

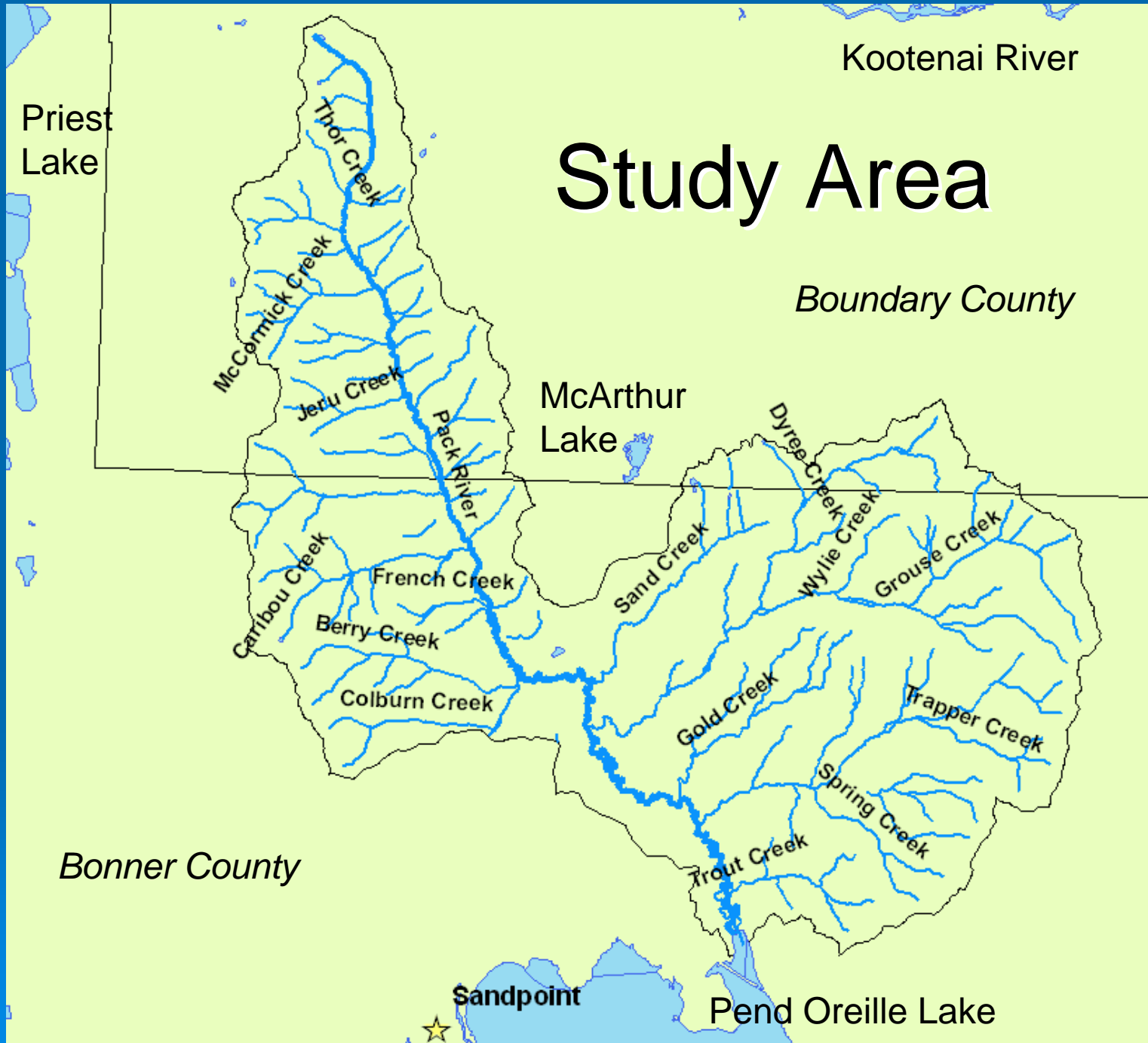
# Pack River Nutrient Target Selection Discussion

Presented to Pend Oreille Tributary  
Working Group

by Tyson Clyne



# Study Area



# Why do we care?

- Natural component of aquatic ecosystem.
- Nutrients in excess can cause a eutrophic (enriched) system.
- Nutrients in excess can cause increased algae, periphyton, and nuisance aquatic weed growth.



