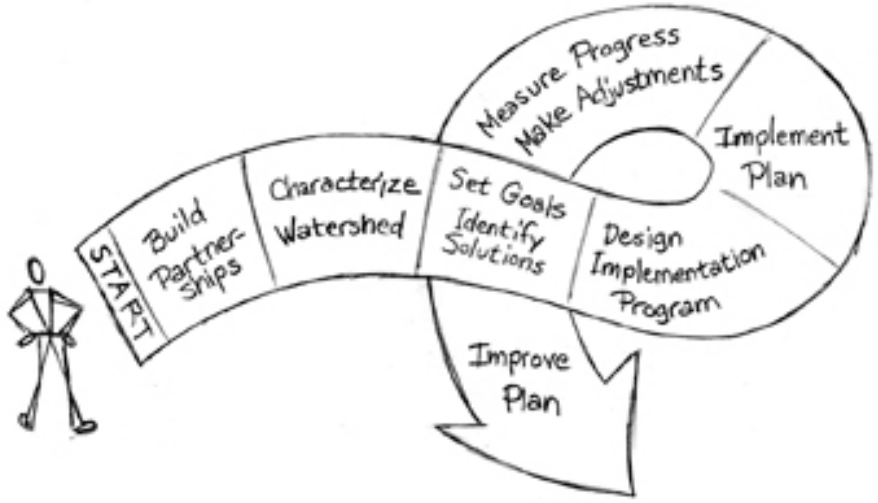
Water Resource Plans



West Virginia Water Resources Training Workshops

Presented by the Interstate Commission on the Potomac River Basin

Sponsored by the West Virginia Department of Environmental Protection

With funding from the American Reinvestment & Recovery Act

Image source: EPA, “Watershed Planning Process”
http://iaspub.epa.gov/watershedplan/planningProcess.do?pageId=33&navId=33

Outline

- Benefits of having a plan
- Nuts and bolts of developing a plan
  - Elk Headwaters example, Downstream Strategies
- Resources to get you started

Description

Watershed Approach:

A flexible framework for managing water resource **quality** and **quantity** within specified drainage area, or **watershed**. This approach includes **stakeholder** involvement and management actions supported by **sound science** and appropriate technology.

Watershed Plan:

A document that provides **assessment** and **management information** for a geographically defined watershed, including the analyses, actions, participants, and resources related to development and implementation of the plan.

Source: EPA, *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*. (2008)

Benefits

- Integrates activities going on in watershed
- Identifies priority areas for projects and activities
- Prevention and planning can be cheaper than restoration and clean up
- Framework to prioritize funding and staff time
- Plans in hand when funding becomes available

Developing a watershed management plan

Existing resources, guides, and manuals

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

Maryland DNR's *A User's Guide to Watershed Planning in Maryland*

Watershed Plan Steps

1. **Build partnerships**
2. **Characterize the watershed**
3. **Develop watershed planning goals**
4. **Design an implementation program**
5. **Implement watershed plan**
6. **Measure progress and make adjustments**

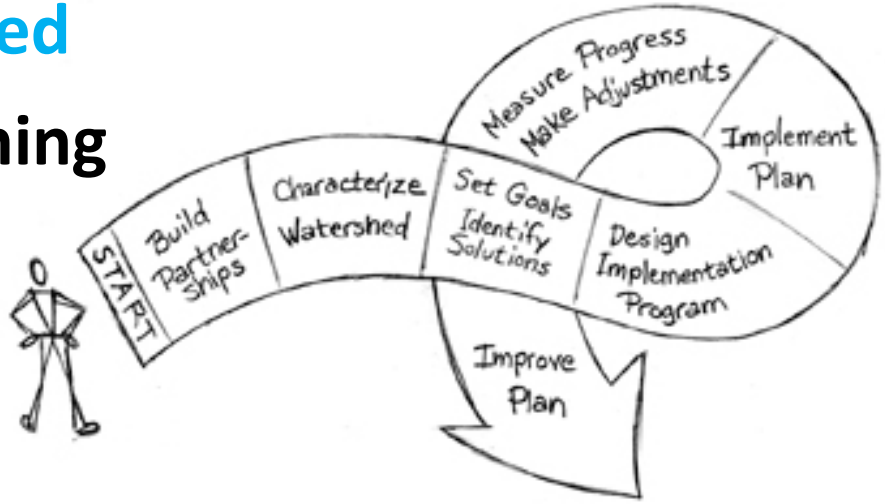
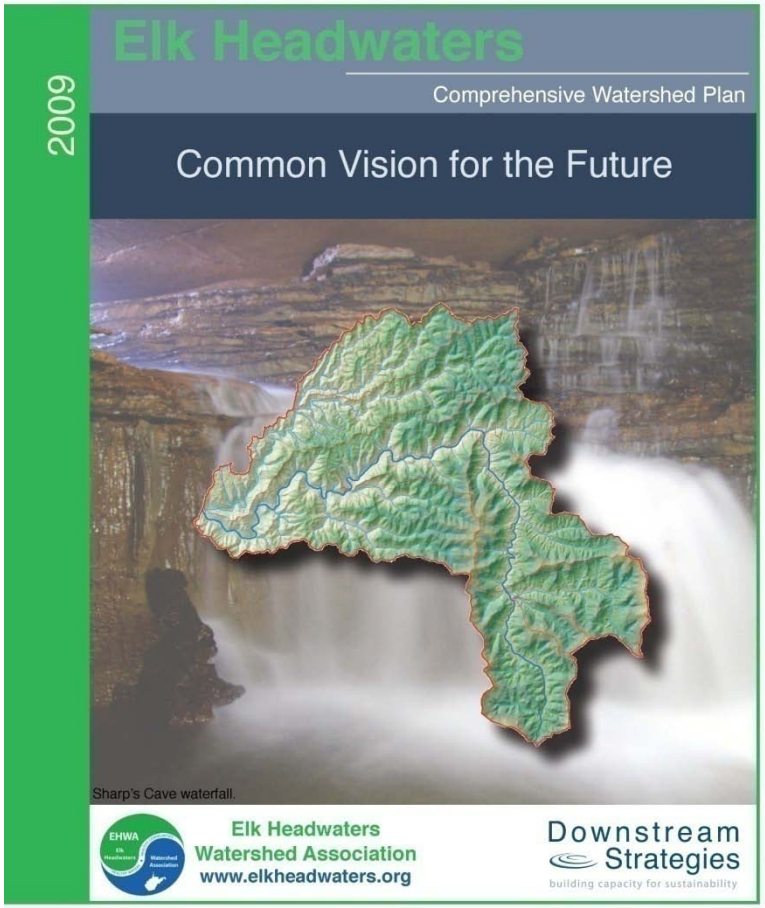


