

# Reaching Your AMD Restoration Goals Through Planning and Prioritization

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**HedinEnvironmental**

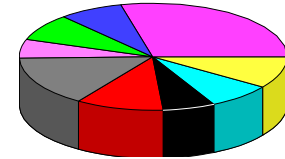


# Why You Need Them

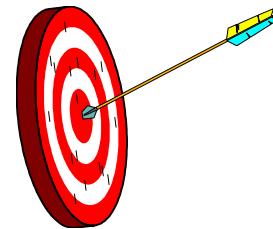
- Goals
  - Dream big
  - Prioritize projects logically
  - Measure success
  - Required by funding agencies
- List of Priority Projects
  - Charts a course
  - Allows quick action and decisions
  - Required by funding agencies

# Let's Work Backwards

1. Compile a good data set



2. Define watershed goals



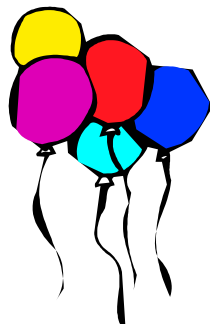
3. Make a list of priority projects



4. Complete projects by priority



5. All Watershed Goals are Met





# Possible Goals

- **Remove loading**
- **Recover stream miles**
- Focus on one area/tributary
- Focus on water quality at one point
- Gain momentum and publicity
- Form and foster partnerships
- Promote AMD research
- Improve accessibility to stream
- **And many more unique to watershed.....**



# Additional Factors

- Multiple Pollutants
  - Iron, Aluminum, Acidity
  - Non-AMD problems (sediment, sewage)
- Many landowners/stakeholders
  - Gaining consensus is important
  - Some landowners might not allow access
- Likelihood of funding and success



# Myths About Goals/Priorities



You can only have one goal

- Multiple goals listed in order of importance
- Short-term and long-term goals
- Goals that don't involve water quality



Priorities must be followed exactly

- Some groups use categories (high/medium/low)
- Some landowners might not allow access
- Some projects might fit with certain grant programs



Making trade-offs means someone always loses

- Win/win goals are possible in all cases
- The long-term view

# Pollution Loading

- Compare apples to apples
- Usually expressed in pounds per day (ppd)

