

The Watershed Based Planning Approach

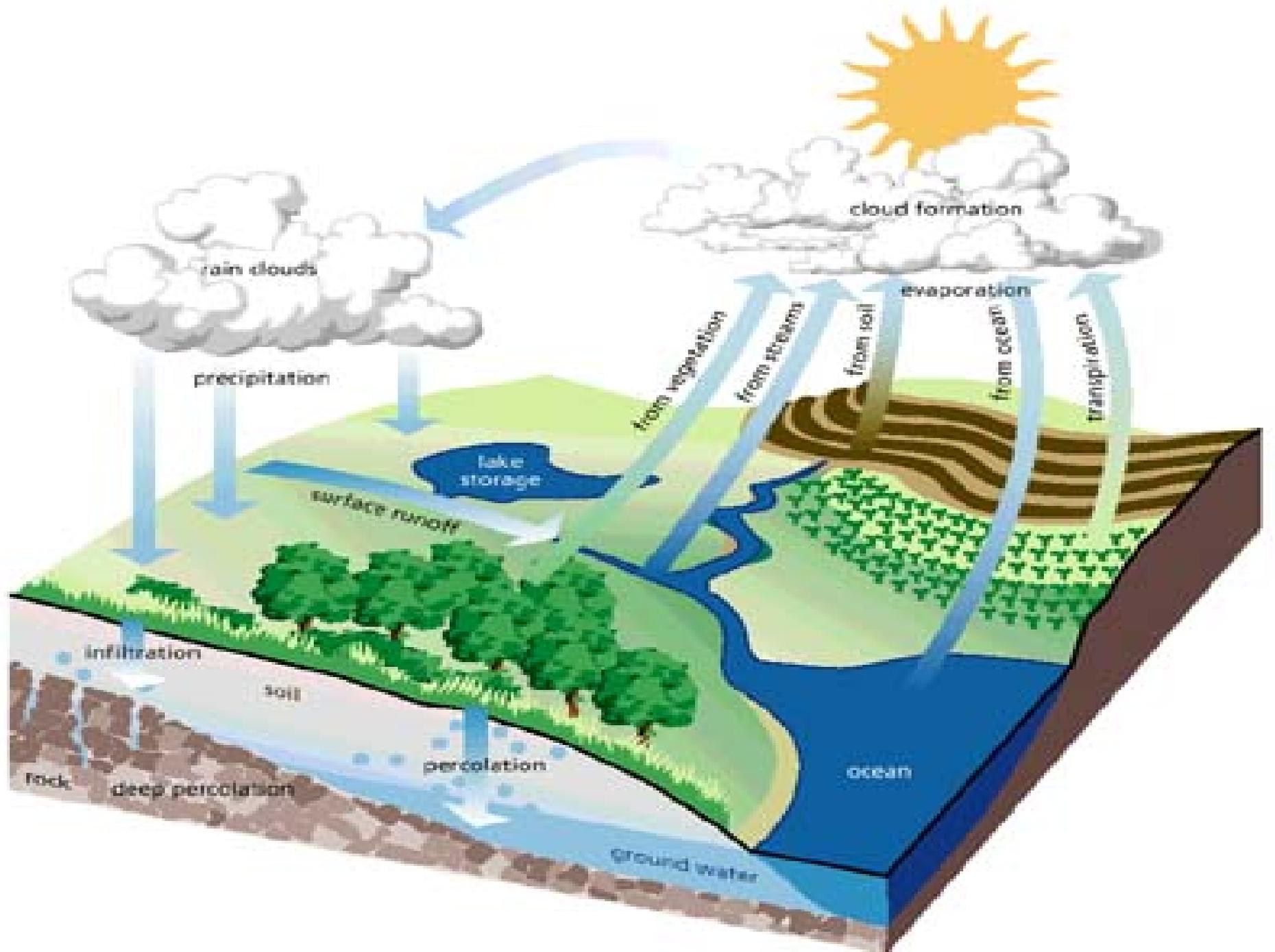
Thomas E Davenport

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- Tribal Training Session:
National Water Quality Monitoring Council
Conference
- Sheraton Downtown Hotel in Denver, CO
- Monday April 26th
- 8:00 am to 11:30 am

Watershed Management

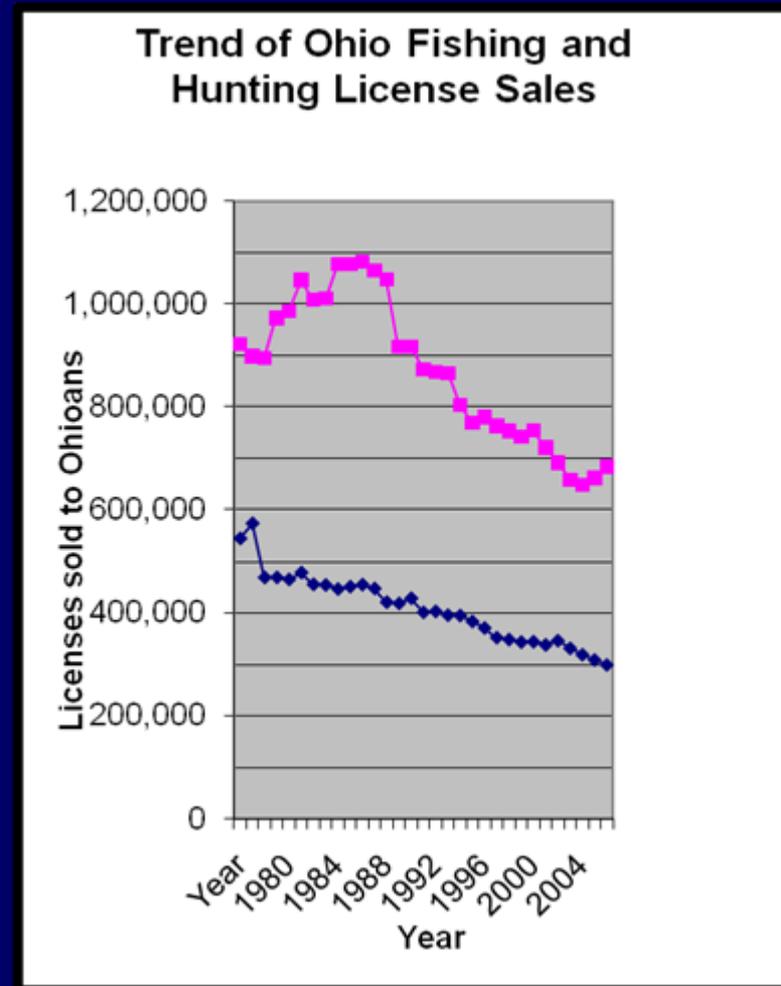
Moving beyond the Same Old Cheese







Participation trends in Conservation



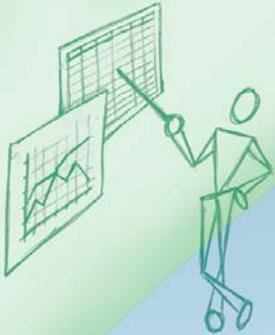
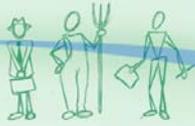
Something Needs to Change



From the Dilbert-2007 Calendar



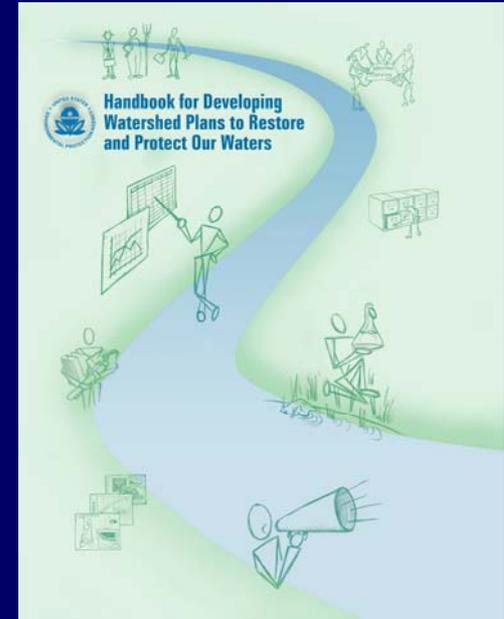
Handbook for Developing Watershed Plans to Restore and Protect Our Waters



Using EPA's *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*

Introduction

- Our hope is that this handbook will supplement existing guides
- Provides assistance in developing the necessary details of effective plans
- Serves as a starting point for an updateable document on planning across programs and levels of governance.



Value of Watershed Plan

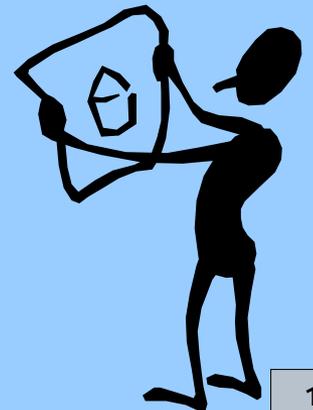
Establishes baseline of existing conditions.