Image source: EPA, "Watershed Planning Process"
http://iaspub.epa.gov/watershedplan/planningProcess.do?pageId=33&navId=33

Elk Headwaters
Comprehensive Watershed Plan



Downstream Strategies

EHWA
Elk Headwaters
Watershed Association
HEALTHY COMMUNITIES
HEALTHY WATERS

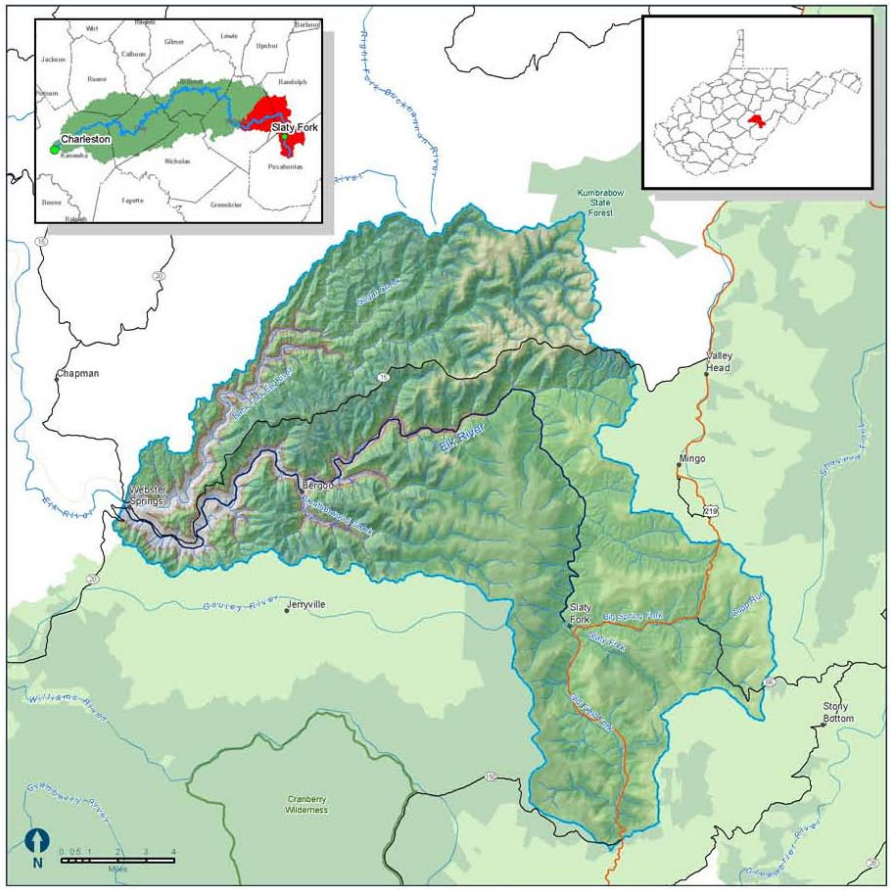
Image source: Elk Headwaters Watershed Association and Downstream Strategies, *Common Vision for the Future*: http://www.elkheadwaters.org/Documents/

Elk River Headwaters Watershed

Counties:
- Pocahontas
- Webster
- Randolph

Resources:
- Trout fishing
- High fish biodiversity
- Timber
- Tourism

Figure 2: The Elk Headwaters study area



Concerns:
- Water quality
- Economic development
- Centralized WWTP
- Sedimentation
- Flooding

Downstream Strategies

Image source: Downstream Strategies, *State of the Watershed: Elk Headwaters, West Virginia*: http://www.elkheadwaters.org/Documents/

Step 1: Build Partnerships

- Identify stakeholders
- Develop strategy for involvement
  - Technical work groups, voting, public participation
- Determine lead organization and/or person

