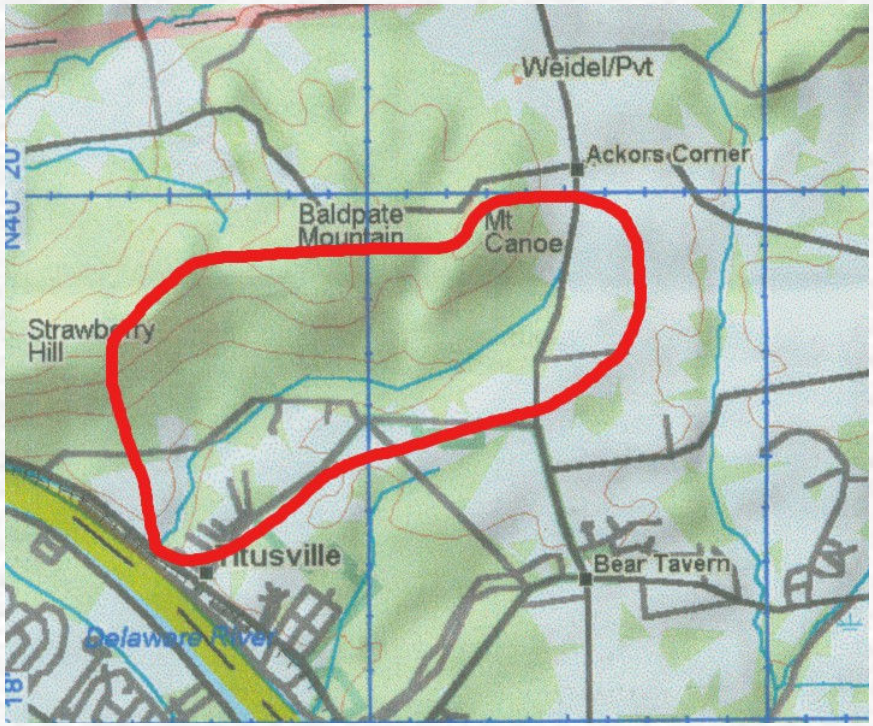
Visual Assessment Training

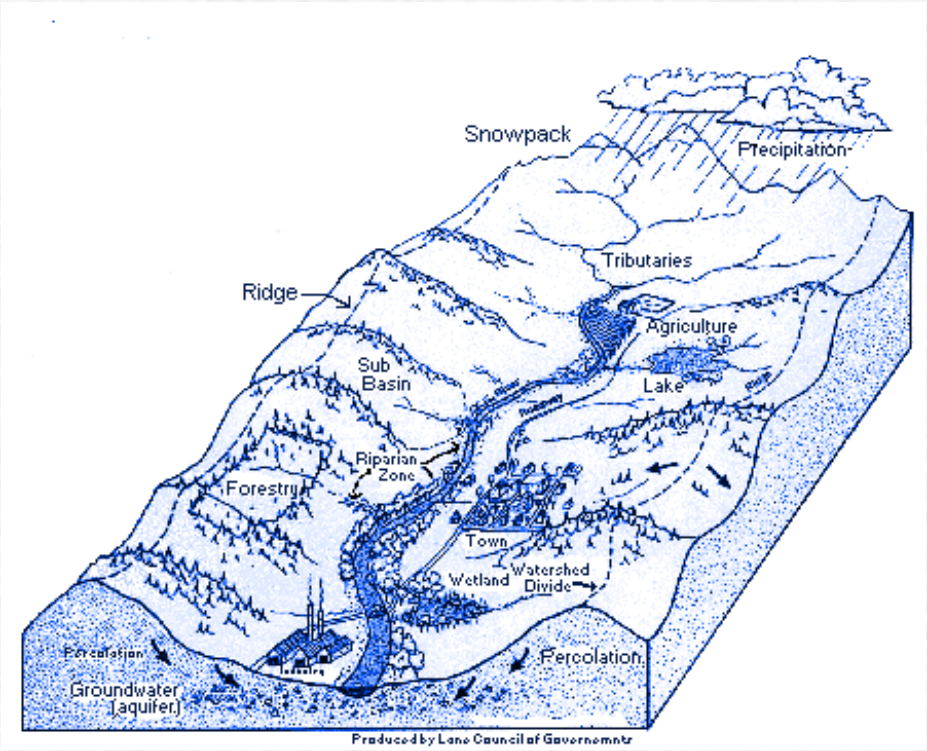
Today's Topics

- Introduction to Watershed Watch Network
- Creating a Quality Program
- Visual Assessment Protocol
- Other Considerations
- Assuring the Quality of your Data

What is a Watershed

- A watershed is the area of land, based on topography, that drains to a particular water body.