# Why do we care?

- Fish and other aquatic species lose available habitat due to dense mats of vegetation or algal blooms.
- When the excess plants decompose dissolved oxygen levels are reduced.
- Decreased dissolved oxygen can result in the loss of other aquatic organisms i.e. fish kills.
- Sources of excess nutrients: fertilizers, sewage systems, sediment containing nutrients, and organic matter.

# Idaho's Nutrient Criteria

- 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.
  - IDAPA 58.01.02.200.06

# Developing Numeric Target

- Steps taken to translate a narrative criteria into a numeric target
  - Literature review
  - Reference watershed
  - EPA recommendations

# Developing Numeric Target

## ➤ Literature review

- Pend Oreille Lake Nearshore TMDL
- Pack River Stream Channel Assessment “Golder Report”
- CWE assessments
- Other

# Developing Numeric Target

## ➤ Reference Watershed

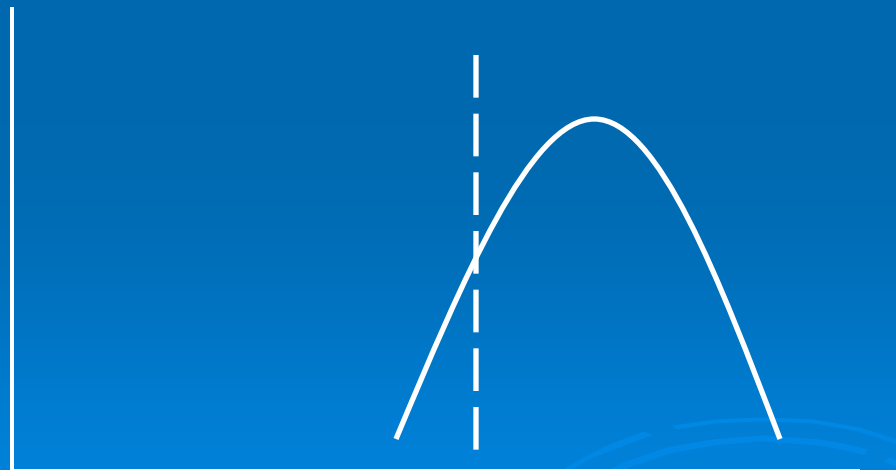
- Nothing with similar characteristics and associated data





# Developing Numeric Target

- EPA recommendations
  - 10  $\mu\text{g/L}$  based on upper 25<sup>th</sup> percentile of all sites



Higher Water  
Quality



Lower Water  
Quality

United States  
Environmental Protection  
Agency

Office of Water  
4304

EPA 822-B-00-015  
December 2000



## Ambient Water Quality Criteria Recommendations

Information Supporting the Development  
of State and Tribal Nutrient Criteria

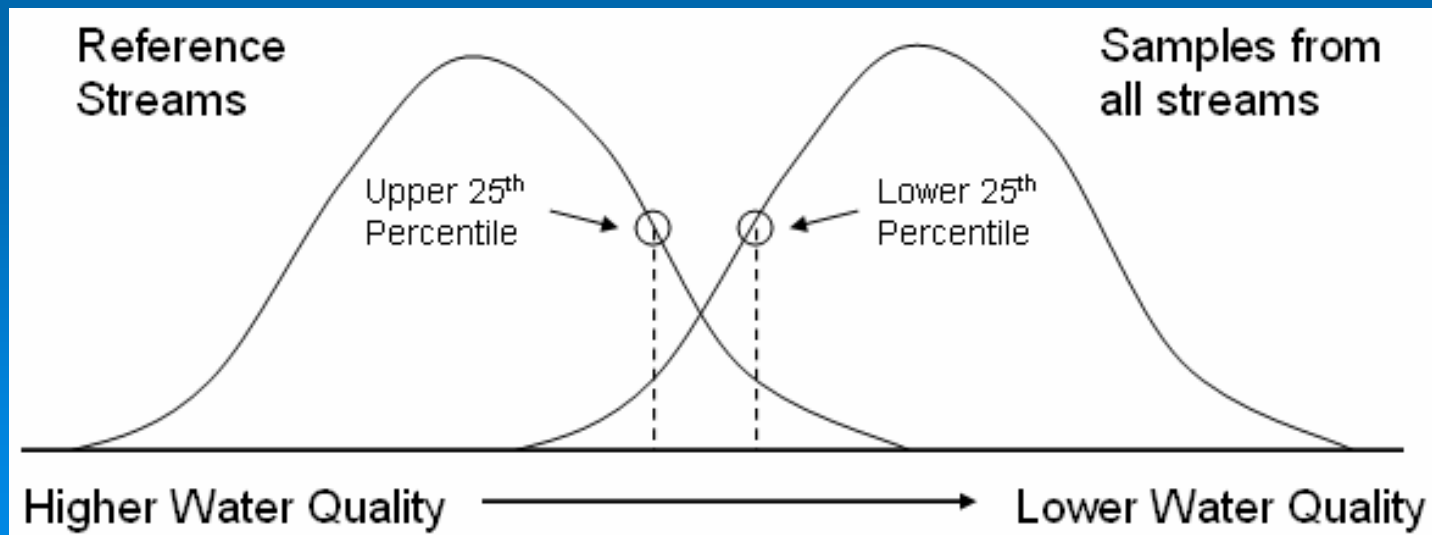
### Rivers and Streams in Nutrient Ecoregion II