Identifies specific problems.

Develops solutions to problems.

Identifies potential implementers and costs.

Provides framework for evaluation.



Additional benefits of effective watershed plans

A well drafted plan recognizes the need to address multiple problems in a watershed, such as:

- **Restoration & Physical Improvements**
- **Residential Nutrients**
- **Failing HSTS Units**
- **Stormwater Management & Urban NPS**

Section 319: Nine Elements

- a. Identify causes & sources of pollution
- b. Estimate load reductions expected
- c. Describe mgmt measures & targeted critical areas
- d. Estimate technical and financial assistance needed
- e. Develop education component
- f. Develop schedule
- g. Describe interim, measurable milestones
- h. Identify indicators to measure progress
- i. Develop a monitoring component



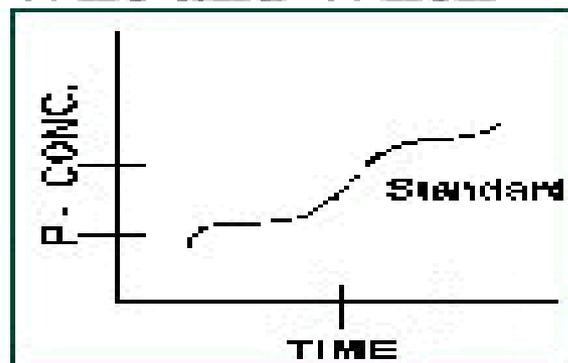
The nine elements work: why

- ◆ Quantifying pollutant sources to guide plan development
- ◆ Understanding what NPS management practices will achieve along with the point source controls
- ◆ Looking ahead to implementing and revising the watershed plan

(Watershed plans need to address more than the 9 elements – e.g. Protection, Drinking Water, Habitats, Fisheries, State Priorities permitted sources, solid waste, trading, etc.)

Watershed Management Plans Address Specific Restoration and Protection Actions. These Plans Document How, Who and When

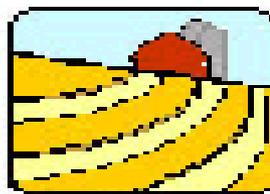
The problem(s)



The goal

Reduce phosphorus loading to meet standard

How,who,when



Farmers & agencies cost share BMP's target 80% coverage by 2001



Local & state cost-share upgrade of treatment plant construction assistance grant \$20 M by 2001



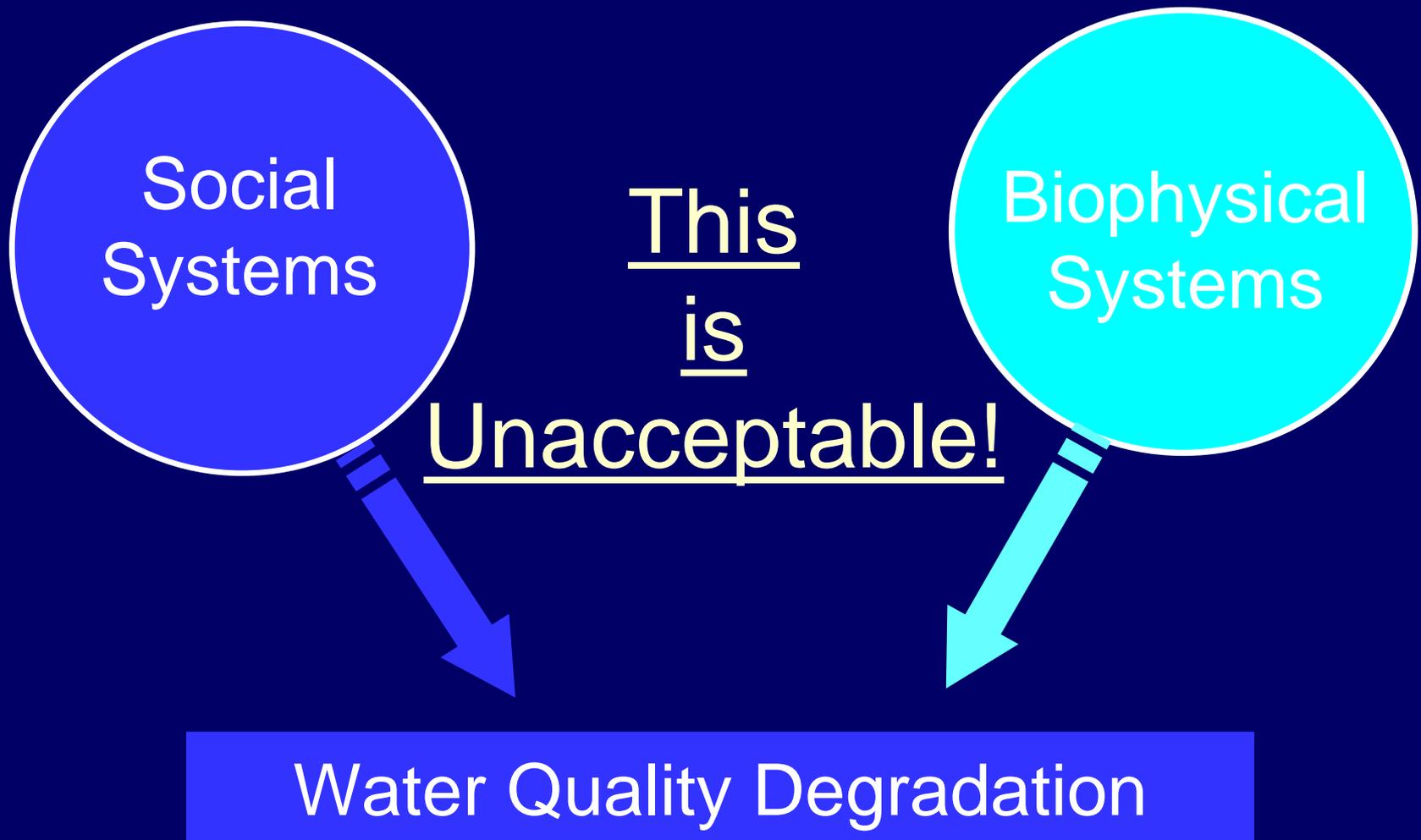
SET
GOALS

That solve real problems

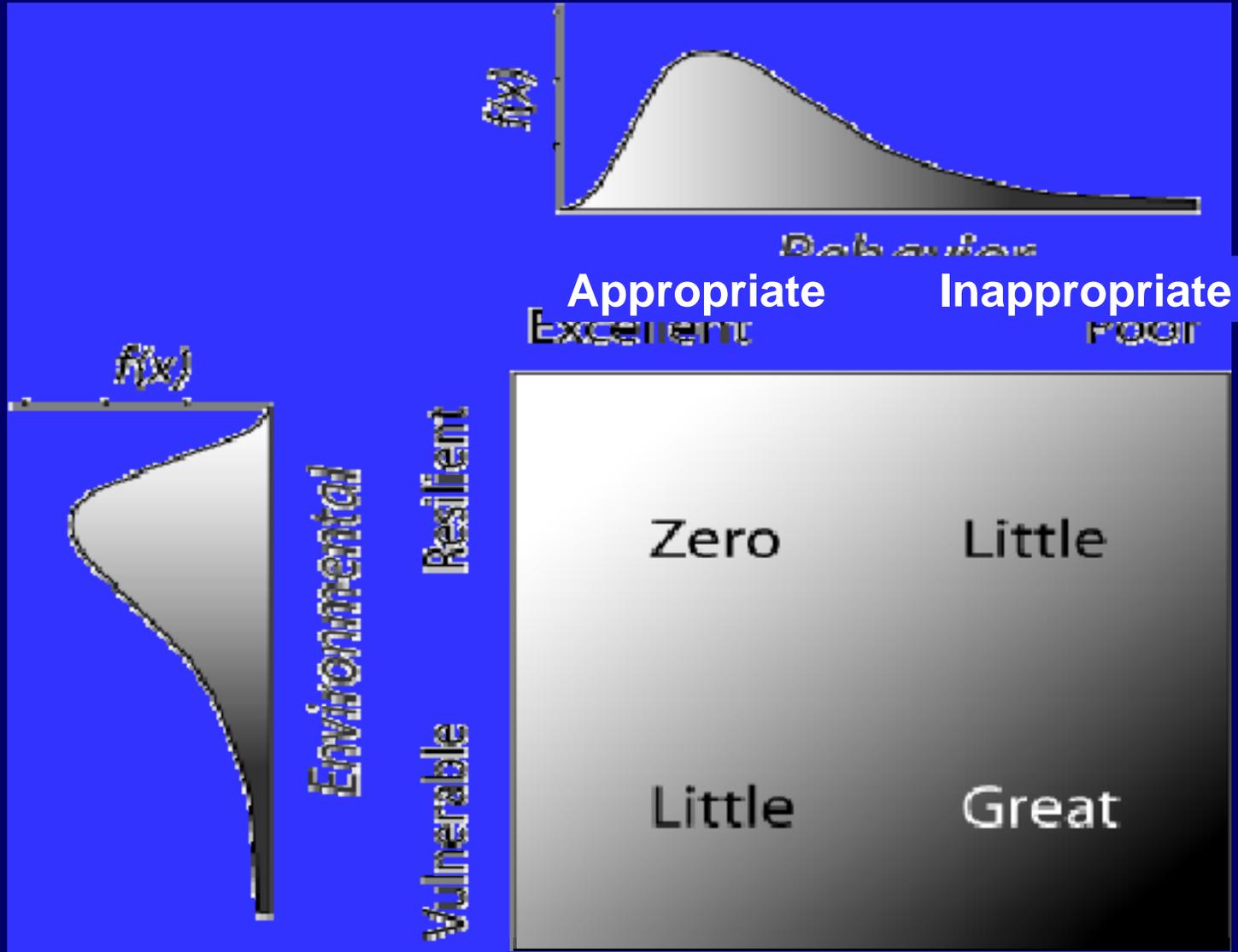
Treat the Right Problems with the Right Solutions in the Right Places