Watershed Watch Network

Mission Statement:

"To foster and develop a sense of stewardship toward local waters that serves to remind or give warning of the health of the watershed."

NJDEP Monitoring Programs

- NJDEP / USGS Cooperative Ambient SW & GW Networks
- Existing Water Quality Network
- Ambient Biomonitoring Network (820 stations, once every 5 years)
- Fish IBI

NJ WATERSHED AMBASSADORS PROGRAM

- Hosted by NJDEP Division of Watershed Management
- 20 Ambassadors in the 20 watershed management areas of the state
- Members work in host agency located in the management area of service
- Members act as a liaison between NJDEP and the community

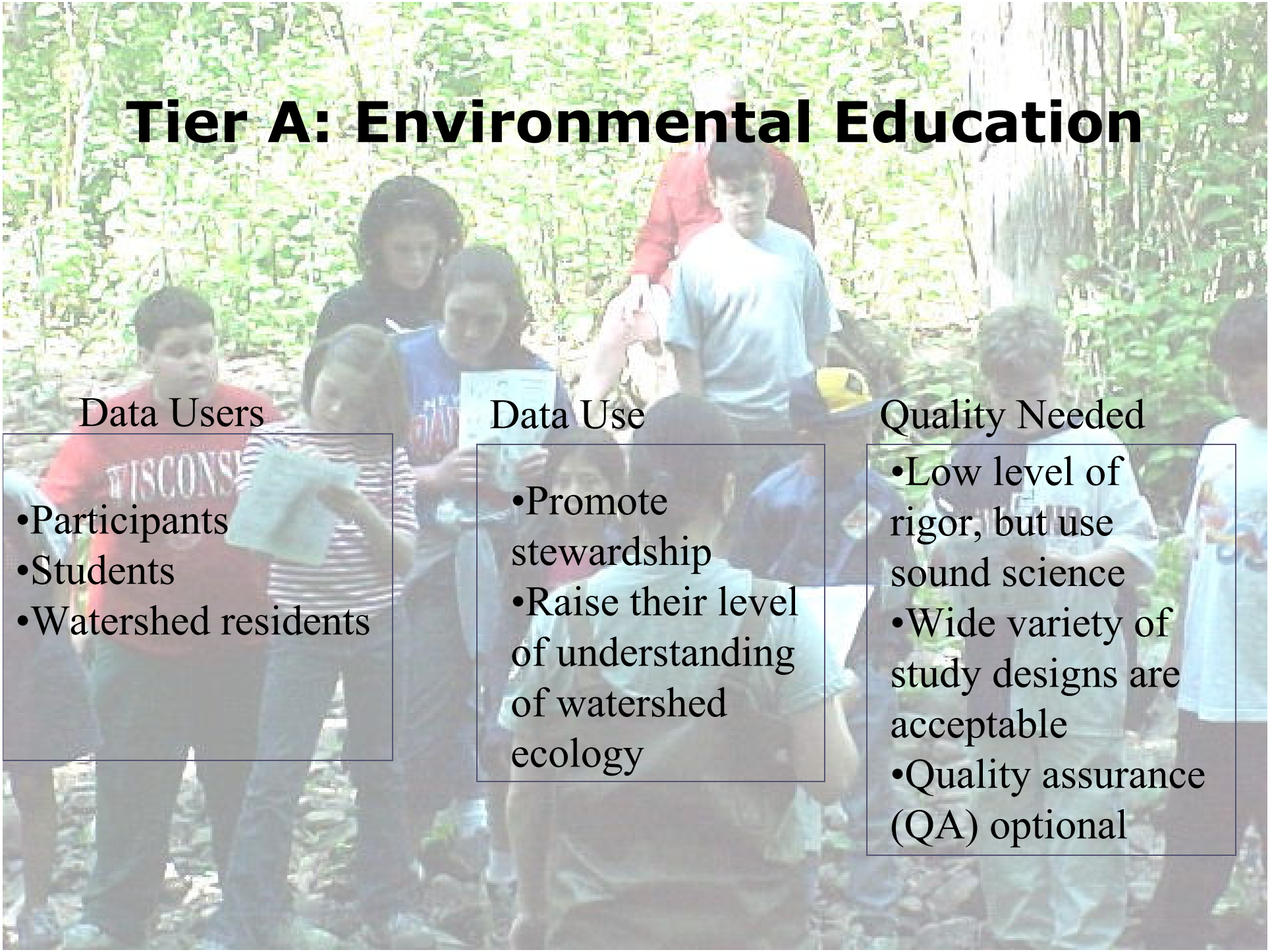
WHY Volunteers?