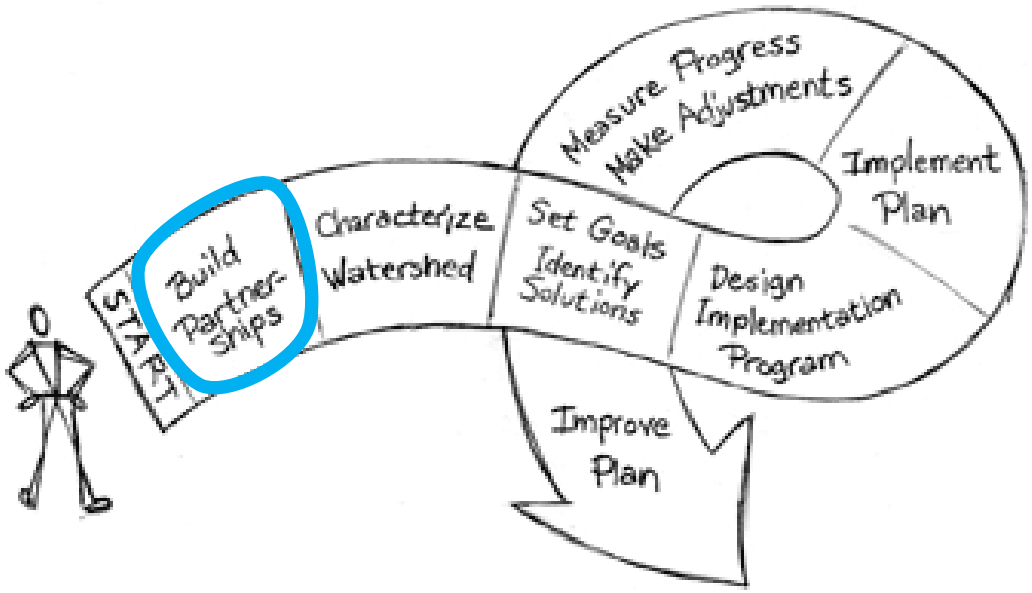


Image source: EPA, “Watershed Planning Process” http://iaspub.epa.gov/watershedplan/planningProcess.do?pageId=33&navId=33

Elk Headwaters: Stakeholder Process

- Elk Headwaters Watershed Association
- Residents and businesses in Elk Headwaters
- Public health and environmental organizations

- 5 open meetings
- Radio and newspaper announcements
- Website
- Documents

Image source: Elk Headwaters Watershed Association and Downstream Strategies, *Common Vision for the Future*: http://www.elkheadwaters.org/Documents/

Downstream Strategies

Step 2: Characterize the Watershed

- Delineate watershed and/or planning boundaries
- Collect available data
- Organize data
  - Databases
  - GIS mapping
- Identify experts
- Identify gaps in data and knowledge
- Fill gaps

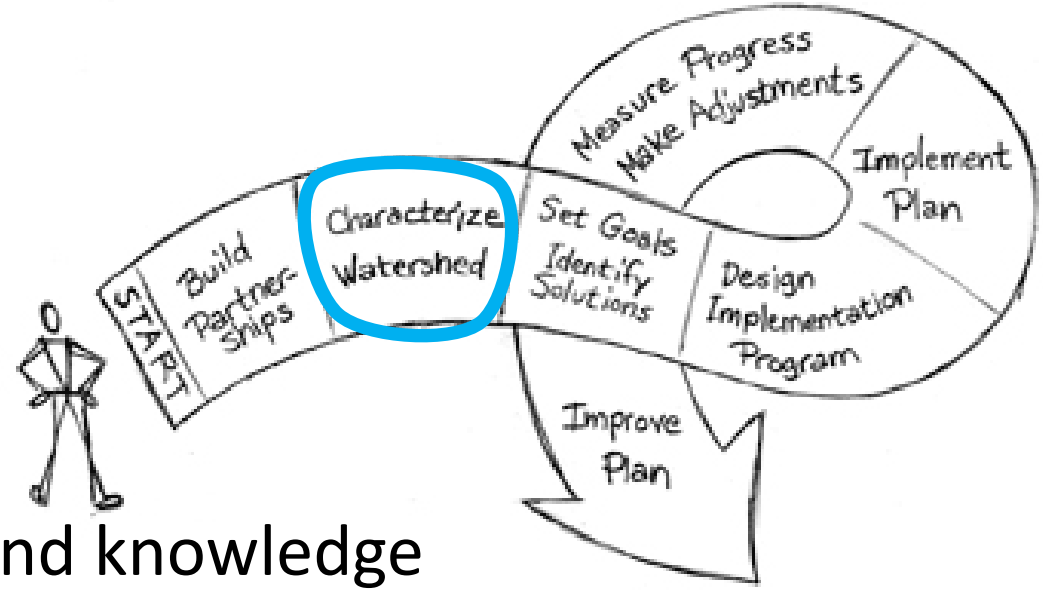


Image source: EPA, “Watershed Planning Process” http://iaspub.epa.gov/watershedplan/planningProcess.do?pageId=33&navId=33

Data, Data, and more Data

How much water, where, when

- Factors for managing flows, 7Q10

Water use

- How much
- Where from
- What purpose: water supply, industry, recreation

Projected use

- When, from where, how much

How much storage do you have?