How do we get there?

Approaches to NPS Pollution

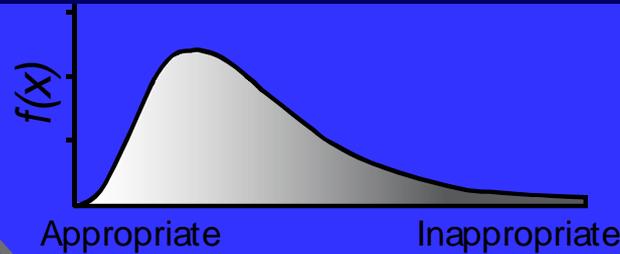


Disproportionality

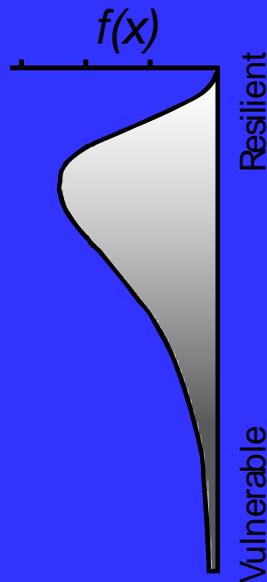


Disproportionality

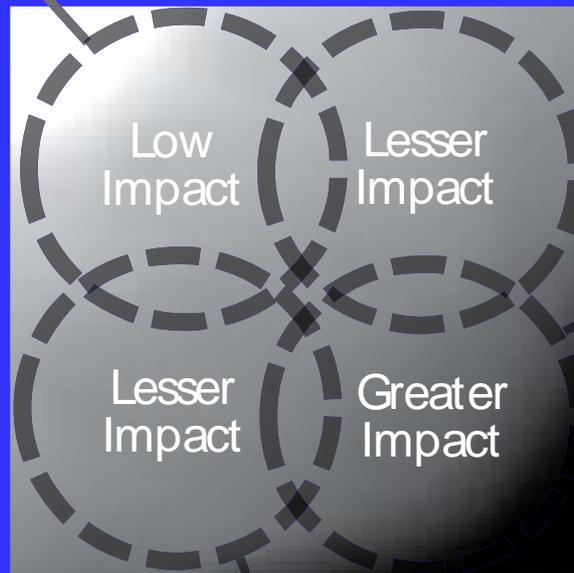
hydrologically-disconnected
(e.g., upland location)
minimal application of inputs
greater residue cover
(e.g., ridge or no tillage)
greater organic matter
fine-to-medium textured soils



Management



Biophysical

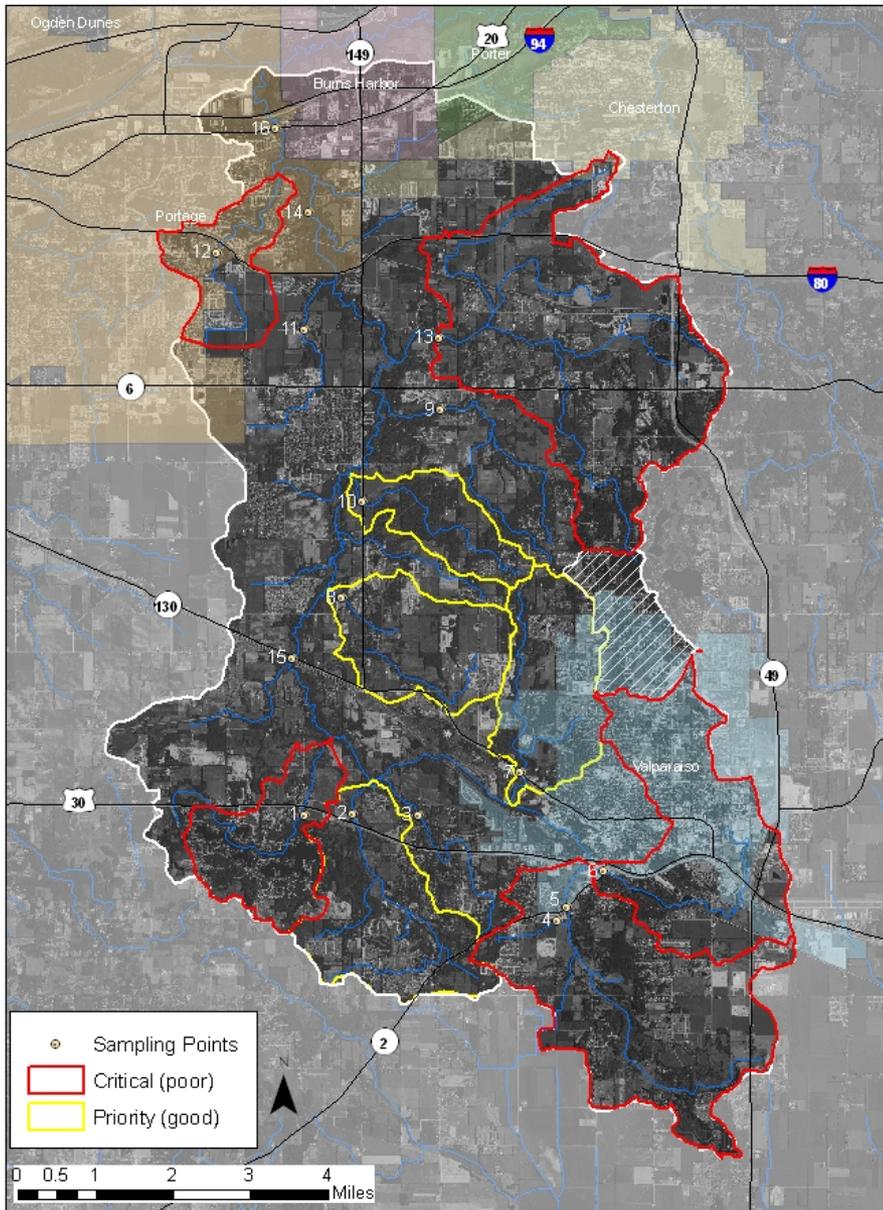


hydrologically-disconnected
(e.g., upland location)
over-application of inputs
minimal residue cover
fine-to-medium textured soils
greater organic matter

hydrologically-connected
medium-to-coarse textured soils
low organic matter
over-application + broadcasting
minimal residue cover
delayed incorporation of manure

hydrologically-connected
greater residue cover (e.g., ridge or no tillage)
minimal application
quickly-expedited incorporation of manure
medium-to-coarse textured soils
low organic matter

The Salt Creek Watershed



Critical and Priority Areas

Critical Areas (Red)

- Need treatment to improve existing poor water quality

Priority Areas (Yellow)

- Need protection to protect relatively good water quality

Based upon:

- historic water quality data,
- current water quality data,
- confirmed sources,
- projected future development,
- and causes of impairment.

NPS Watershed Management

Strategies



Restore

A blue rectangular box with the word "Restore" in white text is centered. It is flanked by two black arrows pointing outwards to the left and right.