- Lack of Resources available to accurately assess NJ's waterways
- The Volunteers assess the waterways more frequently than the NJDEP can
- Dedicated Stewards of their waterways

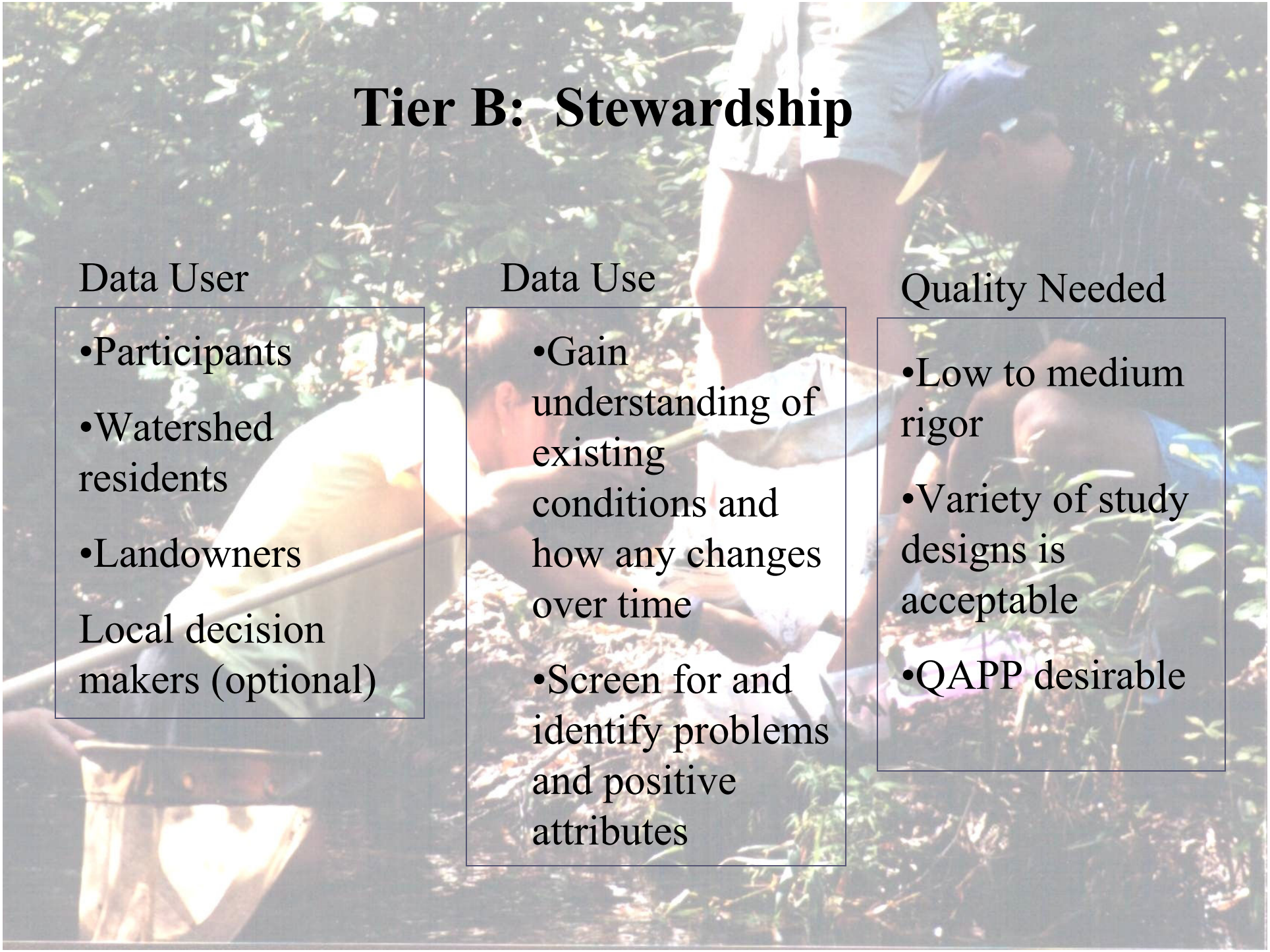
Options for Involvement

- Tier A: Environmental Education
- Tier B: Stewardship
- Tier C: Community Assessment
- Tier D: Indicators

