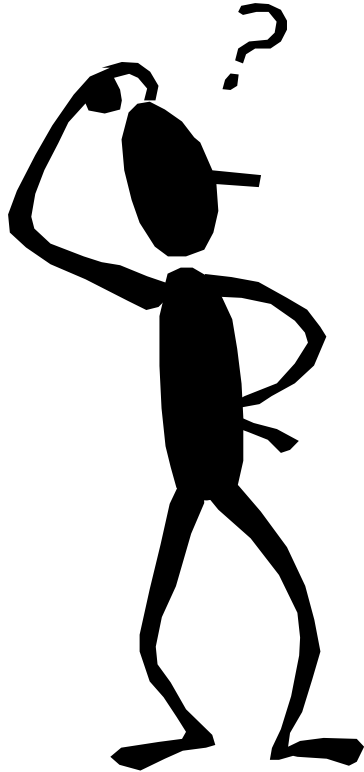


The image shows a lush, natural environment. In the foreground, a small, clear stream meanders through a vibrant green meadow. The meadow is filled with various grasses and small plants. In the background, a steep hillside is covered in a dense forest of tall, dark green evergreen trees. The sky is visible at the top, showing a mix of blue and white clouds. The overall scene is peaceful and scenic, typical of a mountain or forest landscape.

# **Water Quality Restoration Planning and Total Maximum Daily Loads**



# What's a TMDL?



A Number?

A Plan?

**YES**

## Total Maximum Daily Load:

A Number...

Amount of pollutant that a waterbody can receive from point, nonpoint & natural sources & still meet water quality standards.

A Plan...

Systematic approach to assessing water quality, determining if there is a problem, developing and implementing solutions.

# Regulatory Framework

- 1972 FEDERAL CLEAN WATER ACT
  - Montana Water Quality Standards
- 
- Sufficient & Credible Data/Beneficial Use Support Determinations
  - Impaired Streams – 303(d) list
- 
- State TMDL Law (MCA 75-5-703)
  - EPA Settlement Agreement/Lawsuit

# Again...What's a TMDL?

## A Problem-Solving Exercise



Sample/monitor streams (is there a problem?)

Determine the degree of the problem

Determine the source of the problem

Implement solutions/on-the-ground fixes

Monitor progress and success

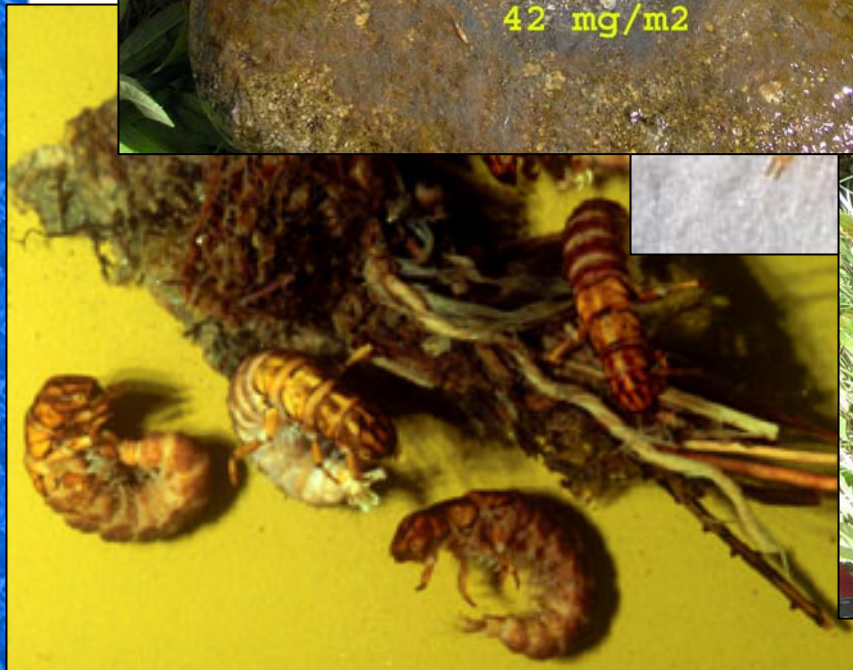


# Sample/Assess Streams





# Sample/Assess Streams



# Evaluate Data

## Water Quality Standards

Metals: Cu, Pb, As, Cd, Ni...  
Sediment: Suspended & Bedded Sediments  
Nutrients: Algae, Phosphorous, Nitrogen  
Fecal Coliform/e. coli, VOC, pH, etc...

