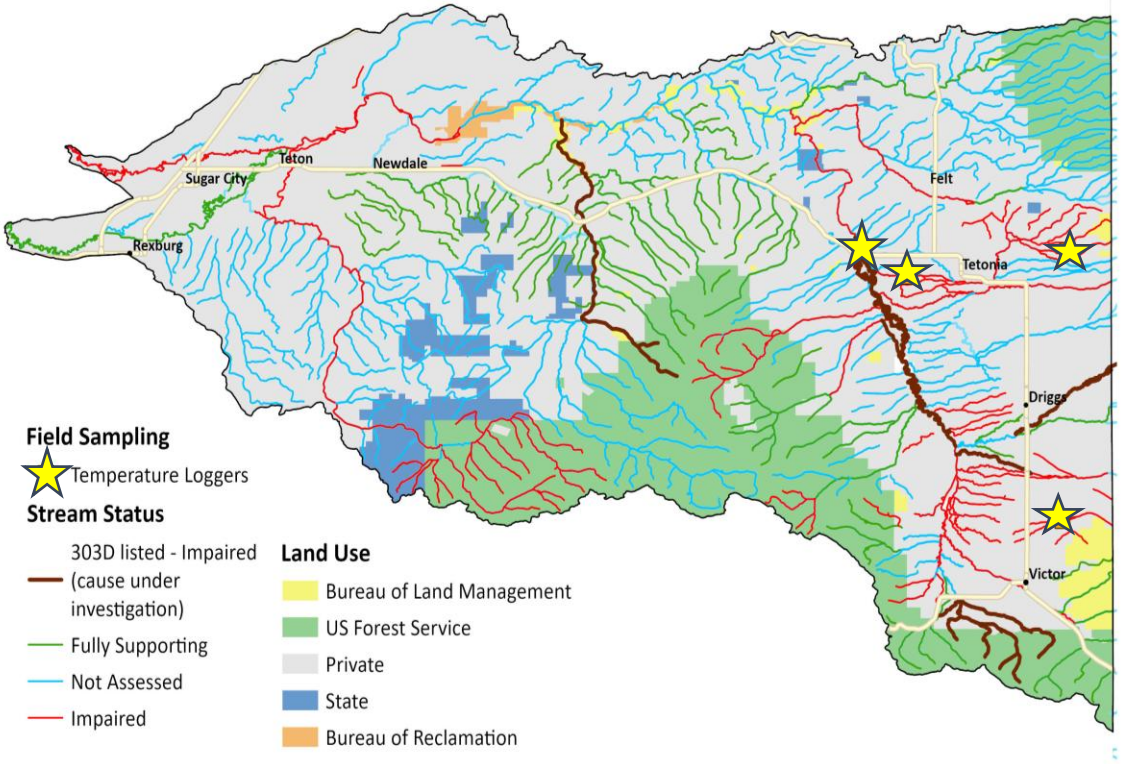
Temperature Monitoring

2024

- 3 sites
- 2 in Spring Creek and 1 in Fox Creek

2025-2026

- 1 site at Harrop's Bridge

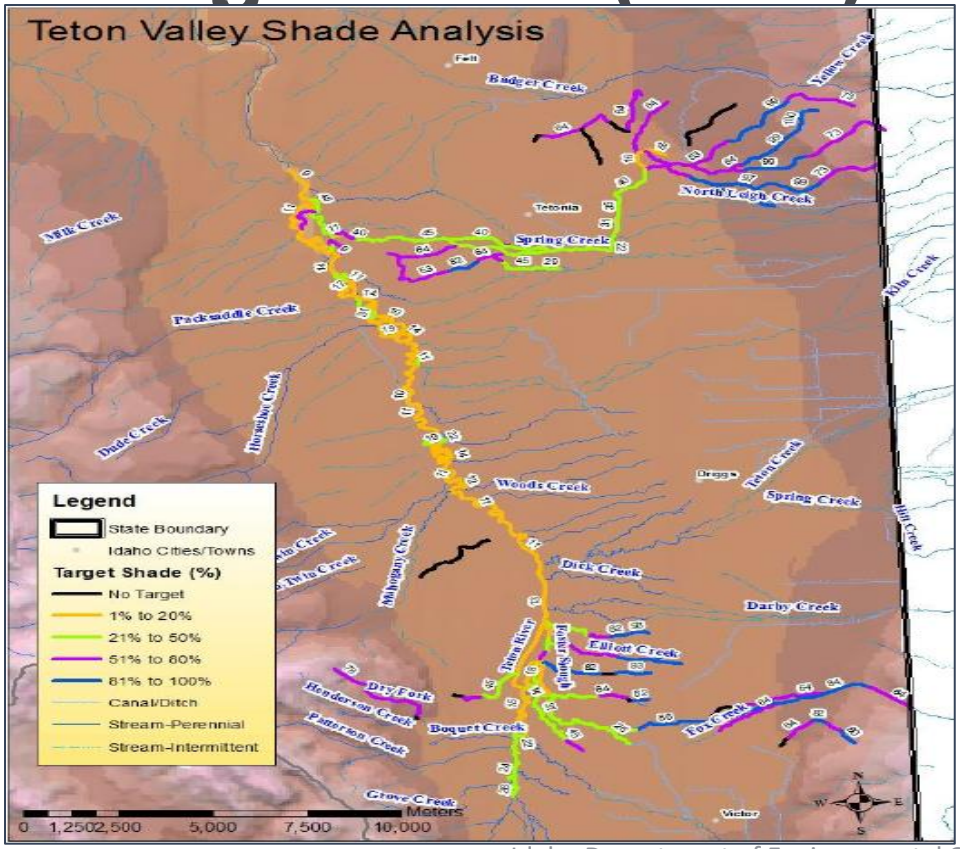


Temperature Trends

- Are they: Improving, Static, Declining
- Hard to compare!
- Potential Natural Vegetation (solar loads) to assign the load allocations

Potential Natural Vegetation (PNV)

Stream Name	Reduction Required (%)
Teton River	14%
Teton River	27%
Teton River Tributaries	22%
Teton River	65%
Teton River	29%
Fox Creek	35%
Fox Creek	0%
Spring Creek	11%
Spring Creek	43%
Spring Creek	15%



Next Steps

Finalize the 5-Year Review

Develop bacteria and temperature TMDLs

Develop temperature trends

Continue reviewing and analyzing data from FTR and other organizations

Questions?

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

Cherie Windsor

Resources

Links

- Total Maximum Daily Loads - Idaho Department of Environmental Quality
- Idaho DEQ FINAL 2024 Integrated Report
- Watershed Story Maps – Idaho Water Resources Research Institute (IWRRI)
- How's My Waterway | US EPA

Nutrient Load Allocations

Assessment Unit	WQLS	Parameter	Year	Current Load (pounds per year)	Load Capacity (pounds per year)	Load Reduction Required (pounds per year)	Percent Reduction Required (%)	Trends: Improving, Static, or Declining
North Fork Teton River, ID17040204SK002_05	2113	Nitrogen	2003	214,853	178,603	36,250	17	Improving
			2024-2025	68,606	69,585	-979	0	
		Phosphorus	2003	200,529	59,534	140,995	70	Improving
			2024-2025	6,667	23,195	-16,528	0	