Tier A: Environmental Education



Data Users	Data Use	Quality Needed
•Participants •Students •Watershed residents	•Promote stewardship •Raise their level of understanding of watershed ecology	•Low level of rigor, but use sound science •Wide variety of study designs are acceptable •Quality assurance (QA) optional



Tier B: Stewardship

Data User	Data Use	Quality Needed
•Participants •Watershed residents •Landowners Local decision makers (optional)	•Gain understanding of existing conditions and how any changes over time •Screen for and identify problems and positive attributes	•Low to medium rigor •Variety of study designs is acceptable •QAPP desirable

Tier C: Community and/or Watershed Level Assessment

Data Users	Data Use	Quality Needed
•Local decision-makers •Watershed association •Environmental organizations •Possibly DEP	•Assess current conditions •Track trends •Source track down of Nonpoint source pollution	•Medium level of rigor •Data needs to reliably detect changes over time and space •Study design is focused on pollution sources •QAPP required

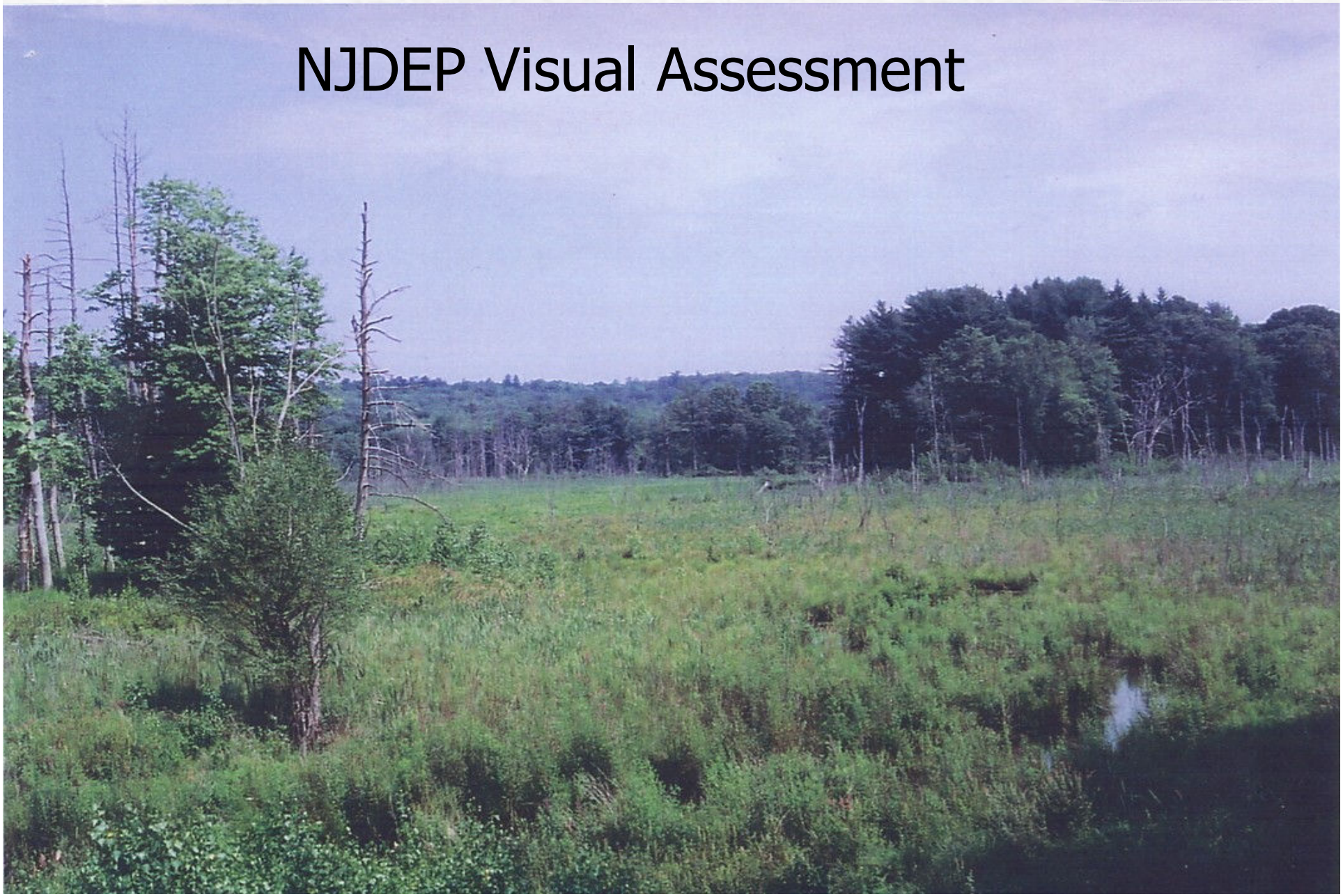
Tier D: Indicators (visual and biological assessments, and water quality)