Protect

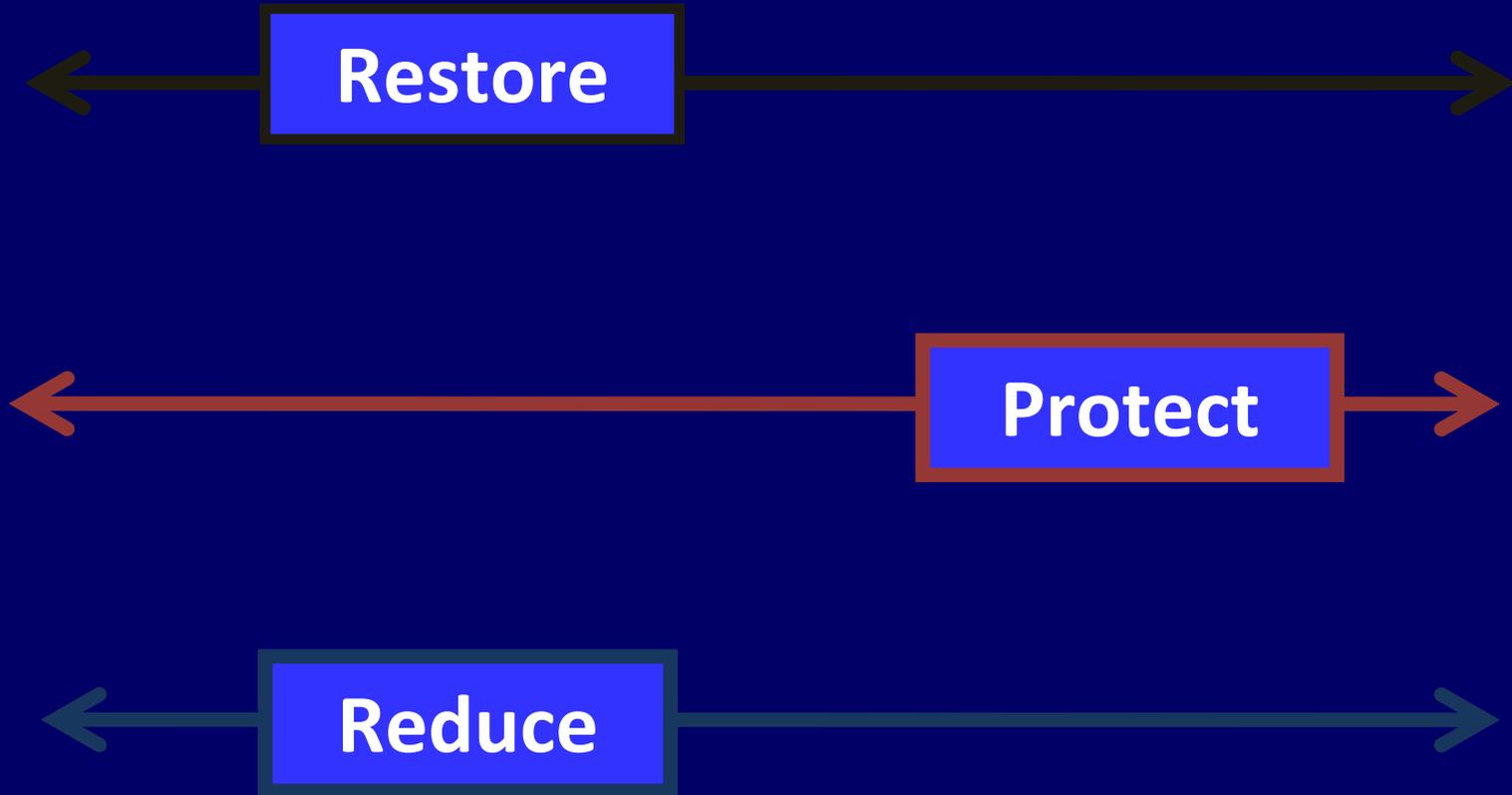
A blue rectangular box with the word "Protect" in white text is centered. It is flanked by two orange arrows pointing outwards to the left and right. The box has a thick orange border.



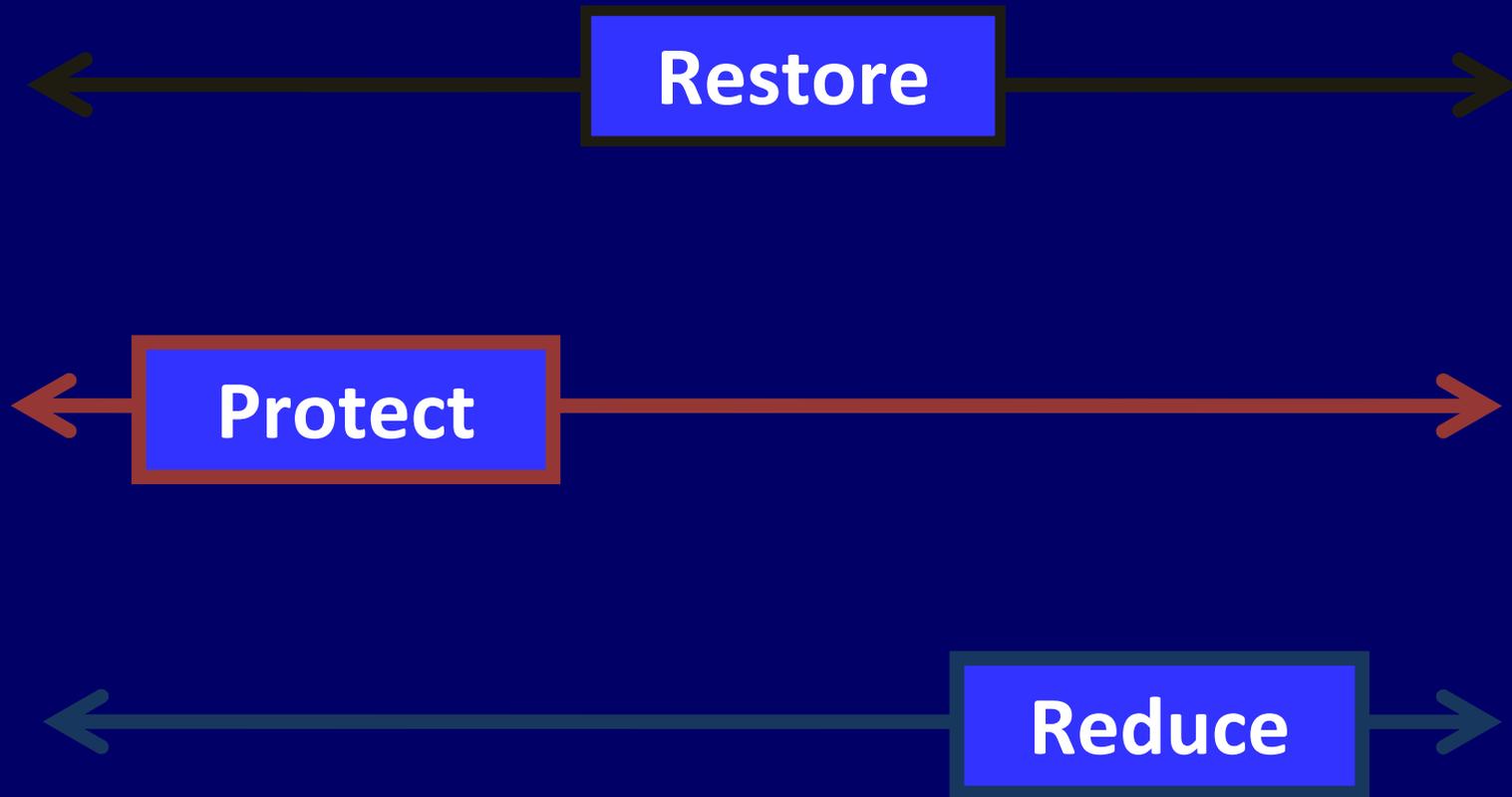
Reduce

A blue rectangular box with the word "Reduce" in white text is centered. It is flanked by two teal arrows pointing outwards to the left and right. The box has a thick teal border.