## Reference Condition

Similar unimpaired streams/sites  
'Naturally Cooccurring' conditions  
Values/criteria from scientific literature  
Watershed modeling  
Statistical analysis  
Professional judgment

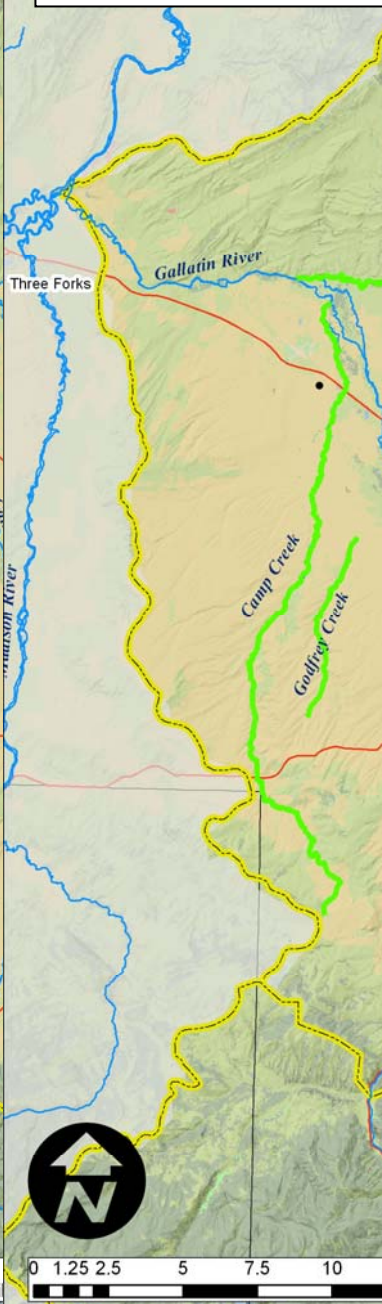
## Standard Assessment Methods – SCD/BUD