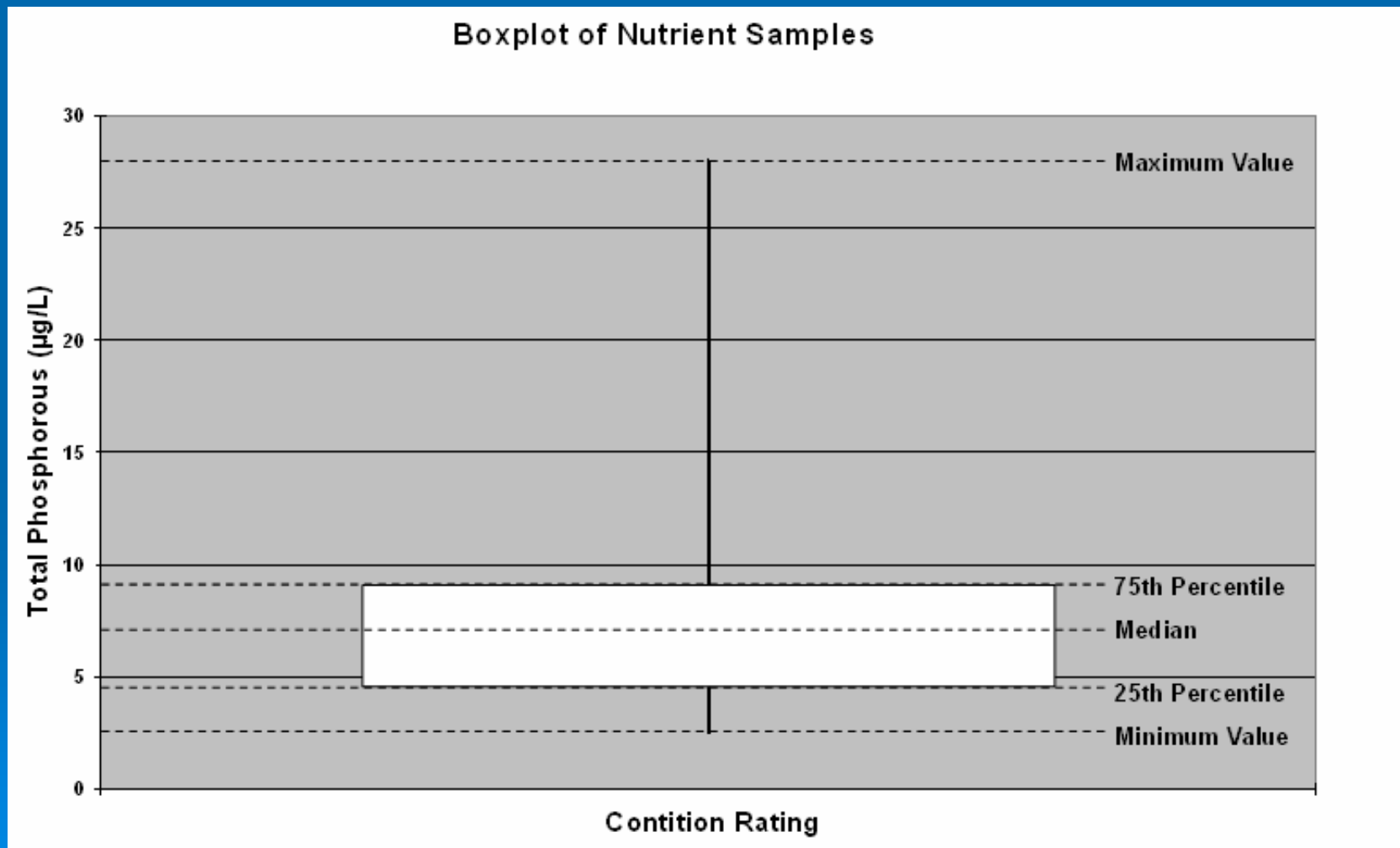
# Developing Numeric Target

## ➤ EPA recommendations

- Reference Sites in Northern Idaho compared
- 21 sites with TP data and passing WBAG II scores compared and 75<sup>th</sup> percentile evaluated



# Developing Numeric Target



# Results

- Pend Oreille Lake Nearshore TMDL
  - TP target = 9  $\mu\text{g/L}$
- EPA recommendation