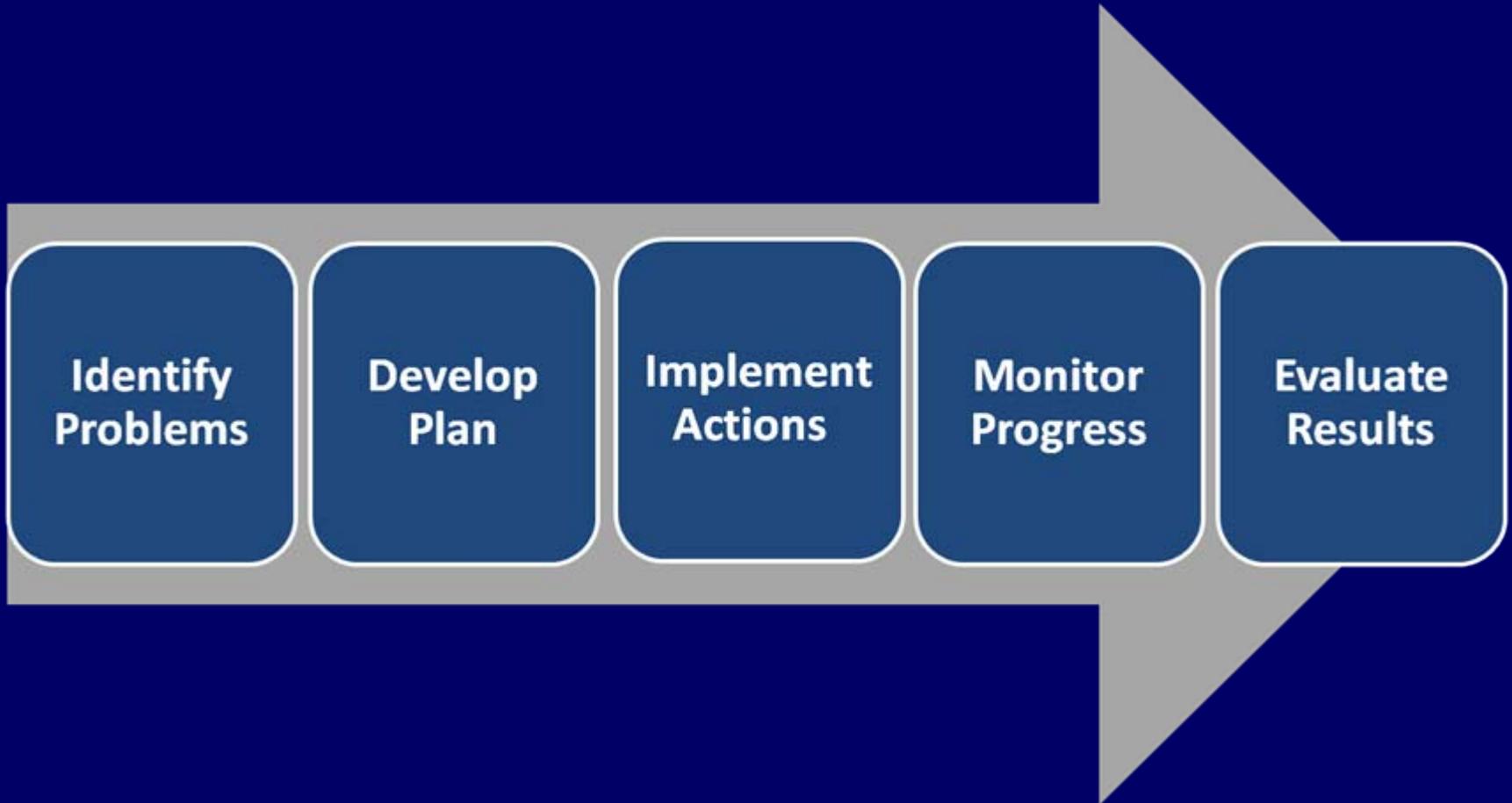
High Quality Stream Strategy



Nutrient Impaired Stream Strategies



Watershed Process



Steps in the Watershed Planning and Implementation Process

1. Build Partnerships

- Identify key stakeholders
- Identify issues of concern
- Set preliminary goals
- Develop indicators
- Conduct public outreach

2. Characterize the Watershed

- Gather existing data and create a watershed inventory
- Identify data gaps and collect additional data if needed
- Analyze data
- Identify causes and sources of pollution that need to be controlled
- Estimate pollutant loads

3. Finalize Goals and Identify Solutions

- Set overall goals and management objectives
- Develop indicators/targets
- Determine load reductions needed
- Identify critical areas
- Develop management measures to achieve goals

4. Design an Implementation Program

- Develop implementation schedule
- Develop interim milestones to track implementation of management measures
- Develop criteria to measure progress toward meeting watershed goals
- Develop monitoring component
- Develop information/education component
- Develop evaluation process
- Identify technical and financial assistance needed to implement plan
- Assign responsibility for reviewing and revising the plan

5. Implement Watershed Plan

- Implement management strategies
- Conduct monitoring
- Conduct information/education activities

6. Measure Progress and Make Adjustments

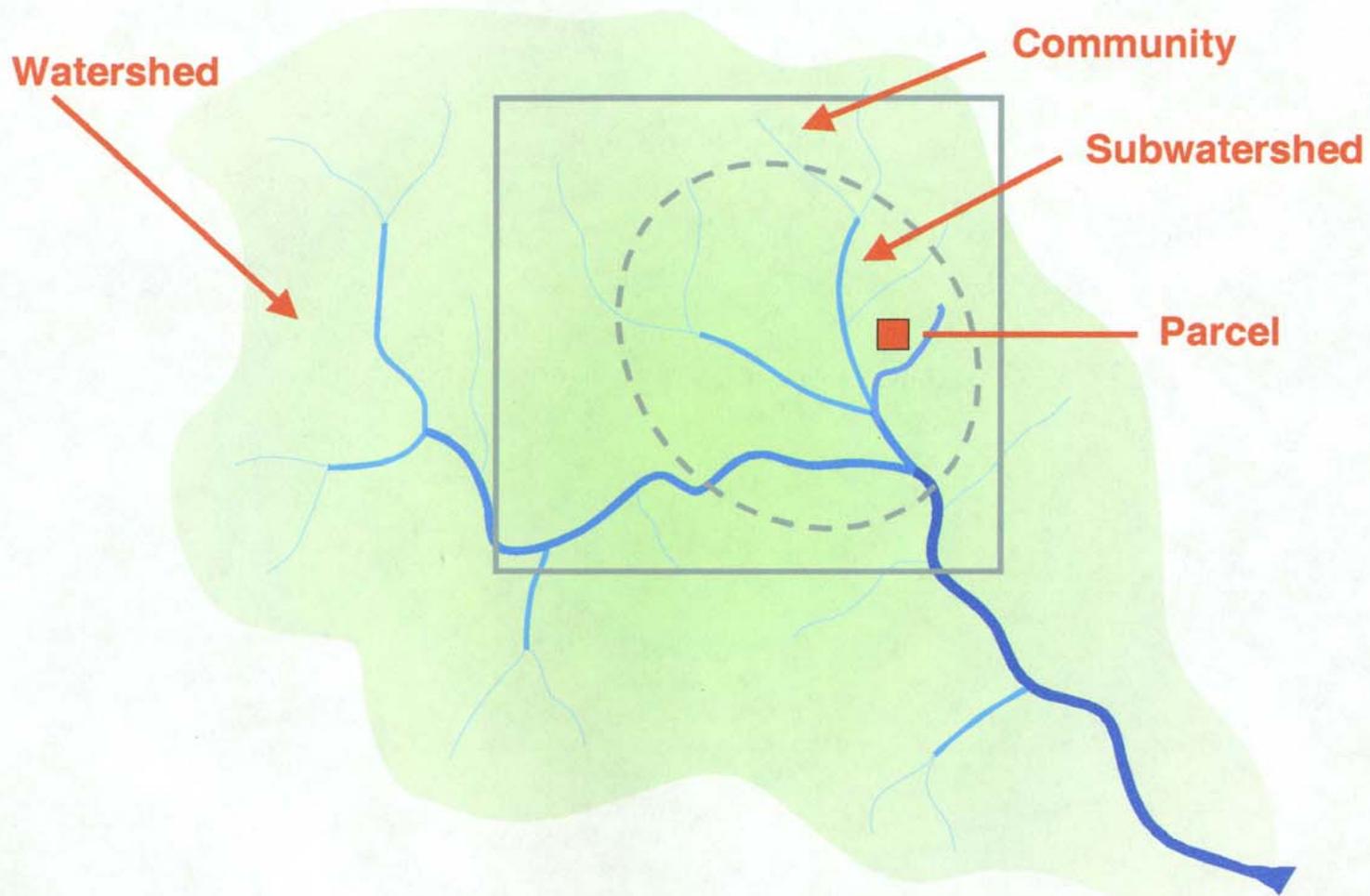
- Review and evaluate information
- Share results
- Prepare annual work plans
- Report back to stakeholders and others
- Make adjustments to program

Characterization and Analysis Tools

- GIS
- Statistical packages
- Monitoring
- Load calculations
- Model selection tools
- Models
- Databases

Watershed Plan Document

A Hierarchy of Implementation



**Implement
Actions**

It sounds SO simple!