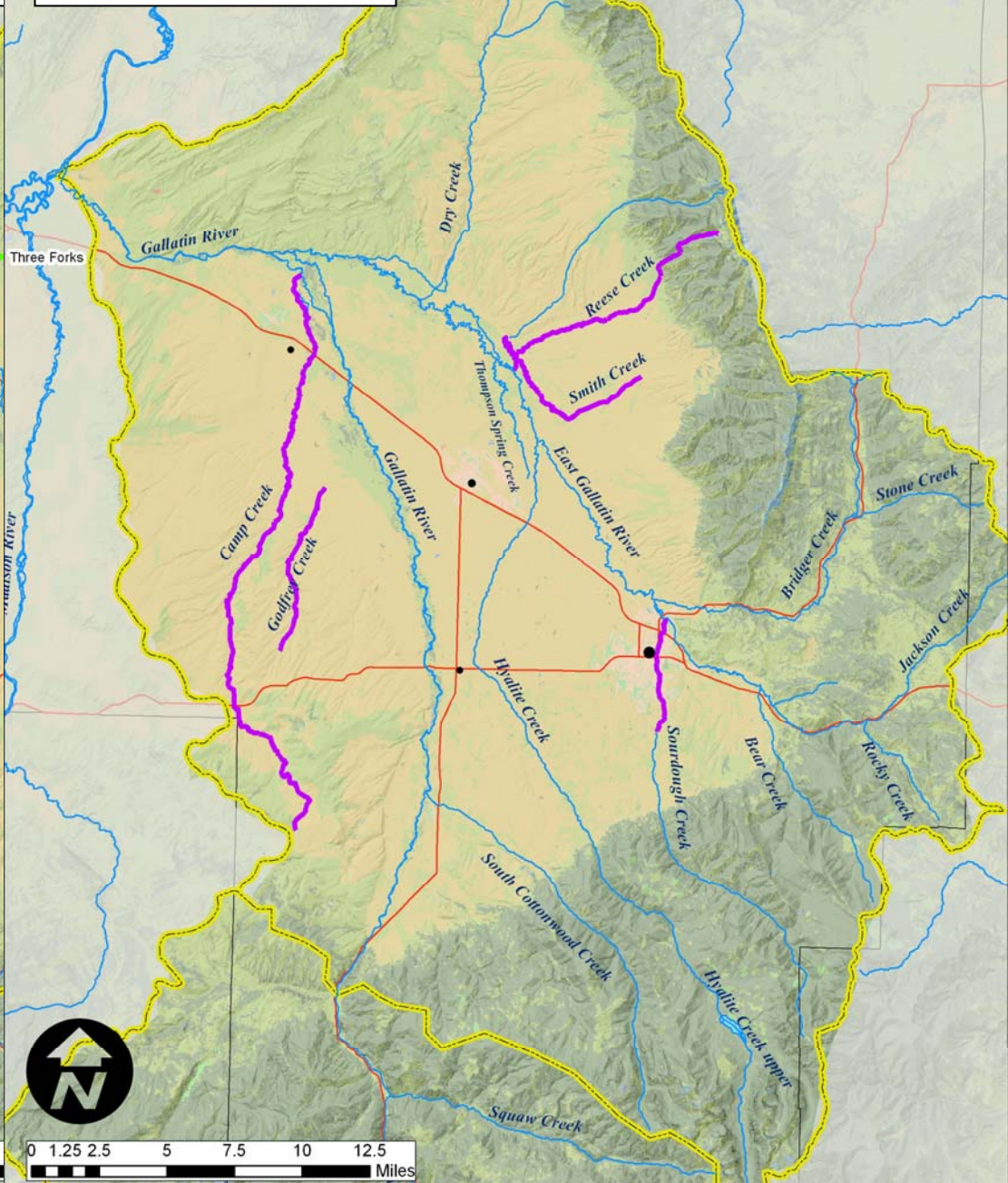
## Sediment Issues



## Nutrient Issues



## Pathogen Issues



# Prepare TMDLs

TMDLs are pollutant-specific (can calculate a *LOAD*)

Pollutants: copper, phosphorous, sediment, PCBs...

Pollution: habitat, flow alteration, riparian degradation

What a TMDL IS:

Plan to reduce pollutant loading to a level that meets state standards

A tool for use with other tools to provide a comprehensive planning and restoration effort to meet beneficial uses.

What a TMDL IS NOT:

Not a panacea/cure-all for watershed issues



# TMDL – Required Components

## Watershed Characterization

## Water Quality Standards & Impairment Status Review

- Define standards and water quality targets
- Evaluate individual streams and define pollutant issues

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## Pollutant Source Assessment

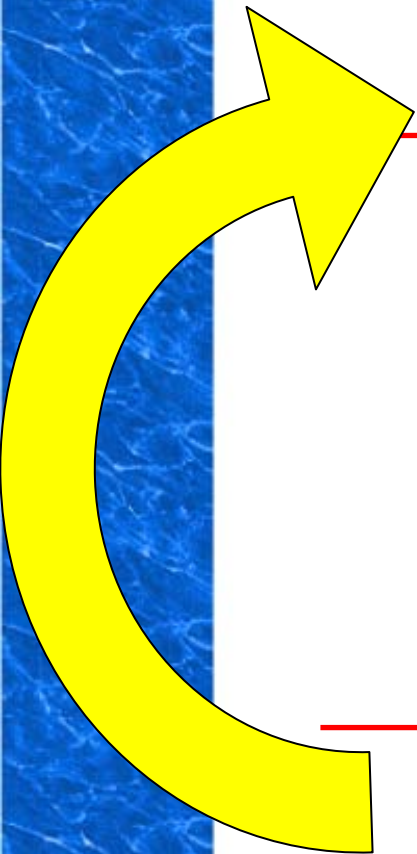
- Estimate existing pollutant loading from a variety of sources

## Establish Total Maximum Daily Loads & Allocations

- Defines maximum amount of pollutant allowed
- Defines pollutant reductions necessary to meet the TMDL and water quality targets
- Allocates loads to different sources

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## Monitoring, Restoration and *Adaptive Management*