  - TP 10  $\mu\text{g/L}$
- North Idaho data evaluation
  - TP 9  $\mu\text{g/L}$

Consistency between approaches suggests that 9  $\mu\text{g/L}$  is appropriate

# How does this target relate

## ➤ Converting mg/L to pounds per day

Load (pounds per day) = streamflow (cfs) x mg/L x 5.396

At Target 0.009 mg/L

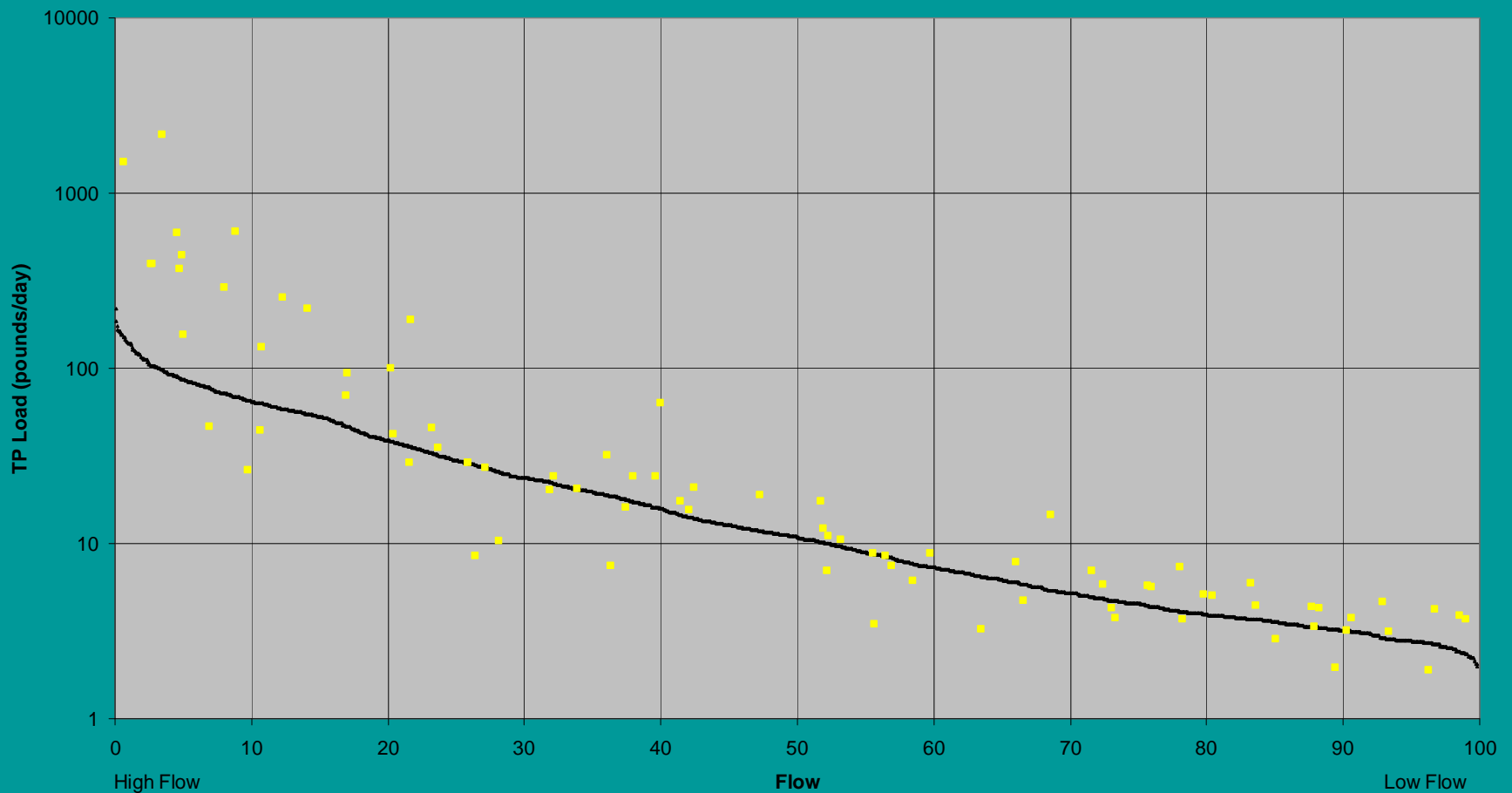
Pack River at 200 cfs = 9.7 pounds per day