- Timing, quantity

Demographics

Wastewater

- How much
- Where does it go
- What's in it

Areas of special importance

- Wetlands
- Floodplains
- Public lands
- Source water area

Land use/land cover

- Current
- Future
- Runoff potential

Climate

- Temperature
- Precipitation
- Evaporation

Soil type

Water quality

Potential sources of pollution

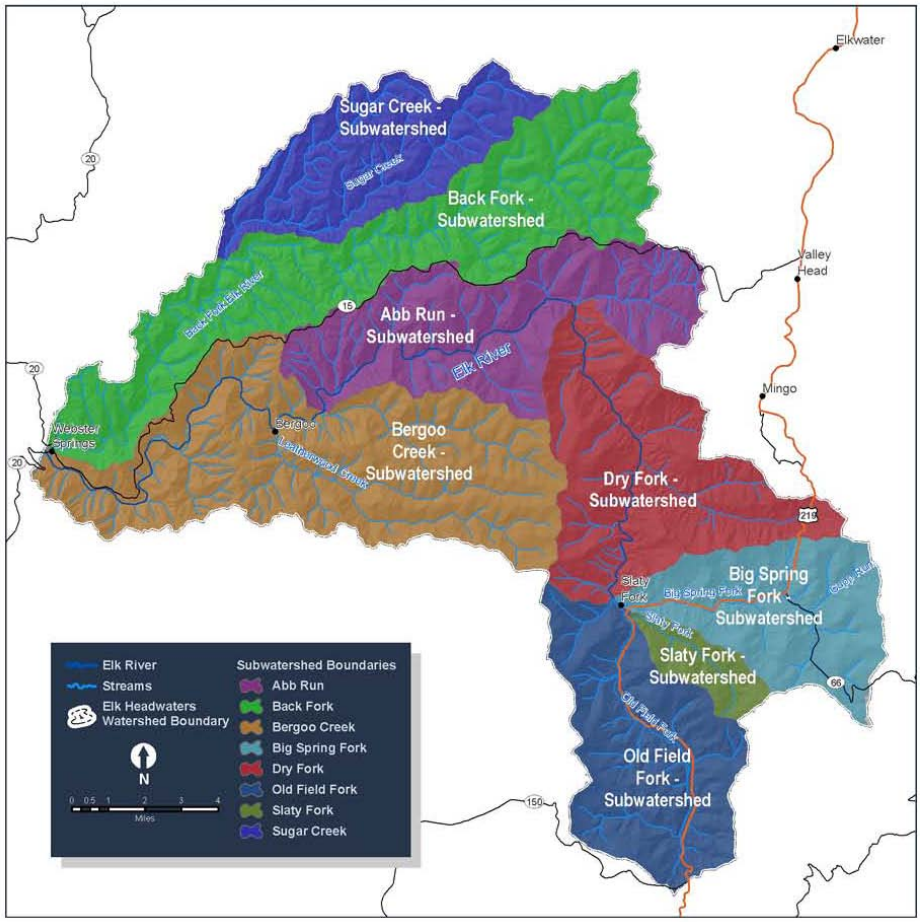
- NPDES permits
- Stormwater, CSOs
- Point source
- Non-point source
- TMDLs

Regulatory context

- Designated uses
- Water quality standards
- Drinking water standards
- Wastewater treatment standards

Elk Headwaters: Watershed Delineation

Figure 3: Subwatersheds in the Elk Headwaters watershed

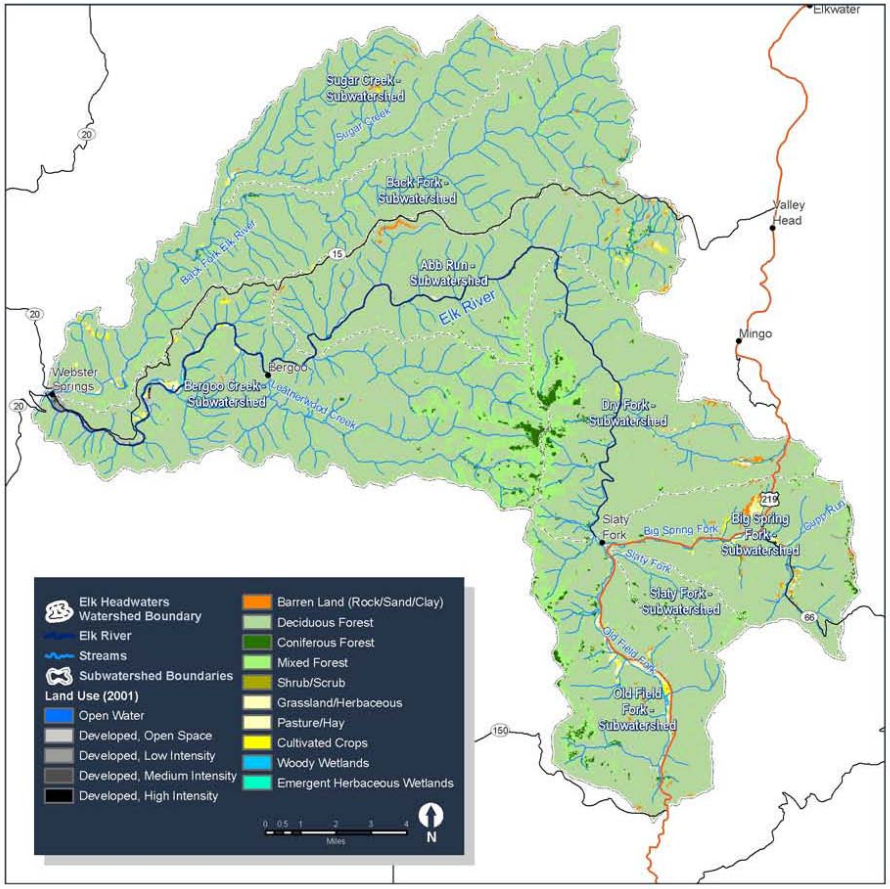


Downstream Strategies

Image source: Downstream Strategies, *State of the Watershed: Elk Headwaters, West Virginia*: http://www.elkheadwaters.org/Documents/