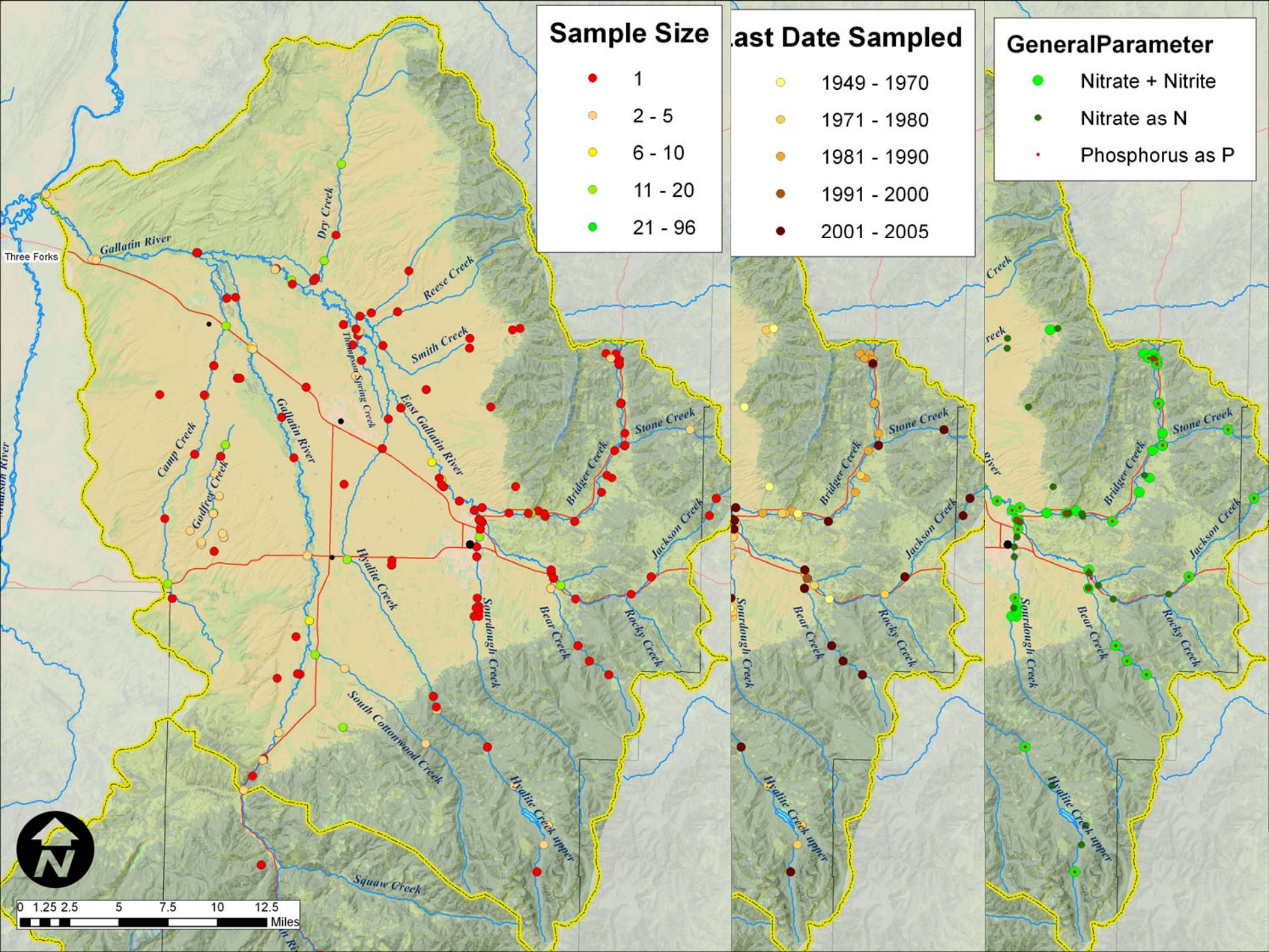
# Gallatin River TMDL Projects completed

- Watershed Characterization (complete)
- Existing data compilation, review and reporting (phase 1 complete)

## Gallatin River TMDL Projects 2008

- Aerial Photography Assessment (winter 2008)
- Existing data compilation, review and reporting (phase II – winter/spring 2008)
- Development of Sampling and Analysis Plans for on-the-ground data collection (nutrients - spring 2008)
- Implement SAPs & collect data (summer 2008)





# Summary....

- 16 Impaired streams in the Lower/East Gallatin watershed
- Federal and State TMDL 'Law' requires development of Total Maximum Daily Loads for 'pollutants of concern'.
- Montana DEQ is leading technical effort to assess, analyze, and develop TMDLs
- GGWC is leading local stakeholder & Public Involvement process.
- Activity planned for 2008 include aerial, SAP, nutrient sampling
- 2010-2011 target completion date.....LOTS to do....





# Contacts & Information

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