Sampled at 0.016 mg/L

Pack River at 200 cfs = 17.3 pounds per day

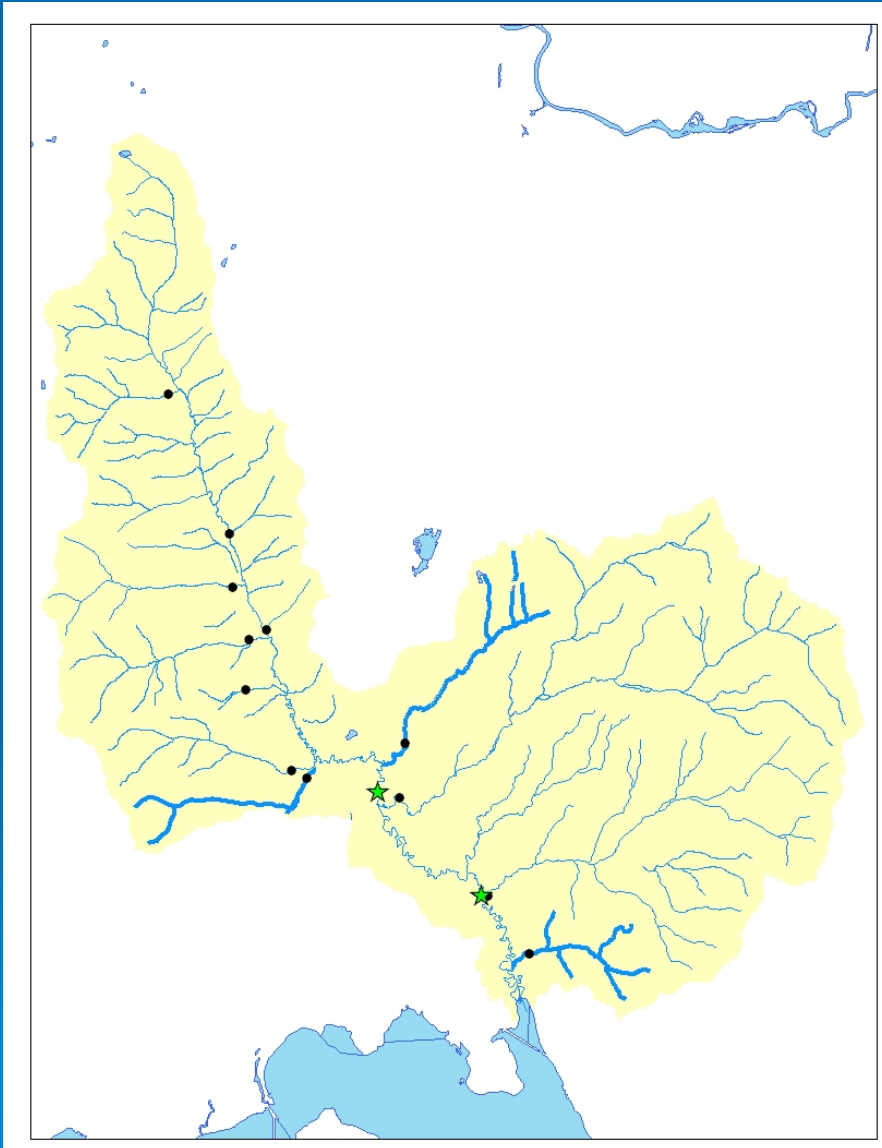
# How does this target relate

Pack River TP Load Duration Curve with Grab Samples at USGS Gage Station 12392390, Pack River above Rapid Lightning Confluence 1988-1993



Stream Name	Sample ID	Date	Units	Total N	Total P
Berry Creek	06-PRWS-BC-01	8/9/2006	mg/L	<0.1	0.005
Berry Creek	06-PRWS-BC-01	8/23/2006	mg/L	<0.1	0.004
Caribou Creek	06-PRWS-CC-01	8/9/2006	mg/L	<0.1	0.004
Caribou Creek	06-PRWS-CC-01	8/23/2006	mg/L	<0.1	0.005
Colburn Creek	06-PRWS-CO-01	8/9/2006	mg/L	0.3	0.029
Colburn Creek	06-PRWS-CO-01	8/23/2006	mg/L	0.2	0.027
French Creek	06-PRWS-FG-01	8/9/2006	mg/L	<0.1	0.007
French Creek	06-PRWS-FG-01	8/23/2006	mg/L	<0.1	0.009
Grouse Creek	06-PRWS-GR-01	8/8/2006	mg/L	0.2	0.005
Grouse Creek	06-PRWS-GR-01	8/22/2006	mg/L	0.2	0.004
Hellroaring Creek	06-PRWS-HR-01	8/8/2006	mg/L	<0.1	0.005
Hellroaring Creek	06-PRWS-HR-01	8/23/2006	mg/L	<0.1	0.006
McCormick Creek	06-PRWS-MC-01	8/9/2006	mg/L	<0.1	0.002
McCormick Creek	06-PRWS-MC-01	8/23/2006	mg/L	<0.1	0.003