Data Users	Data Use	Quality Needed
•NJDEP •Local decision-makers •Watershed associations ▪Environmental organizations	•Assess current conditions and impairments •Supplement agency data collection •Research •Evaluate best management practices (BMP) measures	•Medium to high level of rigor •Study design and methods need to be equivalent and recognized by agencies using data •Training required •QAPP required

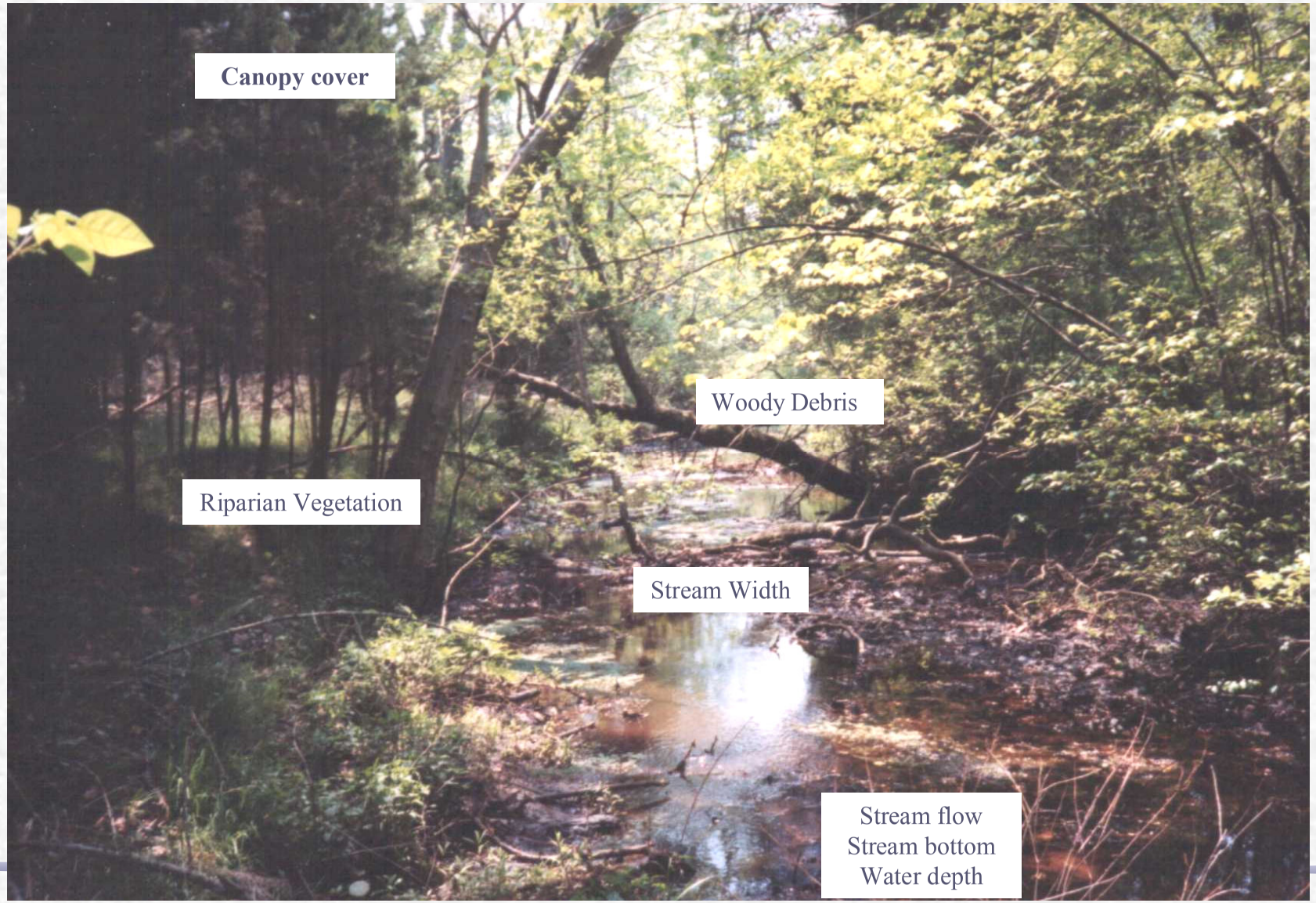
Creating a Quality Program

- What is your purpose?
- Will your monitoring activities fulfill YOUR needs?
- Will you data be accepted by the intended user?
- Do you have the necessary resources for your monitoring program?