**Public participation in
conservation is becoming
“institutionalized”.**

*“Neither do environmentalists speak for soil
and water resources. Degradation of resources
is not as much a problem, but rather an
opportunity to raise more funds and build up
membership.”*

Pete Nowak

The subversive conservationist

Journal of Soil & Water Conservation July/August 2008

Prioritizing management efforts

- Integrate assessment results across objectives
- Example factors to consider:
 - ◆ Highest threats to achieving objectives
 - ◆ Regulatory requirements
 - ◆ Where are existing management regulations, programs, policies, practices falling short
 - ◆ Stakeholder preferences

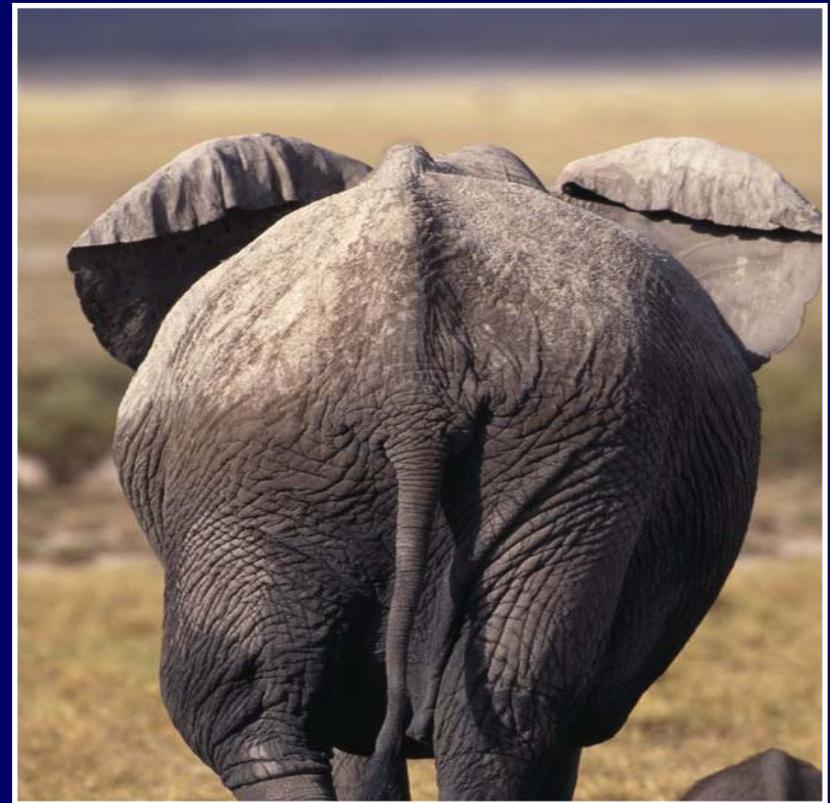




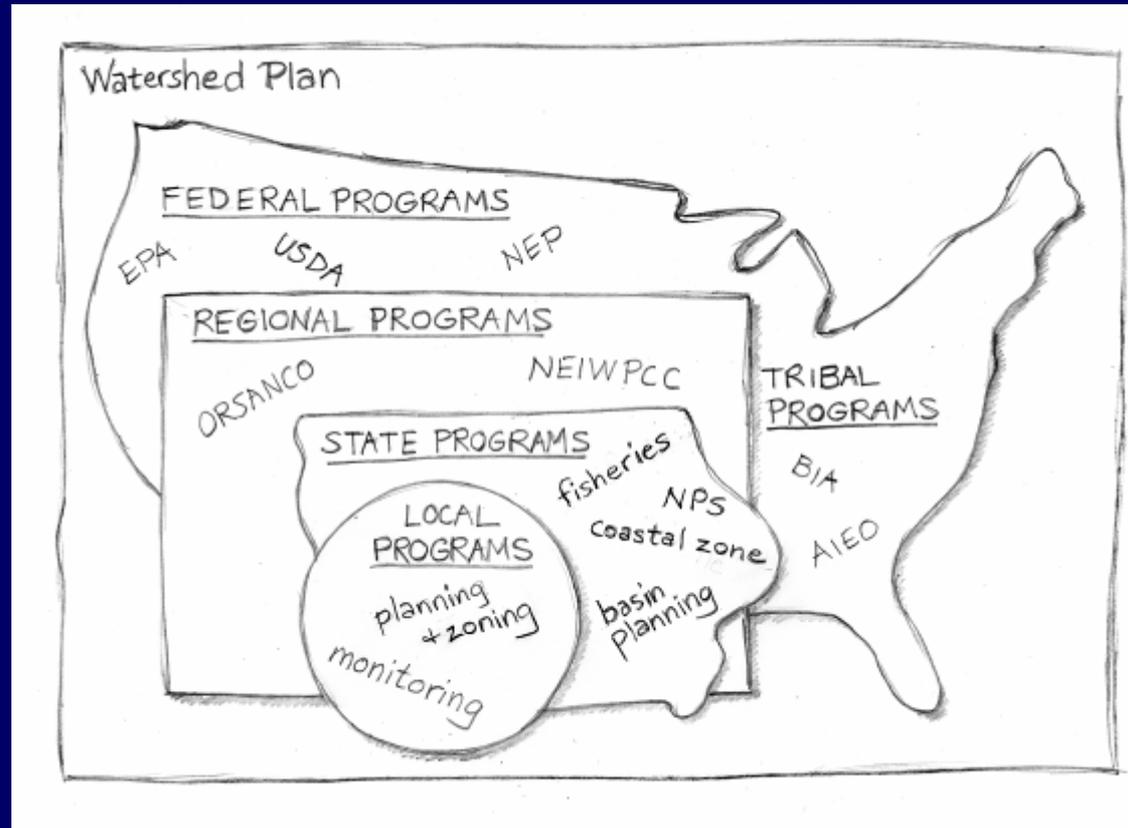
Debunking the myth about targeting

**USDA funds are targeted
just not for water quality
or other environmental
benefits**

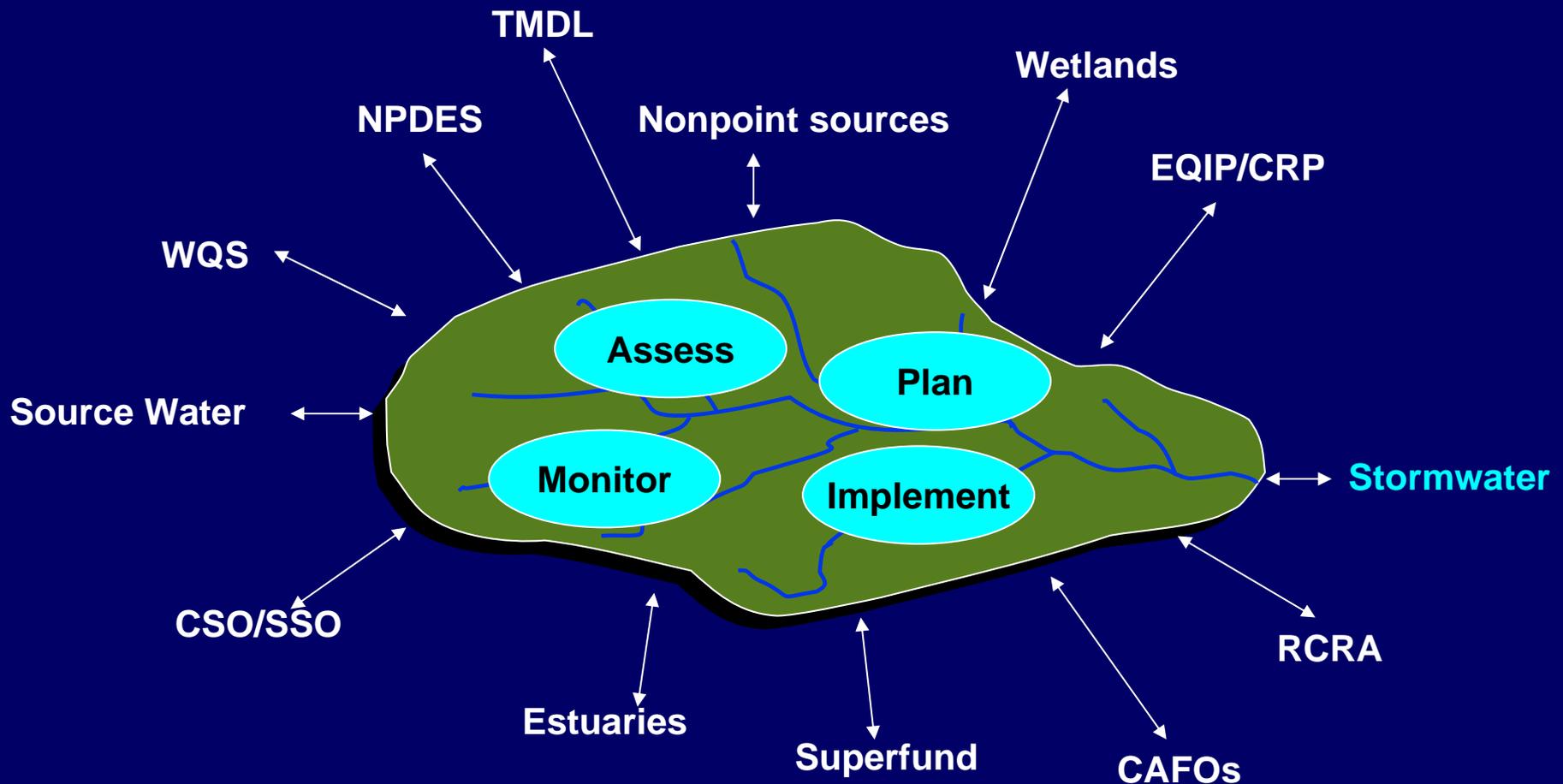
***Targeted programming is
critical to improving BMP
effectiveness.***