Elk Headwaters: Land Use

Figure 4: Land use (2001)

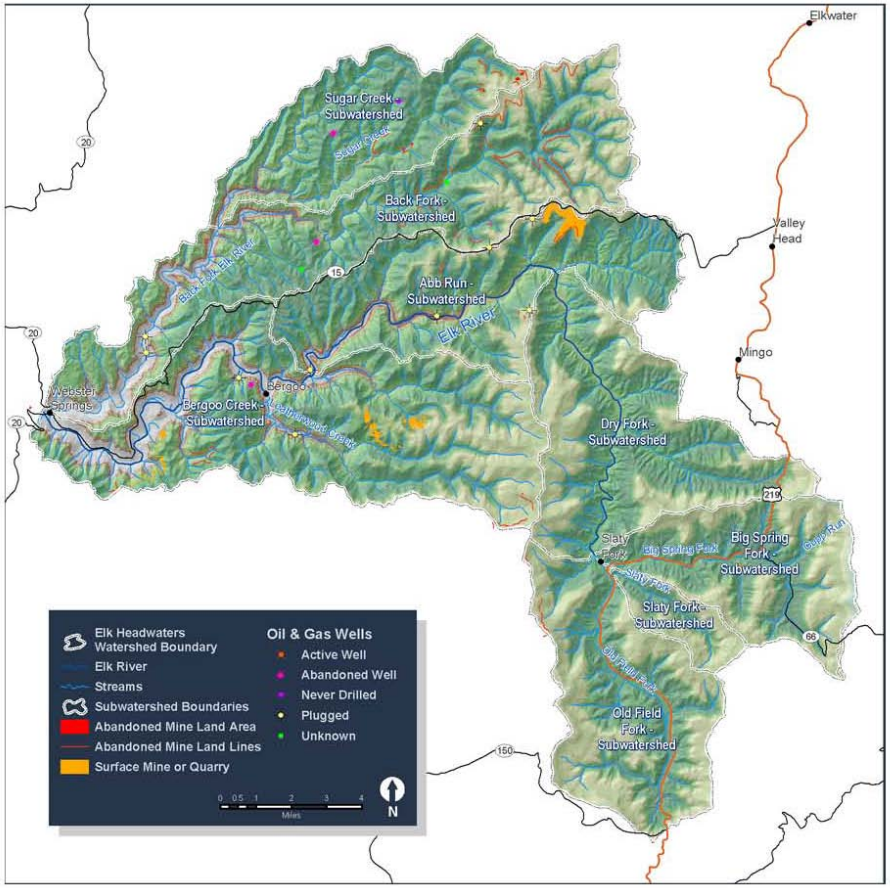


Downstream Strategies

Image source: Downstream Strategies, *State of the Watershed: Elk Headwaters, West Virginia*: http://www.elkheadwaters.org/Documents/

Elk Headwaters:
Mining and Oil and Gas Operations

Figure 5: Mining and oil and gas operations



Downstream Strategies

Image source: Downstream Strategies, *State of the Watershed: Elk Headwaters, West Virginia*: http://www.elkheadwaters.org/Documents/

Step 3: Develop watershed planning goals

- Consensus on goals, objectives, and desired outcomes
- How is water used? What are the goals of the community?
  - Drinking water
  - Recreation and tourism
  - Industry
  - Environment
- Prepare for floods, droughts
- Current and future needs
- Water quality concerns for desired uses
- Regulatory considerations (drinking water criteria, 303d impairments)

Image source: EPA, "Watershed Planning Process" http://iaspub.epa.gov/watershedplan/planningProcess.do?pageId=33&navId=33

Elk Headwaters: Common Vision for the Future

1. To preserve and improve residents' **quality of life** and to sustain and build the **economy** of the Elk Headwaters watershed, **future development is aligned with environmental protection**.
2. **Abundant, clean water resources** underpin the health of people and ecosystems across the watershed.
3. The watershed's **visual beauty, natural features, and historical and cultural resources** are preserved because they serve as a **foundation for the economy**, represent a unique piece of West Virginia's heritage, and make it an attractive place to visit, live, and work.
4. The watershed's **tourism businesses**—and the recreational opportunities that they are built upon—are sustained in the long term.
5. **Non-tourism businesses** grow and use practices to protect and enhance watershed health.