Loading = Concentration X Flow

How Much = Quality X Quantity

1,000 mg/L  
at 10 gpm =

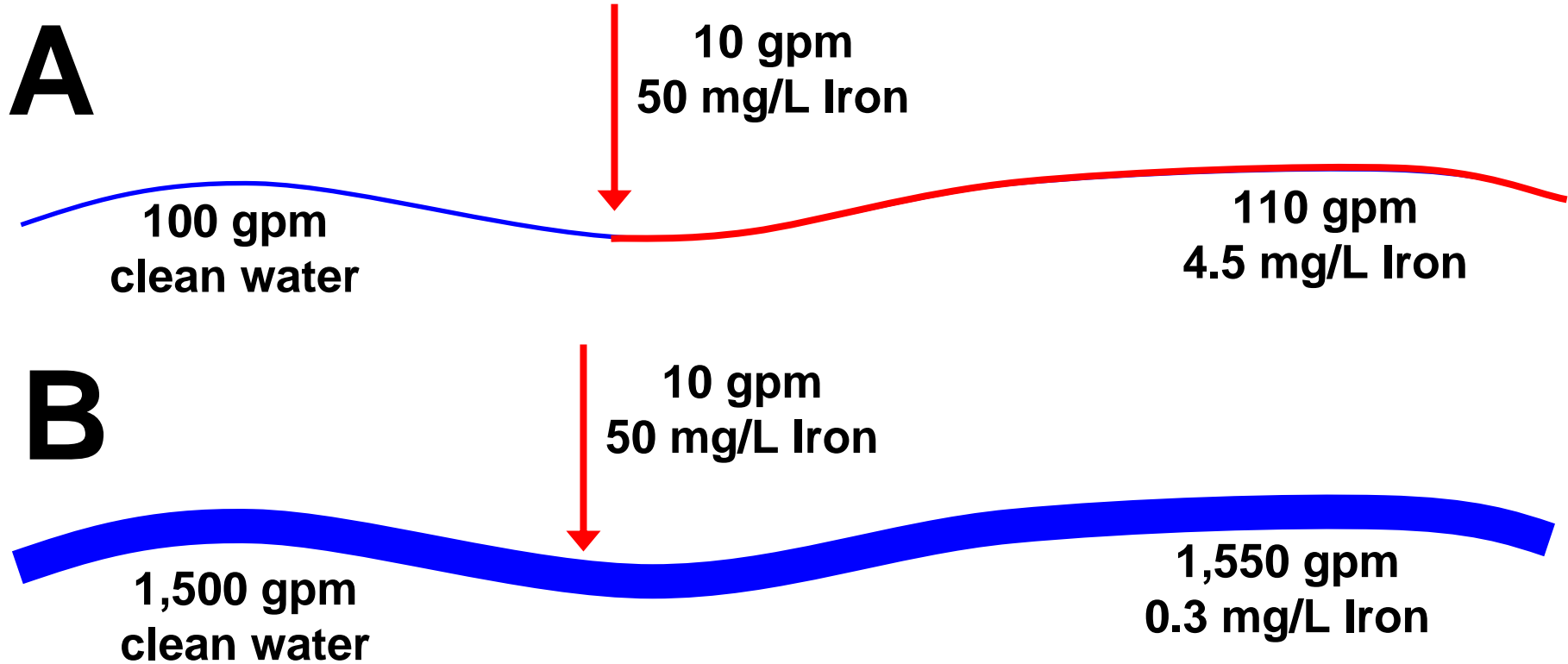
**120 pounds per day**



10 mg/L at  
1,000 gpm =

**120 pounds per day**

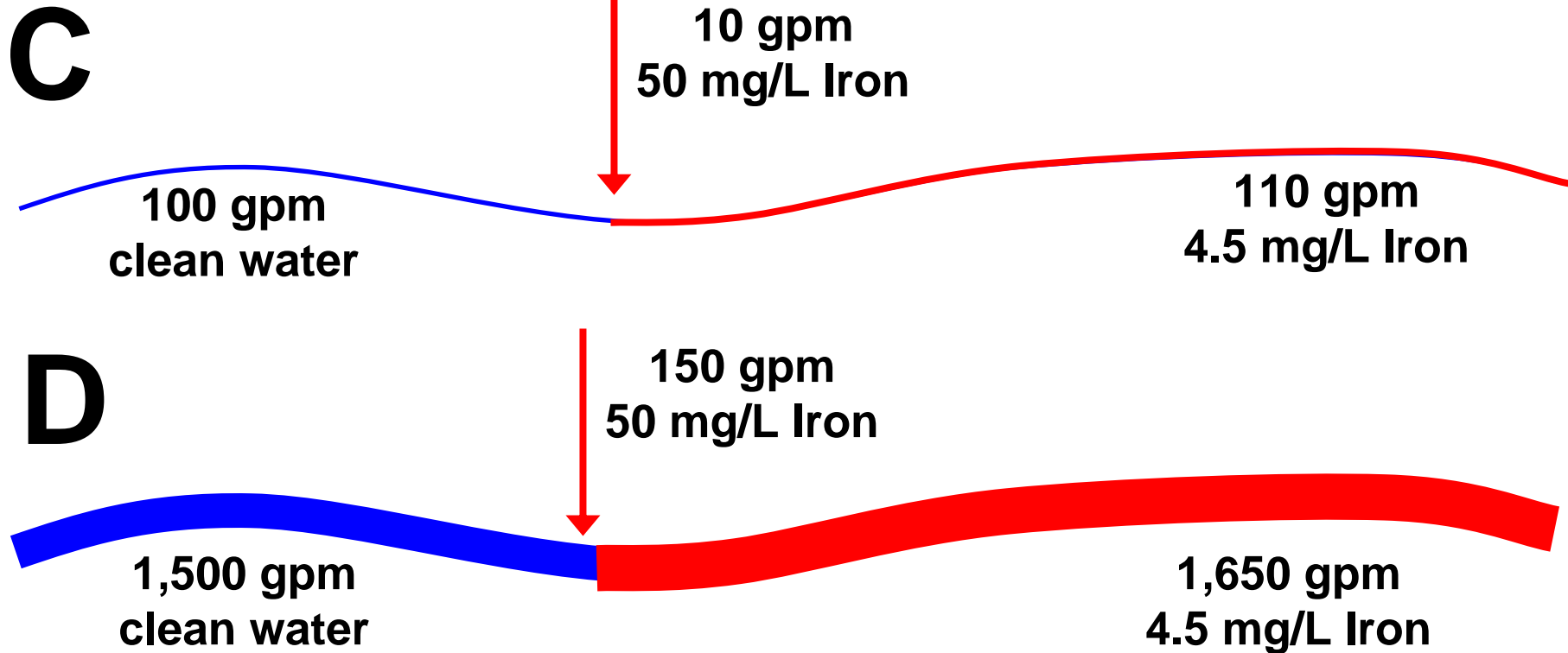
# Dilution is the Solution to Pollution



- The loadings are the same, the impacts are different
- If your main goal is to recover stream miles, choose A
- If your main goal is to remove loading, they are equal



# More About Dilution



- The loadings are different, the impacts are the same
- If your main goal is stream miles, they are equal
- If your main goal is to remove loading, choose D



# TMDL Moment

TMDL = Total Maximum Daily Load  
TMDL  $\neq$  Watershed Restoration Plan

- + The goal is to meet stream standards at all points
- + Provides a statistical data analysis
- + Can open doors to additional funding
- Other goals are not considered
- Projects are not prioritized
- A list of what should be done – not necessarily what can be done



# Case Study: Little Elk Run

- Punxsutawney, Jefferson County
- Tributary to Elk Run, Tributary to Mahoning Creek
- 3.5 square miles (2,270 acres)
- 9 discharges identified and sampled
  
- LERMD20 was the stand-out
  - 74% of acidity loading
  - 84% of iron loading
  - 64% of aluminum loading

# Results

- GG Funding obtained
- Passive system constructed in 2003/04
- Mouth of stream now net alkaline (was pH 4.5, net acid 28 mg/L)
- It is possible no other systems are necessary





# Lessons Learned, Little Elk Run

- Sometimes, things are straight forward
- No complicated decision matrix needed
- Good data don't lie
- Smaller watersheds are “easier” to prioritize