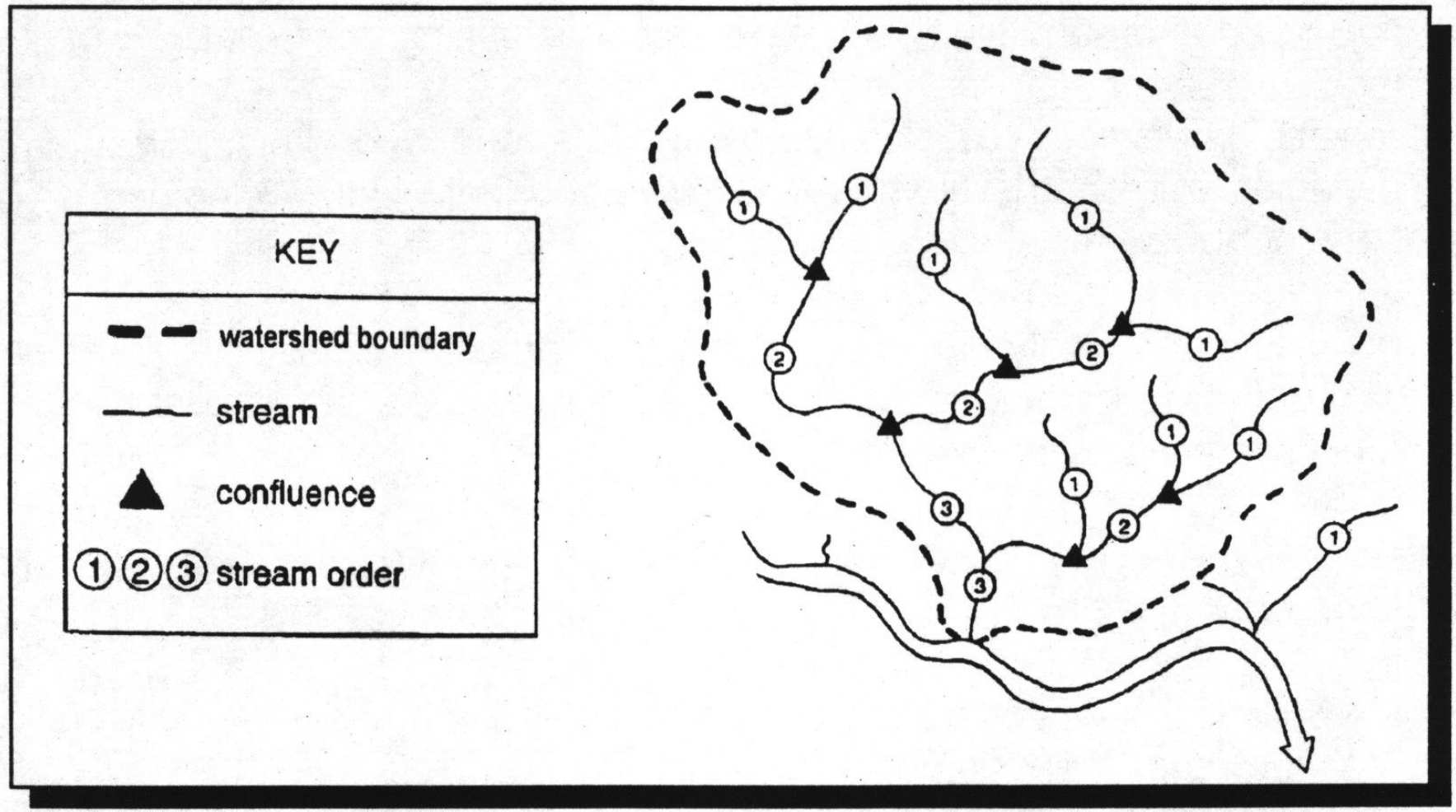
NJDEP Visual Assessment



What are we "Assessing"?



Stream Order



(Source: Schueler, 1995b)