(partial list)

Downstream Strategies

Source: Elk Headwaters Watershed Association, *Common Vision for the Future*: http://www.elkheadwaters.org/Documents/

Step 4: Design an Implementation Program/ Write plan

- Prioritize goals
- Identify current programs and projects that meet plan's goals
- Develop new projects and management measures to meet goals
- Indicators of success
- Timeline
- Financing

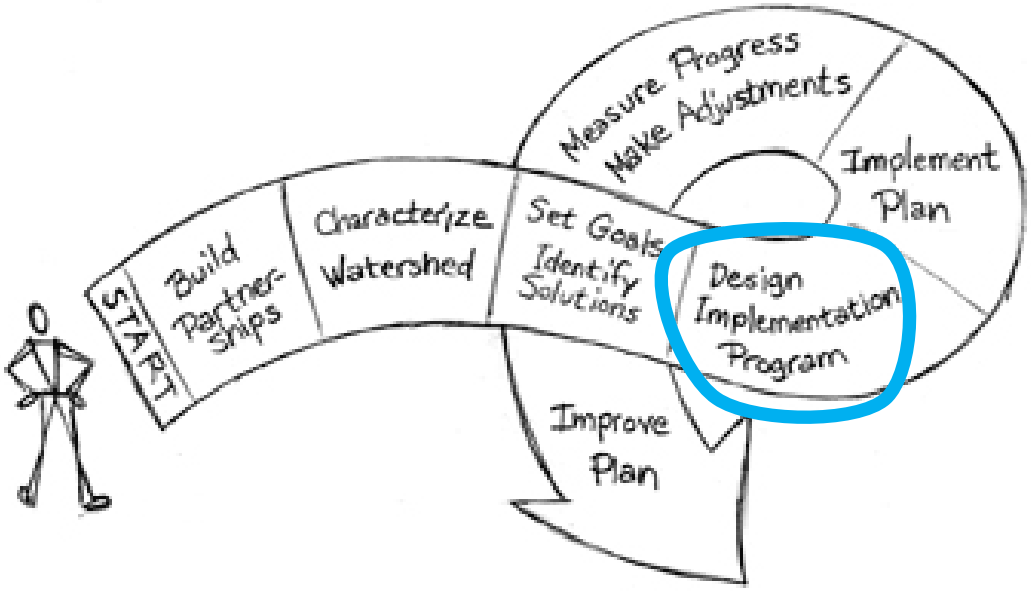


Image source: EPA, "Watershed Planning Process" http://iaspub.epa.gov/watershedplan/planningProcess.do?pageId=33&navId=33

Elk Headwaters: Timeline

Table 1: Detailed project schedule

Phases and Tasks	1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10
Project awarded								
1. Refine the water quality monitoring plan,			EHWA Review					
2. Conduct a land-use vulnerability analysis,				EHWA Review				
3. Identify on-the-ground sediment projects,			Visit	Design	Plan			
4. Assessment of decentralized wastewater options								
5. Develop watershed management system							Demo/Install	
Draft Products							Draft	
Final Products							Review	Final
Key	Task		Milestone					

Downstream Strategies

Image source: Downstream Strategies, *Elk Headwaters Watershed Planning and Analysis, West Virginia*: http://www.elkheadwaters.org/Documents/

Elk Headwaters: Budget

Table 2: Detailed budget

Description	Costs					Project total
	Labor	Subcont.	Printing	Travel	Overhead	
Refine the water quality monitoring plan						
Plan and protocols	1,600	0	0	0		1,600
QAPP	640	0	0	0		640
Data management plan and system	800	0	0	0		800
Meetings with stakeholders, training	1,000	0	100	106	10	1,216
Subtotal						*$4,256*
Conduct a land-use vulnerability analysis						
Vulnerability analysis	6,000	0	0	0		6,000
Growth model	4,000	0	0	0		4,000
Well inventory	900	0	0	0		900
Development inventory	1,000	0	0	0		1,000
Meetings with stakeholders	1,600	0	100	106	10	1,816
Subtotal						*$13,716*
Identify on-the-ground sediment projects						
Stream walks, identify projects	1,200	2,300	0	620	31	4,151
Conceptual designs and report	4,200	2,300	0	0		6,500
Meetings with stakeholders	1,600	0	100	106	10	1,816
Subtotal						*$12,467*
Conduct a basic decentralized assessment						
Predicted septic failure rates	2,000	0	0	0		2,000
Septic inventory	1,000	0	0	0		1,000
Septic density threshold	2,000	0	0	0		2,000
Meetings with stakeholders	1,600	0	100	106	10	1,816
Subtotal						*$6,816*
Deliver a watershed management system						
Tool to model development scenarios	4,400	828	0	0		5,228
Geodatabase	1,000	0	0	0		1,000
Chemical database	1,300	0	0	0		1,300
Monitoring data input, analysis, reports	3,200	0	0	0		3,200
Metadata, documentation, dissemination	1,400	0	0	0		1,400
Help write GIS grant	4,000	0	0	0		400
Meetings with stakeholders, training	3,000	0	100	106	10	3,216
Subtotal						*$15,744*
Total	45,840	5,428	500	1,650	82	53,000

Downstream Strategies

Image source: Downstream Strategies, *Elk Headwaters Watershed Planning and Analysis, West Virginia*: http://www.elkheadwaters.org/Documents/

Step 5: Implement Watershed Plan

- Watershed agreement, MOU, directive, consensus statement, comprehensive plan
- Projects
- Management changes
- Outreach and education
- Monitoring plan