Teton River - Teton Dam to Teton River Forks, ID17040204SK003_05	2119	Nitrogen	2003	NA	NA	NA	NA	NA
			2024-2025	1,019,255	415,917	603,337	59	
		Phosphorus	2003	NA	NA	NA	NA	
			2024-2025	30,244	138,639	-108,395	0	
Upper Teton River, Highway 33 to Bitch Creek, ID17040204SK014_04 ID17040204SK015_04 ID17040204SK016_04	2116	Nitrogen	2003	494,270	305,645	188,625	38	Declining
			2024-2025	1,027,094	393,077	634,018	62	
		Phosphorus	2003	461,319	101,882	359,437	78	Improving
			2024-2025	28,813	131,026	-102,212	0	
Moody Creek, ID17040204SK005_04	2119	Nitrogen	2003 (lbs/day)	316	106	213	66	Improving
			2024-2025 (ave lbs/day)	19	60	-40	0	
		Phosphorus	2003 (lbs/day)	87	36	52	59	Improving
			2024-2025 (ave lbs/day)	13	20	-7	0	
* North Fork Teton River, Teton River - Teton Dam to Teton River Forks, ID17040204SK002_05, ID17040204SK003_05	2113 and 2119	Nitrogen	2003	214,853	178,603	36,250	17	Declining
			2024-2025	1,087,861	485,502	602,358	55	
		Phosphorus	2003	200,529	59,534	140,995	70	Improving
			2024-2025	36,911	161,834	-124,923	0	

Nutrient Data - Moose Creek

MOOSE CREEK (ID17040204SK039_02) Tributary Reference Site				
Date	Total Kjeldahl Nitrogen (mg/L)	Nitrogen, Nitrate, Nitrite (mg/L)	Total Phosphorus (mg/L)	Orthophosphate (mg/L)
6/12/2024	0.15	0.16	0.051	0.016
7/23/2024	0.05	0.056	0.017	0.014
8/27/2024	0.15	0.14	0.025	0.019
9/23/2024	0.05	0.14	0.024	0.02
10/28/2024	0.22	0.15	0.022	0.018
4/16/2025	0.05	0.16	0.021	0.016
5/7/2025	0.05	0.13	0.019	0.017
6/9/2025	0.11	0.14	0.025	0.016
7/15/2025	0.12	0.16	0.022	0.016
8/11/2025	0.11	0.13	0.018	0.015
9/3/2025	0.05	0.15	0.02	0.018
10/7/2025	0.05	0.14	0.021	0.017