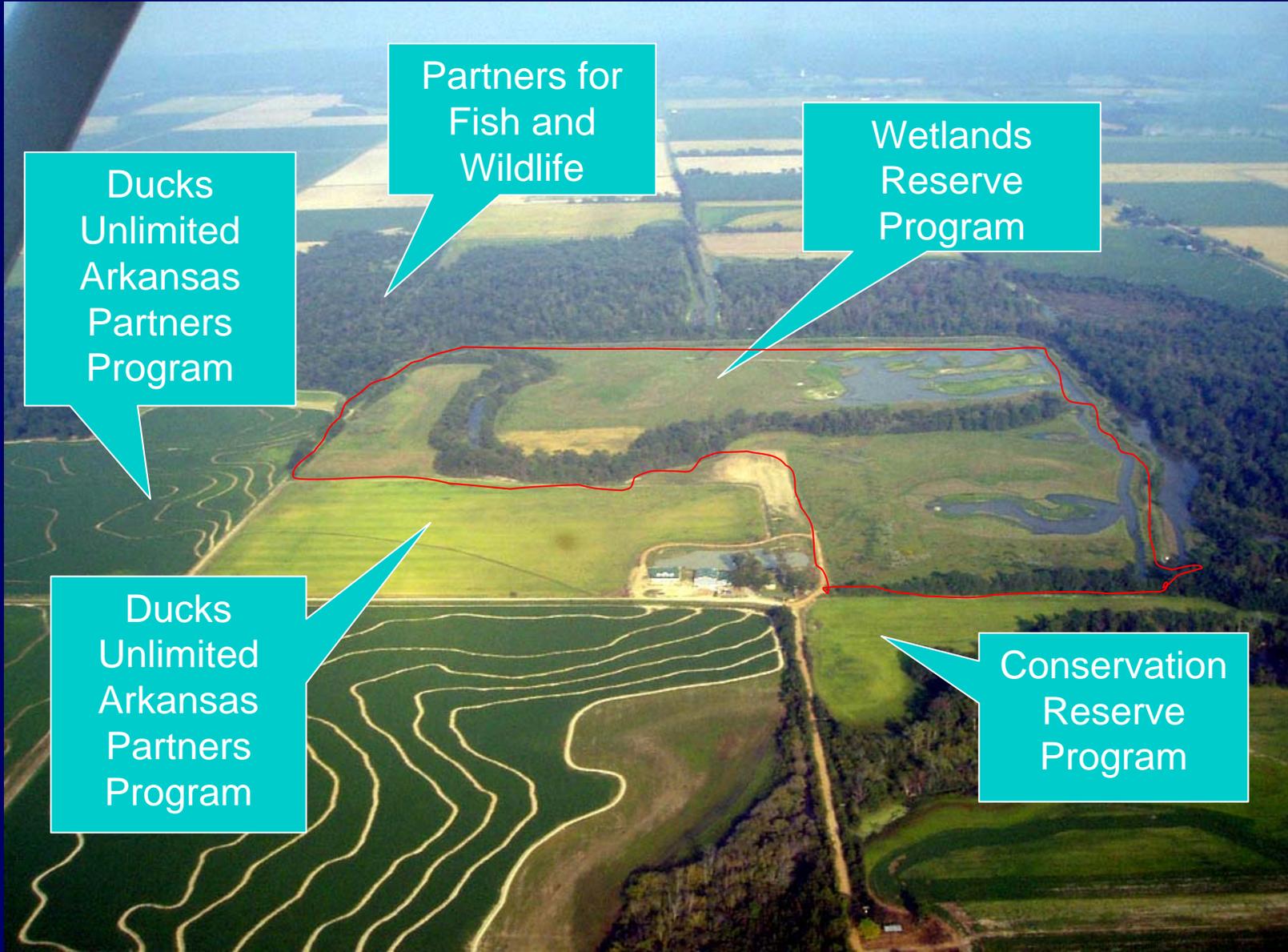


How do I know what other programs I should coordinate my watershed planning efforts with?



Integrated Watershed Planning





Ducks Unlimited Arkansas Partners Program

Partners for Fish and Wildlife

Wetlands Reserve Program

Ducks Unlimited Arkansas Partners Program

Conservation Reserve Program

Ac - counting we will go!

One a BMP!
Two a BMP!
Tree a BMP!

Dollars Spent
Practices Contracted
Loads (theoretically) Reduced
Millions and billions, oh my



Have we lost track of what is
important???

Indicators & targets: short/long term

Worksheet 12-2

Developing Criteria to Measure Progress in Meeting Water Quality Goals

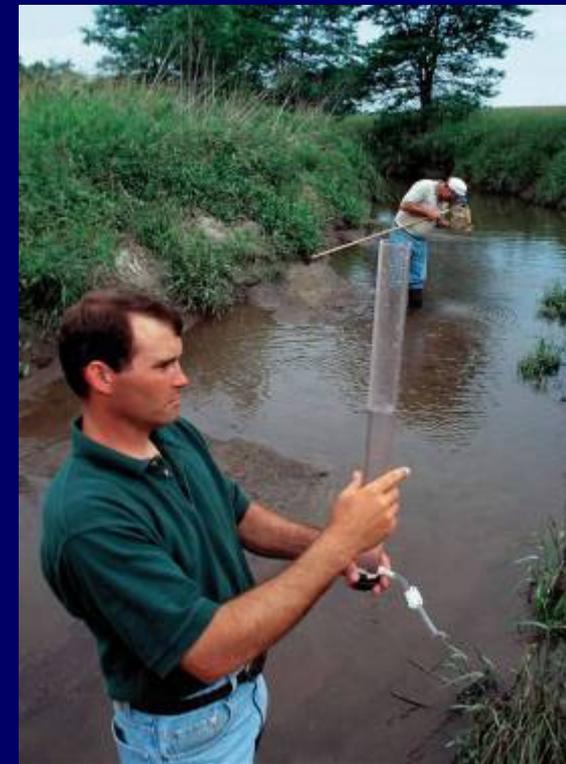
[Note: Complete one worksheet for each management objective identified.]

Management Objective: Reduce nutrient inputs into Cane Creek by 20 percent

Indicators to Measure Progress	Target Value or Goal	Interim Targets		
		Short-term	Medium-term	Long-term
P load	44 t/yr	52 t/yr	49 t/yr	44 t/yr
# of nuisance algae blooms	0	2	1	0
transparency	5.5 m	4.1 m	4.9 m	5.5 m
frequency of taste and odor problems in water supply	0	1	1	0
hypolimnetic DO	5.0 mg/L	2.5 mg/L	4.0 mg/L	5.0 mg/L

Measuring improvements: linking 106/319

- Document the parameter(s) you're trying to impact (sediment, nutrients, etc.)
- Identify measurable criteria associated with the parameter(s)
- Develop the most cost-effective monitoring program possible
- Be selective! Don't monitor everything! Monitor to answer questions



What can watershed plans provide?

- ◆ **Clear Purpose & a Roadmap** - needed to coordinate complex scientific, social, and economic activities
- ◆ **Accountability** – What indicators are we going to count and why are they important to watershed resources?
- ◆ **Program Integration thru Partnerships** - TMDLs, 319, NPDES, Source Water Protection, wetlands, Farm Bill Programs, local planning, private investment