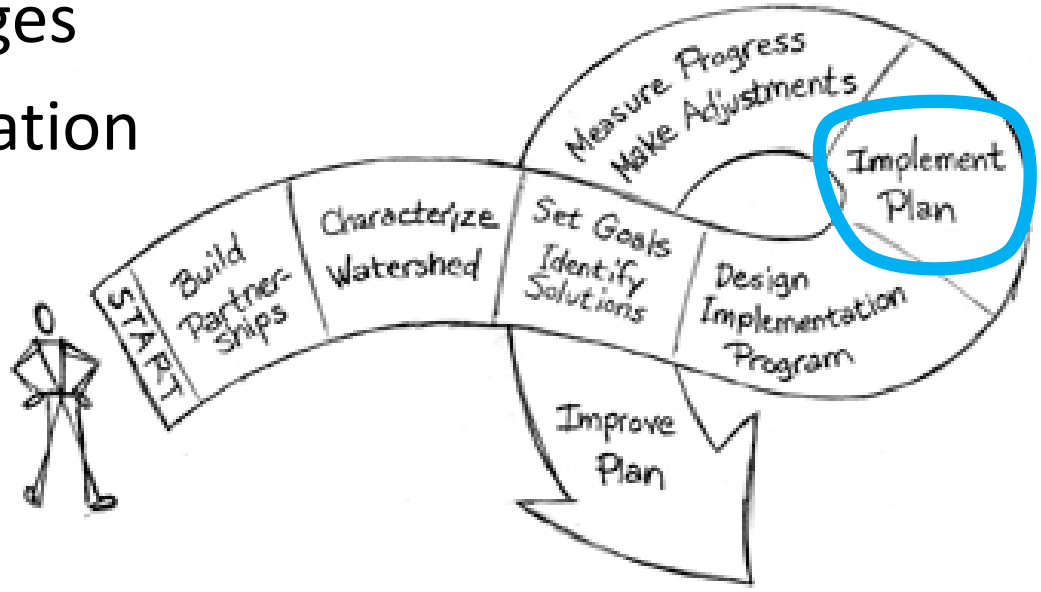
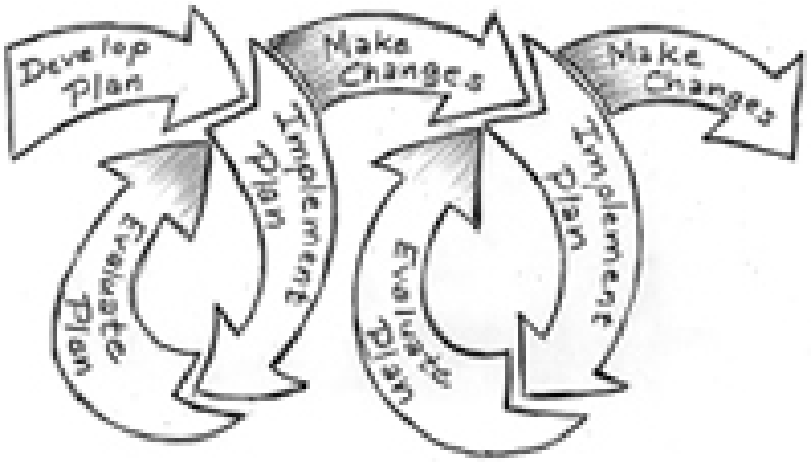


Image source: EPA, “Watershed Planning Process” http://iaspub.epa.gov/watershedplan/planningProcess.do?pageId=33&navId=33

Step 6: Measure Progress and Make Adjustments



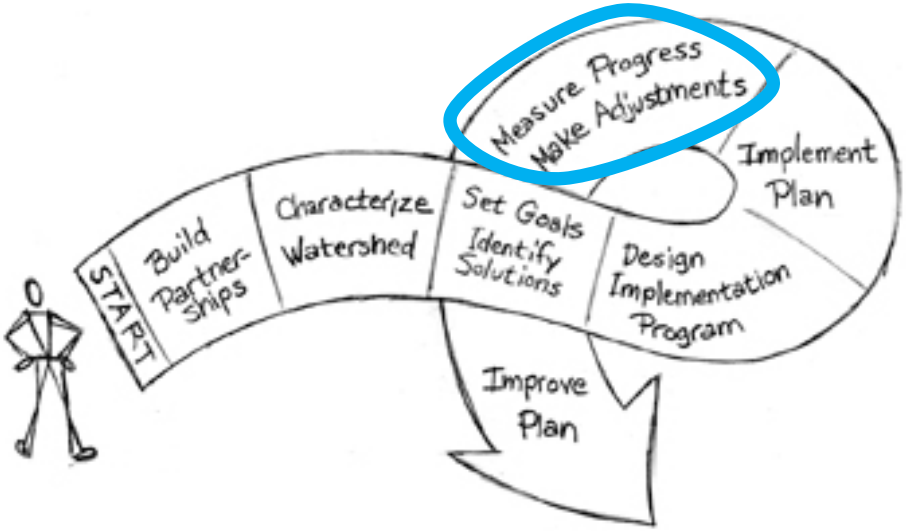


Image source: EPA, “Watershed Planning Process” http://iaspub.epa.gov/watershedplan/planningProcess.do?pageId=33&navId=33