Nutrient Data – Teton River

TETON RIVER (ID17040204SK017_04) Main Stem Reference Site				
Date	**Total Kjeldahl Nitrogen (mg/L)**	**Nitrogen, Nitrate, Nitrite (mg/L)**	**Total Phosphorus (mg/L)**	**Orthophosphate (mg/L)**
6/12/2024	0.31	0.0035	0.016	0.006
7/23/2024	0.29	0.67	0.016	0.0049
8/27/2024	0.26	0.72	0.013	0.003
9/23/2024	0.2	0.5	0.0091	0.003
10/28/2024	0.31	0.81	0.0063	0.002
4/16/2025	0.31	0.53	0.04	0.014
5/7/2025	0.38	0.35	0.032	0.009
6/9/2025	0.28	0.11	0.033	0.016
7/15/2025	0.31	0.74	0.012	0.0049
8/11/2025	0.42	0.84	0.012	0.0049
9/3/2025	0.27	0.61	0.012	0.0049
10/6/2025	0.24	0.67	0.01	0.0049

Nutrient Data – Teton River Felt Dam

TETON RIVER - FELT DAM (ID17040204SK014_04)				
Date	Total Kjeldahl Nitrogen (mg/L)	Nitrogen, Nitrate, Nitrite (mg/L)	Total Phosphorus (mg/L)	Orthophosphate (mg/L)
6/12/2024	0.3	0.076	0.029	0.006
7/23/2024	0.28	0.84	0.012	0.001
8/27/2024	0.23	0.92	0.011	0.003
9/23/2024	0.2	0.89	0.011	0.004
10/28/2024	0.36	0.87	0.0075	0.003
4/16/2025	0.38	0.77	0.04	0.018
5/7/2025	0.36	0.62	0.039	0.01
6/9/2025	0.3	0.37	0.041	0.01
7/15/2025	0.27	0.72	0.014	0.0049
8/11/2025	0.3	0.84	0.012	0.0049
9/3/2025	0.25	0.71	0.011	0.0049
10/6/2025	0.17	0.84	0.01	0.0049

Nutrient Data – Moody Creek

MOODY CREEK (ID17040204SK005_04)				
Date	Total Kjeldahl Nitrogen (mg/L)	Nitrogen, Nitrate, Nitrite (mg/L)	Total Phosphorus (mg/L)	Orthophosphate (mg/L)
6/12/2024	0.34	0.034	0.088	0.035
7/23/2024	0.2	0.11	0.049	0.029
8/27/2024	0.19	0.18	0.034	0.015
9/23/2024	0.12	0.15	0.026	0.015
10/28/2024	0.29	0.005	0.066	0.054
4/16/2025	0.38	0.16	0.087	0.018
5/7/2025	0.42	0.05	0.12	0.028
6/9/2025	0.26	0.0093	0.07	0.038
7/15/2025	0.23	0.018	0.061	0.035
8/11/2025	0.22	0.12	0.036	0.018
9/3/2025	0.19	0.029	0.03	0.016
10/6/2025	0.13	0.18	0.038	0.024

Nutrient Data – Teton River Teton Dam

TETON RIVER - TETON DAM (ID17040204SK003_05)				
Date	**Total Kjeldahl Nitrogen (mg/L)**	**Nitrogen, Nitrate, Nitrite (mg/L)**	**Total Phosphorus (mg/L)**	**Orthophosphate (mg/L)**
6/12/2024	0.33	0.21	0.041	0.012
7/23/2024	0.26	0.71	0.015	0.002
8/27/2024	0.24	0.97	0.014	0.006
9/23/2024	0.18	1.2	0.014	0.008
10/28/2024	0.37	0.97	0.0076	0.003
4/16/2025	0.31	0.5	0.029	0.0049
5/7/2025	0.29	0.28	0.04	0.01
6/9/2025	0.21	0.54	0.023	0.01
7/15/2025	0.28	0.56	0.017	0.005
8/11/2025	0.3	0.63	0.013	0.0049
9/3/2025	0.26	0.57	0.011	0.0049
10/6/2025	0.14	0.8	0.011	0.0049

Nutrient Data – North Fork Teton River

NORTH FORK TETON RIVER (ID17040204SK002_05)				
Date	**Total Kjeldahl Nitrogen (mg/L)**	**Nitrogen, Nitrate, Nitrite (mg/L)**	**Total Phosphorus (mg/L)**	**Orthophosphate (mg/L)**
6/12/2024	0.33	0.11	0.041	0.012
7/23/2024	0.24	0.13	0.019	0.004
8/27/2024	0.25	0.093	0.025	0.006
9/23/2024	0.17	0.64	0.018	0.004
10/28/2024	0.36	0.69	0.0097	0.003
4/16/2025	0.33	0.43	0.028	0.0049
5/7/2025	0.33	0.23	0.04	0.007
6/9/2025	0.24	0.2	0.024	0.006
7/15/2025	0.27	0.056	0.028	0.011
8/11/2025	0.36	0.083	0.026	0.016

Salmonid Spawning Temperatures – Then and Now

Assessment Unit Name	Assessment Unit Number	Salmonid Spawning Exceedances Then – 2003-2016		Salmonid Spawning Exceedances Now 2016-2026	
		13 C Max	9 C Ave	13 C Max	9 C Ave
Teton River	ID17040204SK020_04	57%	97%	16%	25%