Pack River Above Rapid Lightning Creek	06-PRWS-PR-01	8/8/2006	mg/L	<0.1	0.011
Pack River Above Rapid Lightning Creek	06-PRWS-PR-01	8/22/2006	mg/L	<0.1	0.016
Pack River at Colburn Road	06-PRWS-PR-02	8/8/2006	mg/L	<0.1	0.017
Pack River at Colburn Road	06-PRWS-PR-02	8/22/2006	mg/L	<0.1	0.015
Pack River at Edna	06-PRWS-PR-03	8/9/2006	mg/L	<0.1	0.005
Pack River at Edna	06-PRWS-PR-03	8/23/2006	mg/L	<0.1	0.005
Pack River near Martin Creek	06-PRWS-PR-04	8/9/2006	mg/L	<0.1	0.004
Pack River near Martin Creek	06-PRWS-PR-04	8/23/2006	mg/L	<0.1	0.004
Rapid Lightning Creek	06-PRWS-RL-01	8/8/2006	mg/L	<0.1	0.008
Rapid Lightning Creek	06-PRWS-RL-01	8/22/2006	mg/L	<0.1	0.008
Sand Creek	06-PRWS-SC-01	8/8/2006	mg/L	0.2	0.026
Sand Creek	06-PRWS-SC-01	8/22/2006	mg/L	0.1	0.024
Trout Creek	06-PRWS-TC-01	8/8/2006	mg/L	<0.1	0.011
Trout Creek	06-PRWS-TC-01	8/22/2006	mg/L	<0.1	0.014

# TP Samples above 9 $\mu\text{g}/\text{L}$



- Colburn Creek
- Sand Creek
- Trout Creek
- Pack River above Rapid Lightning
- Pack River at Colburn Road



# Discussion