# Case Study: Beech Creek

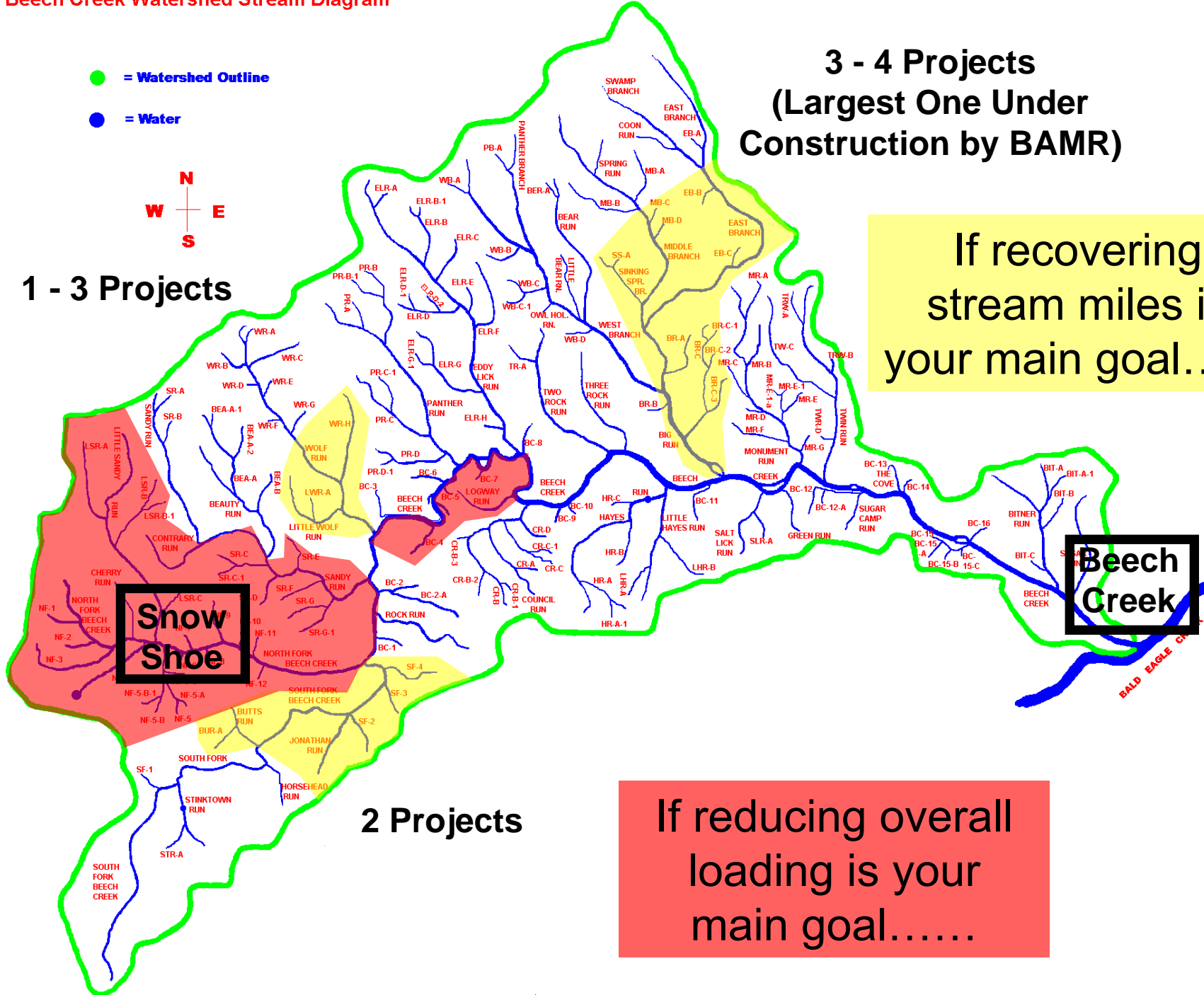
- Centre and Clinton Counties
- Tributary to Bald Eagle Creek
- 171 square miles (50 X bigger than LER)
- Over 50 medium – large discharges identified
- Some tributaries: moderate pollution from a few sources
- Some tributaries: extreme pollution from many sources
- Main stem of Beech Creek very polluted

# Beech Creek Watershed Stream Diagram

- = Watershed Outline
- = Water



1 - 3 Projects



3 - 4 Projects  
(Largest One Under Construction by BAMR)

If recovering stream miles is your main goal.....

If reducing overall loading is your main goal.....





# The Main Decision

## “Easy” Streams

VERSUS

## Loading

- + A few projects would recover cold-water fishery stream miles
- + Success and measured results would build momentum
- Most stream segments lack access
- Little to no impact on main stem (Beech Creek residents don’t get “bang for the buck”)

- + Protection of Bald Eagle Creek
- + Effects seen in population centers sooner
- Some discharges not suited for passive treatment
- Many projects required before main stem/ stream mile improvements





# Lessons Learned, Beech

- Some watersheds require short-, medium-, and long-term goals
- Only the watershed group and stakeholders can set goals—consultants can only provide technical help.
- Stay tuned for more information about the restoration of Beech Creek!



# Summary Recommendations

- Get good data (in-stream and discharge)
- Sponsor a stake-holder discussion to gather everyone's "vision" for the future
- List all possible goals
- Gather consensus on the goals (3 – 5 main goals in order of importance)
- Use the goals to formulate a list of priority projects

**Can be simple or complicated depending upon watershed size, number of discharges, stakeholder desires, etc**

# Questions and Discussion



Kettle Creek  
Watershed Association



# What is AMD???



**No matter what you call it, it's bad news.**