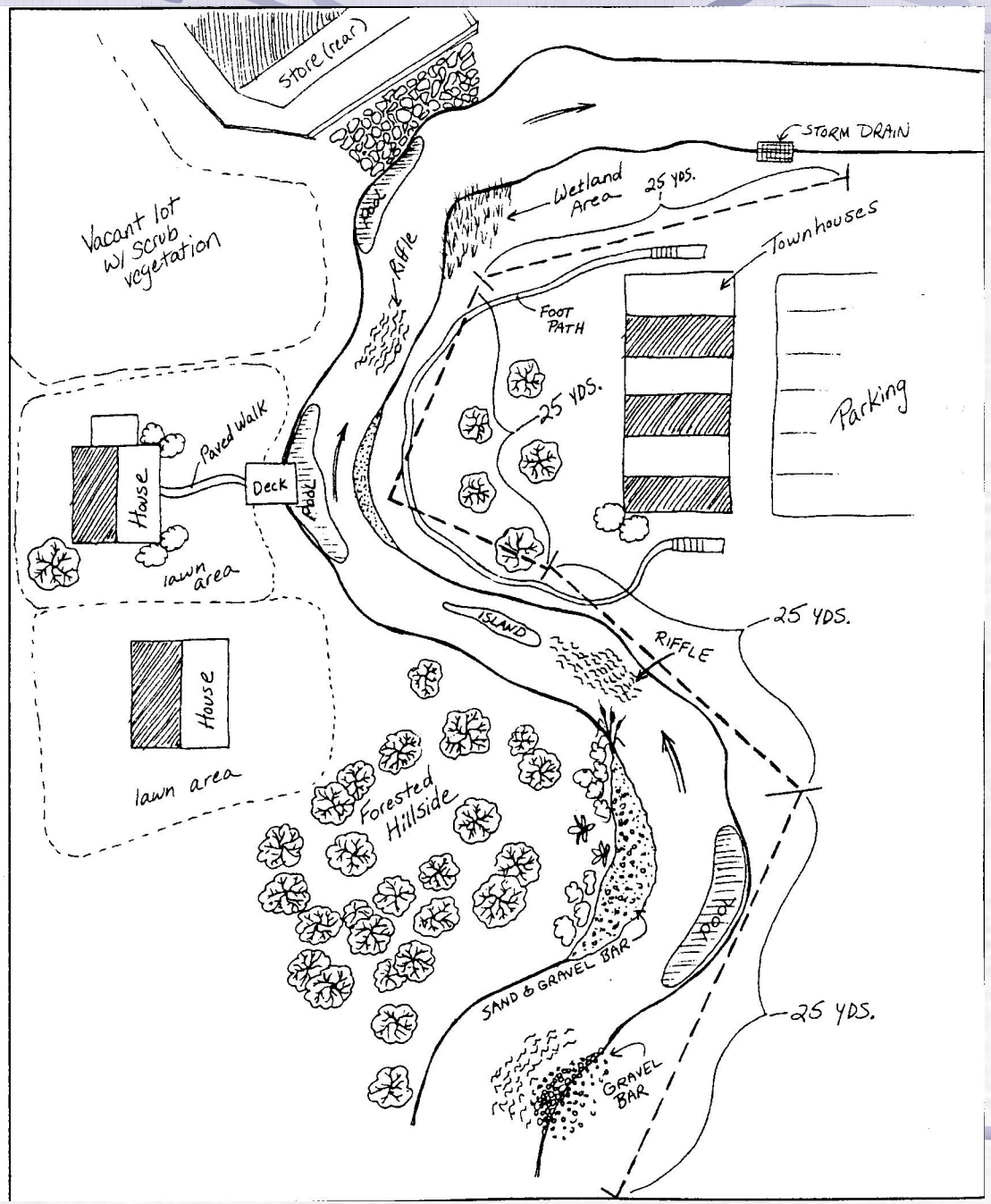
General Reach Sheet

Helps to Determine What Stream you are Assessing

Past and Present Weather

Sketch of the Stretch

Site Sketch



EPA, Volunteer Monitoring Manual,1995

Monitoring Sheet