Existing Watershed Based Plans in WV

Cacapon River: Lost River

Cheat River: Cheat River, North Fork of Blackwater River

Elk River: Lower Elk River

Greenbrier River: Second Creek

Guyandotte River: Upper Guyandotte River

Kanawha River: Morris Creek

Little Kanawha River: Montwood Lake

Monongahela River: Deckers Creek

West Run

New River: Wolf Creek

Potomac Direct Drains: Mill Creek of Opequon, Sleepy Creek

South Branch Potomac: Mill Creek

Tug Fork River: North Fork of Elkhorn Creek

Tygart Valley River: Three Forks Creek

Upper Buckhannon River

Upper Ohio River: Little Grave Creek

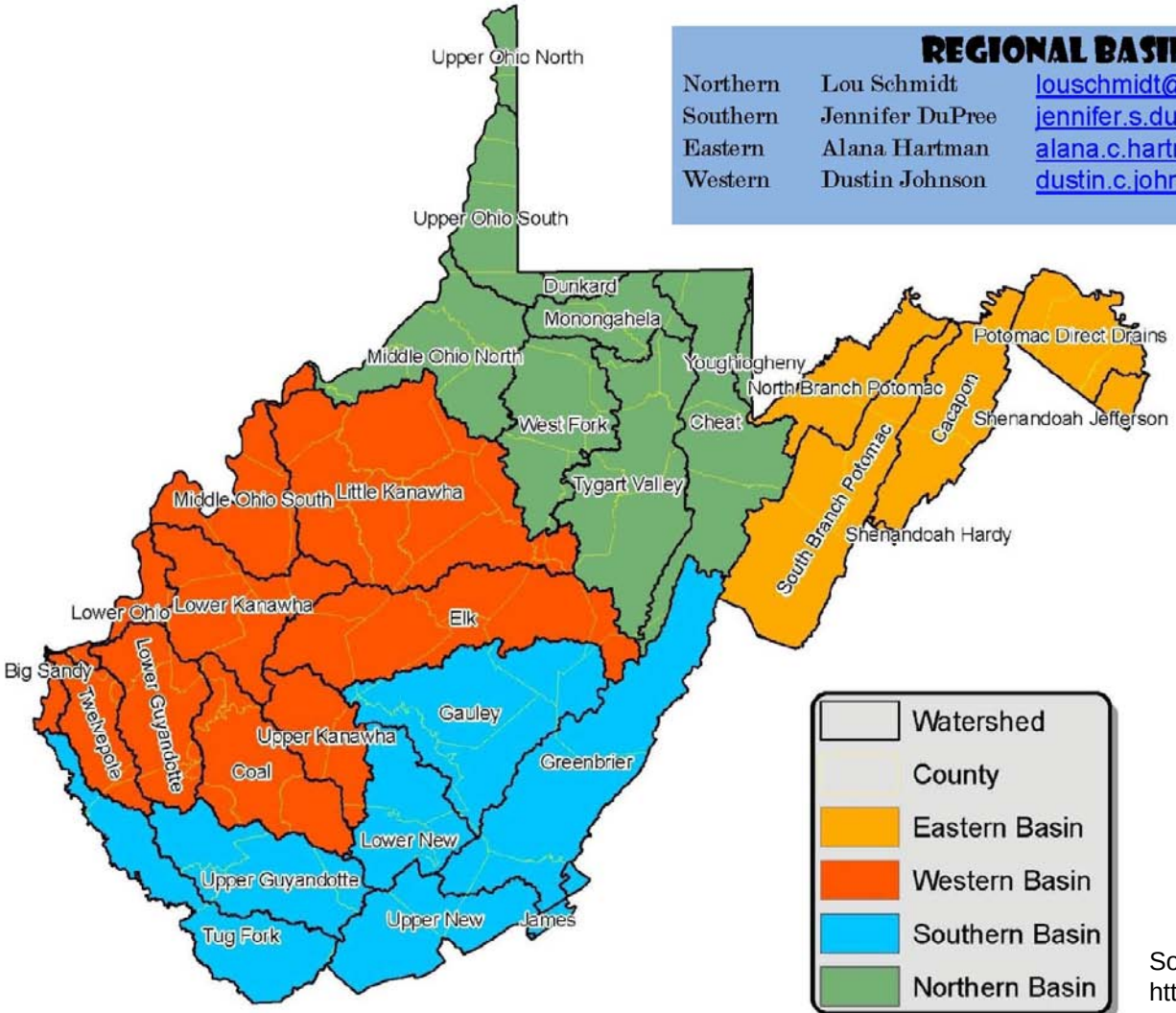
West Fork River: Lamberts Run

dep

west virginia department of environmental protection

Source: http://www.dep.wv.gov/WWE/Programs/nonptsource/WBP/Pages/ExistingWBP.aspx

Basin Coordinators



REGIONAL BASIN COORDINATORS

Northern	Lou Schmidt	louschmidt@frontiernet.net	(304) 783-4935
Southern	Jennifer DuPree	jennifer.s.dupree@wv.gov	(304) 465-1938 ext. 3070
Eastern	Alana Hartman	alana.c.hartman@wv.gov	(304) 822-7266 ext. 3623
Western	Dustin Johnson	dustin.c.johnson@wv.gov	(304) 926-0499 ext. 1098

Source:
http://www.dep.wv.gov/WWE/getinvolved/WSA_ProjTm/Pages/BasinCoordinators.aspx

Resources

- A User's Guide to Watershed Planning in Maryland (MD DNR)
  - http://www.dnr.state.md.us/watersheds/pubs/userguide.html
- EPA Watershed Plan Builder Tool and Planning
  - http://iaspub.epa.gov/watershedplan/watershedPlanning.do?pageid=48&navId=35
- EPA Watershed Academy
  - http://www.epa.gov/watertrain/index.htm
- Canaan Valley Institute
  - http://canaanvi.org
- Downstream Strategies
  - http://www.downstreamstrategies.com/