

# Bear River Sediment TMDL



**BRIANNA FORREST**  
**Total Maximum Daily Load (TMDL) Program**  
**Wyoming Department of Environmental Quality**  
**Water Quality Division**



# Historic Photos (1970) – Courtesy of UCCD



**Bear River through the City of Evanston. Rock and willows provide streambank protection.**

# Historic Photos (1970) – Courtesy of UCCD



**Rip rap placement on the south bank of the Bear River.**

# Historic Photos (1970) – Courtesy of UCCD



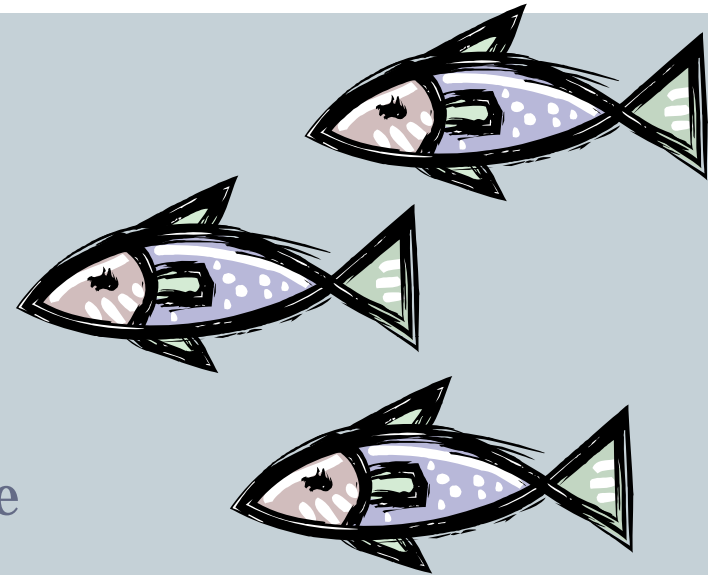
Picture shows gravel bars being deposited in Bear River. These conditions often are the cause of a river changing course.



# Bear River



- **Class 2AB Surface Water Body**
  - Fish & Aquatic Life
  - Drinking Water
  - Agriculture & Industry
  - Wildlife, Recreation, & Scenic Value



- **Classification is contained in the 2012 Integrated Report**
- **Defined in Chapter 1 of Wyoming's Water Quality Rules and Regulations**

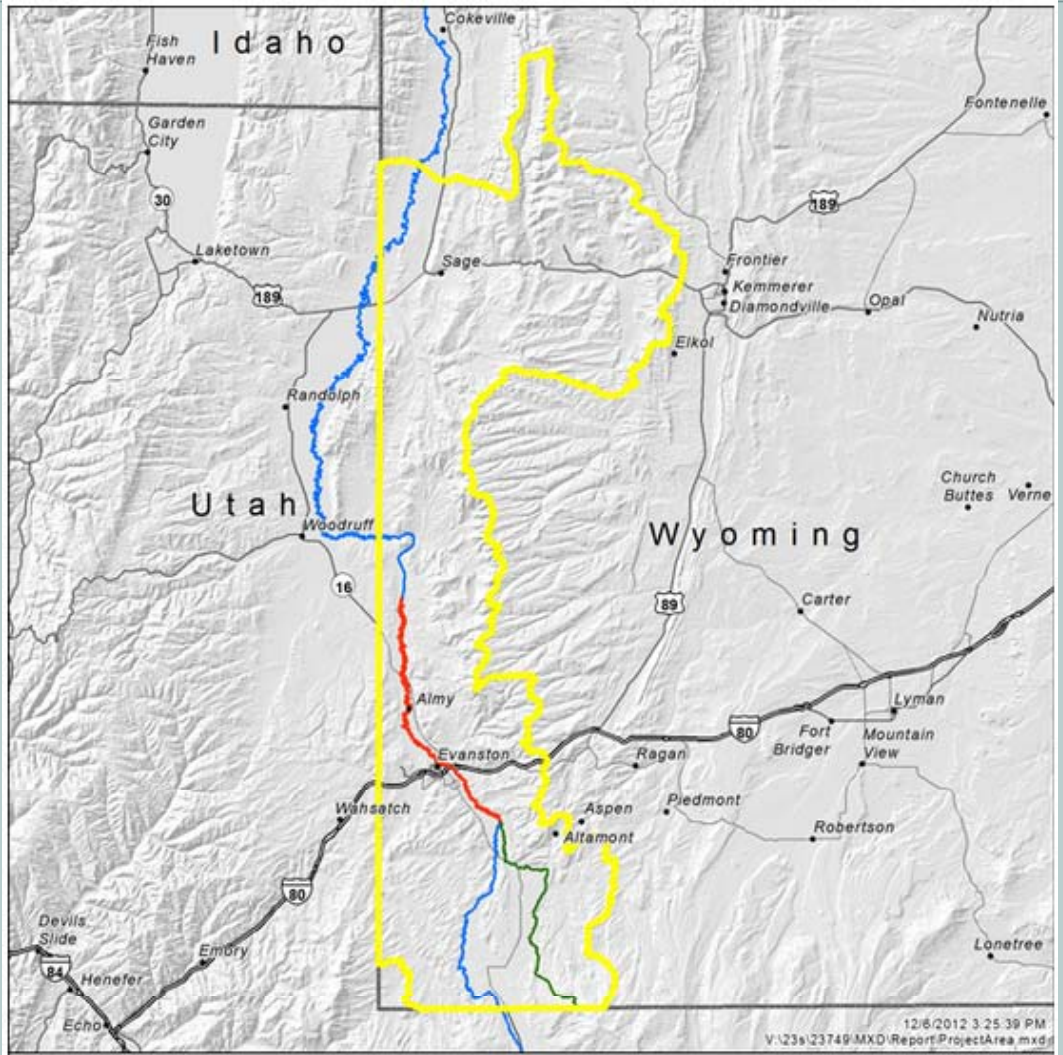
Available Online:

Wyoming DEQ → Water Quality Division → Watershed Protection

# Bear River §303(d) Listing



- 2002 Integrated Report
- From the confluence with **Woodruff Narrows Reservoir** upstream to the confluence with **Sulphur Creek**
  - 36.5 miles
- Impairment: Excess Sediment
  - Cold Water Fisheries
  - Aquatic Life other than Fish



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- Bear River
- Impaired Segment of the Bear River
- Sulphur Creek
- Upper Bear River Sub-basin (HUC 8)



Contains Privileged Information: Do Not Release



# What Lead to the 2002 Listing



- **Wyoming DEQ Beneficial Use Reconnaissance Monitoring and Assessment Report, 1998**
- **Measurable decline in water quality in downstream sample sites starting downstream of the confluence with Sulphur Creek**
  - Embeddedness – silt cover presence in the river substrate
  - Pool Quality – depth, substrate composition, overhead cover
  - Macroinvertebrate sampling – sensitive vs. tolerant species



# 1998 Monitoring by the Wyoming DEQ



**“Burton” Site**



**3.5 miles north of the Utah state line**

# 1998 Monitoring by the Wyoming DEQ



**“Field” Site**



**4 miles upstream of the Sulphur Creek Confluence**

# 1998 Monitoring by the Wyoming DEQ



## Sulphur Creek





# 1998 Monitoring by the Wyoming DEQ



**“State Park” Site**



**1 mile upstream of the I-80 crossing**



# 1998 Monitoring by the Wyoming DEQ



“Nixon” Site



3.5 miles north of the City of Evanston

# 1998 Monitoring by the Wyoming DEQ



**“Martin Ranch” Site**



**3.5 miles upstream of Woodruff Narrows Reservoir**

# Action



- **Upper Bear River Watershed Management Plan**
  - Upper Bear River Water Quality Steering Committee, September 2005
  - Identified possible urban and rural impacts to water quality
  - Laid out a plan to reduce possible contributions through community education addressing stormwater, solid waste disposal, land management, and recreation awareness
- **Water Quality Monitoring, Uinta County CD**
  - 5 sampling sites on Bear River
  - 2 sampling sites on Sulphur Creek

# The TMDL Process



- A TMDL is based on allowable pollutant **LOADS** to the surface water body
- **FLOW** is the key to translating water quality **CONCENTRATIONS** to **LOADS**

$$Load(mg) = \frac{mg}{L} \times L$$

- Flow is broken into flow regimes to account for variability in the water body system



# The TMDL Process



- **Evaluates pollutant sources to the waterbody**
  - Point sources – WYPDES permitting
  - Nonpoint sources – land management, development, & unsustainable use
- **For sediment, characterizes loading through:**
  - Source analysis, point & nonpoint
  - Watershed Assessment and River Stability for Sediment Supply (WARSSS)
  - Watershed modeling, allocation of flows into regimes

# TMDL Project Phases



- **WATERSHED CHARACTERIZATION**

- Research the history of the site
- Compile and analyze existing data
- Identify data gaps
- Generate maps from this data

- **TMDL ANALYSIS**

- Estimate existing source loads
- Calculate the allowable loading capacity of the waterbody
- Allocate loads between point & nonpoint sources
- Establish a margin of safety into the TMDL calculation

**TMDL calculations determine the permissible loading to the waterbody so that all water quality standards will be met.**

- **TMDL IMPLEMENTATION PLANNING**

- Projects to be implemented in the watershed that will reduce loading where it is needed most
- Identification of possible funding sources for such projects

# The TMDL Project



- **Initiated in Fall of 2012 – SWCA**
- **Technical Advisory Committee**
  - UCCD, City of Evanston, Town of Bear River, WDEQ, UDEQ, SEO, NRCS, BLM, USGS, USFS, & US Fish & Wildlife
- **First Public Meeting on January 23, 2013**
  - Introduction to the TMDL Process
  - Laid out the Public Involvement Plan
  - Identified data needs and sources
- **Second Public Meeting August 21, 2013**
  - Watershed Characterization
  - Project Maps

# The TMDL Project



- **Current Status**
  - Water Quality Data has been consolidated to a database
  - SEO Basin Spreadsheet Flow model is being adapted to the TMDL
  - Points of Diversion have been identified & mapped
  - Reconnaissance Level Assessment of the Rosgen WARSSS method has been completed
  - 6 segments identified for BEHI/NBS analysis
- **Past Work**
  - Data acquisition & mapping
  - TAC Meetings
  - Public Involvement Plan & Public Meeting



# The TMDL Project



- **Public Involvement**
  - Public Involvement Plan
  - E-mail subscription list on the project website
  - Public meetings at key project phases
- **Project Website:** <http://upperbearrivertmdl.com/>
  - Please sign-up for project e-mails on the website!



**Wyoming DEQ**

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