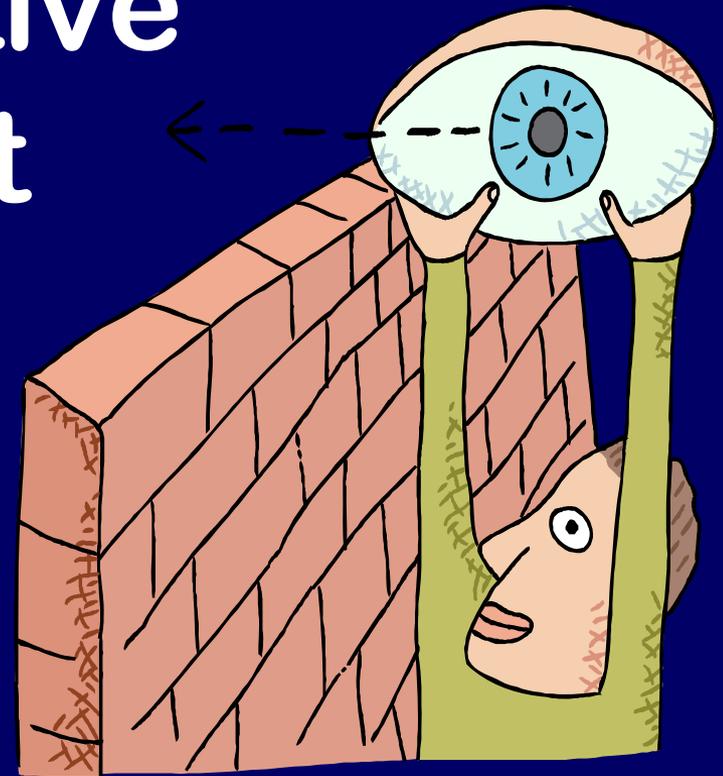
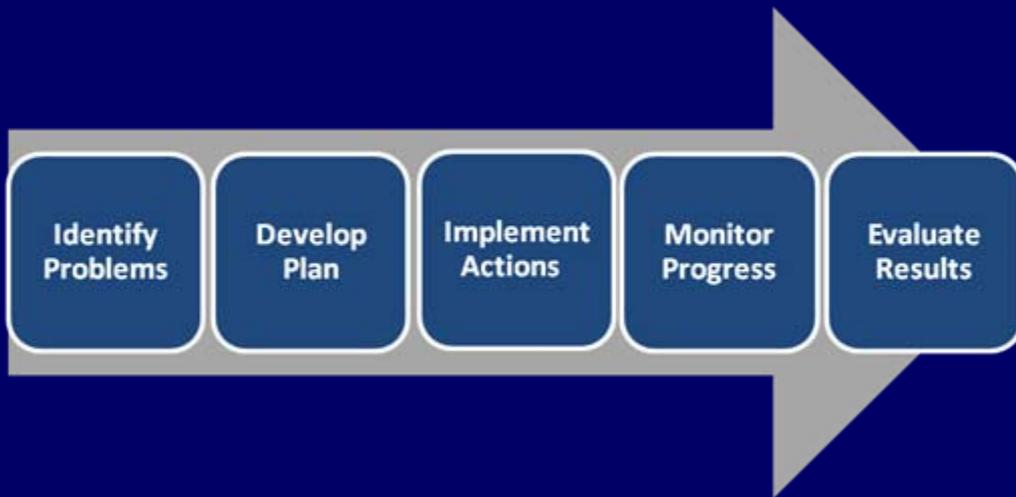
Extracting Program Workplans from the Watershed Plan

Table 13-1. Comparison of Example Parameters in a Hypothetical Watershed Plan and 319 Work Plan

Parameter	Lake Fraser Watershed Management Plan	319 Work Plan #1
Period	2003–2013	2003–2006
Geographic scope	180,000 acres	24,000 acres
Critical areas	52,000 acres	7,000 acres
Goal statement	Improve watershed conditions to support sustainable fisheries	Reduce sediment loadings from priority subwatershed X
Example objectives and key elements	<ul style="list-style-type: none"> • Increase the Index of Biotic Integrity (IBI) from 30 to 75 • Identify causes and sources of sediment • Identify load reduction expected • Identify management practices needed • Identify critical areas 	<ul style="list-style-type: none"> • Treat 5,000 acres of cropland with crop residue management (CRM) practices • Install six terraces to treat 1,200 acres • Establish five buffer strips for a total of 8,000 feet
Implementation	<ul style="list-style-type: none"> • CRM: 2,000 acres of row crop/year into CRM • Terraces: 4 fields/year, 40 fields total • Buffers: restore 1 to 1.5 miles of riparian area/year, 8 miles total • Field buffers: 100 fields total 	<ul style="list-style-type: none"> • Develop training materials on CRM in year 1 • Hold two workshops each in years 2 and 3 • 2 terraces/year • One buffer strip in first year and two each in years 2 and 3
Costs	\$4.02 million over 10 years <ul style="list-style-type: none"> • \$800,000 for information and education (I/E) • \$800,000 for monitoring and reporting • \$1,980,000 for buffers (18,000 acres at \$110/acre) • \$140,000 for 40 terraces • \$500,000 for CRM 	\$250,000 over 3 years <ul style="list-style-type: none"> • \$50,000 to prepare training materials and give 5 workshops on CRM • \$160,000 for management practice cost sharing • \$40,000 for monitoring and reporting
Schedule	<ul style="list-style-type: none"> • Begin slowly and accelerate (build on successes) • Establish interim milestones <ul style="list-style-type: none"> - Cropland: 2008 – reduce soil erosion by 80,000 tons/year - Streambanks: 2006 – stabilize 10,000 feet of eroding streambanks - 2010 – stabilize 30,000 feet of eroding streambanks • Push I/E early and complete by year 6 • Annual reports that track progress • Coordinate with partners 	<ul style="list-style-type: none"> • See above • Annual progress reports
Monitoring	<ul style="list-style-type: none"> • Environmental – water quality, IBI, acres treated, tons of soil erosion reduced, feet of streambank stabilized • Administrative – contracts approved, funds expended, and funds obligated • Social - landowners contacted • Changes in public understanding resulting from I/E 	<ul style="list-style-type: none"> • Attendance at CRM training workshops • Acres of cropland using CRM • Feet of stream buffers established • Feet of field buffers established • Number of terraces • Environmental: reduction in sediment loads • Administrative: contracts approved and funds expended • Social: landowners contacted

And finally

Practice Adaptive Management



Finally...Make Adjustments

- Monitor water quality and BMPs
- Compare results to goals
- Are you making progress?
- Are you meeting your goals?
- If you aren't meeting implementation milestones
- If you aren't making progress toward reducing pollutant loads....



Then...do it all over again!

Things to consider

- Size
- Degree of uncertainty
- Plan to solve problems – not for funds
- Plan to make better decisions



Lost in the Jargon Fog

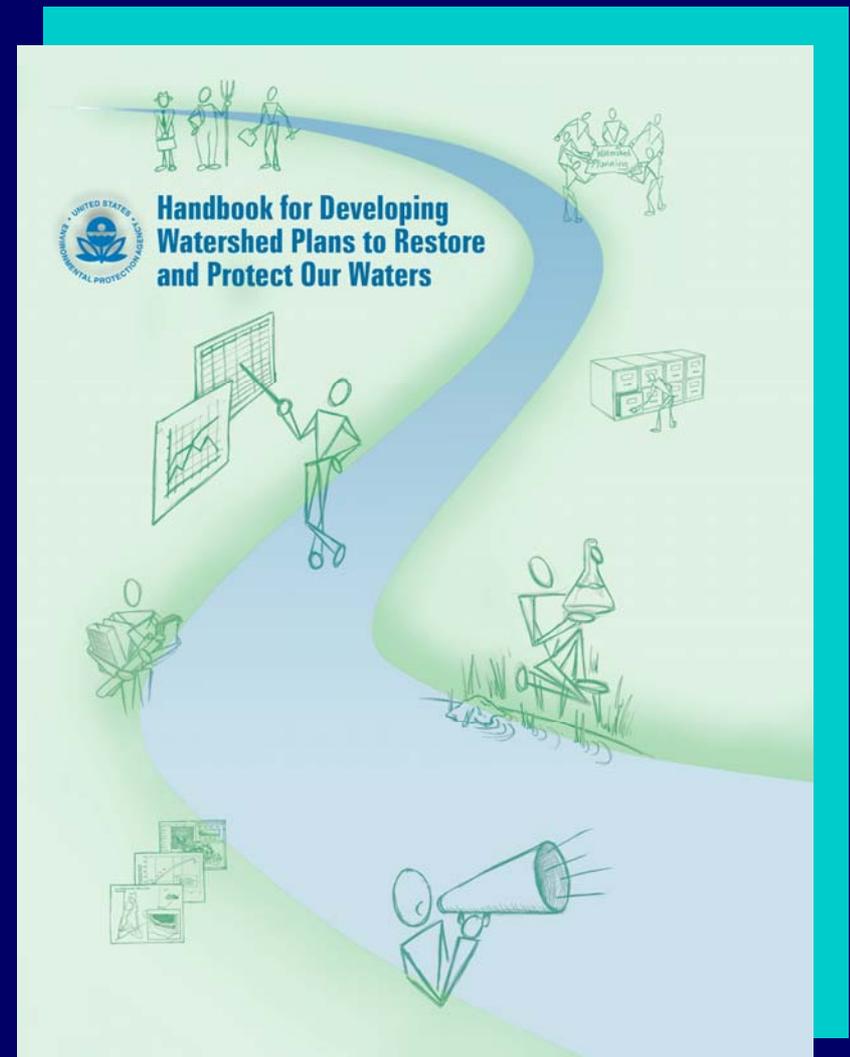
Roof Water Management Practices

A silhouette of a person sitting in a long, narrow boat on a body of water. The scene is very foggy, with a grey, overcast sky and a misty horizon. The person is holding a long pole. A thought bubble originates from the person's head, containing text.

Sounds like a gutter grant if you ask me.

Questions?

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www.epa.gov/nps/watershed_handbook/