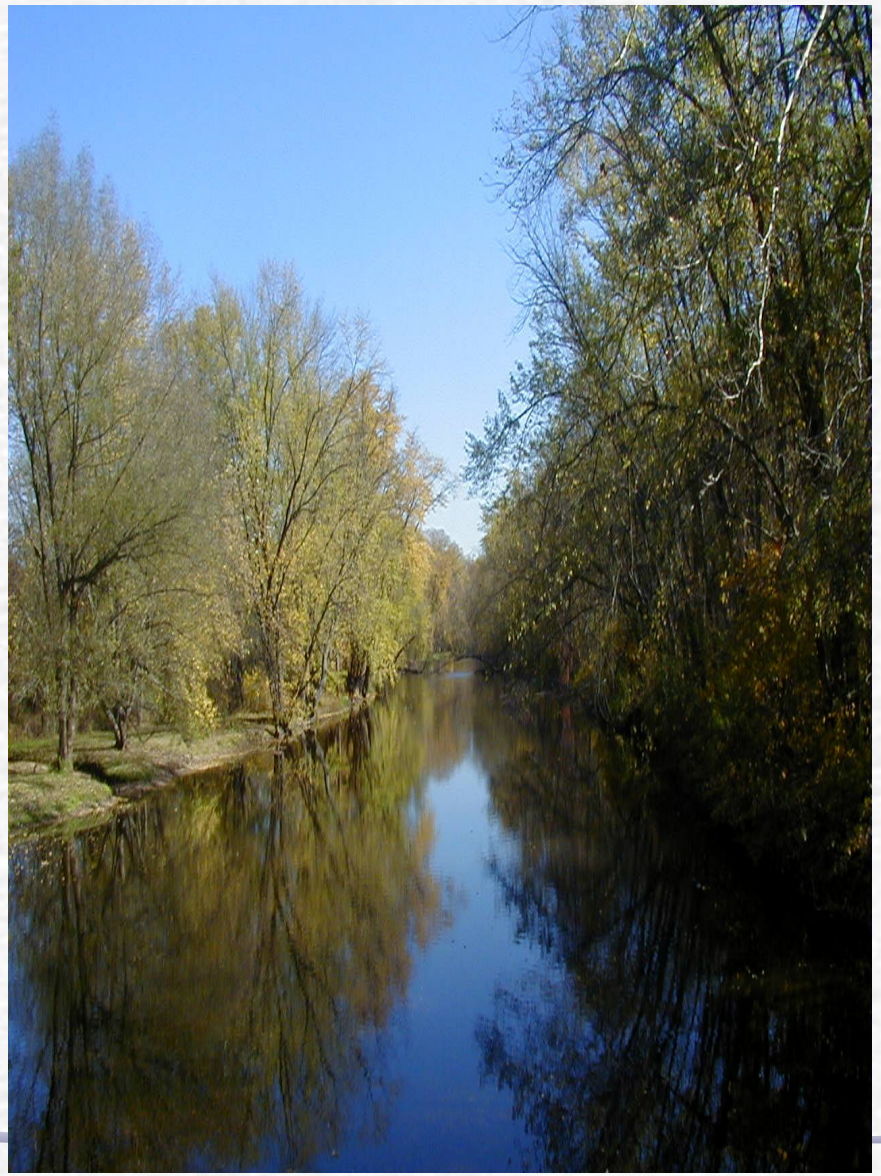
- Specific information about the site
- This sheet is to be filled out with the whole stream stretch in mind
  - Walk the whole stretch first, then fill in the sheet
  - Refer to your hand drawn sketch and your reference map

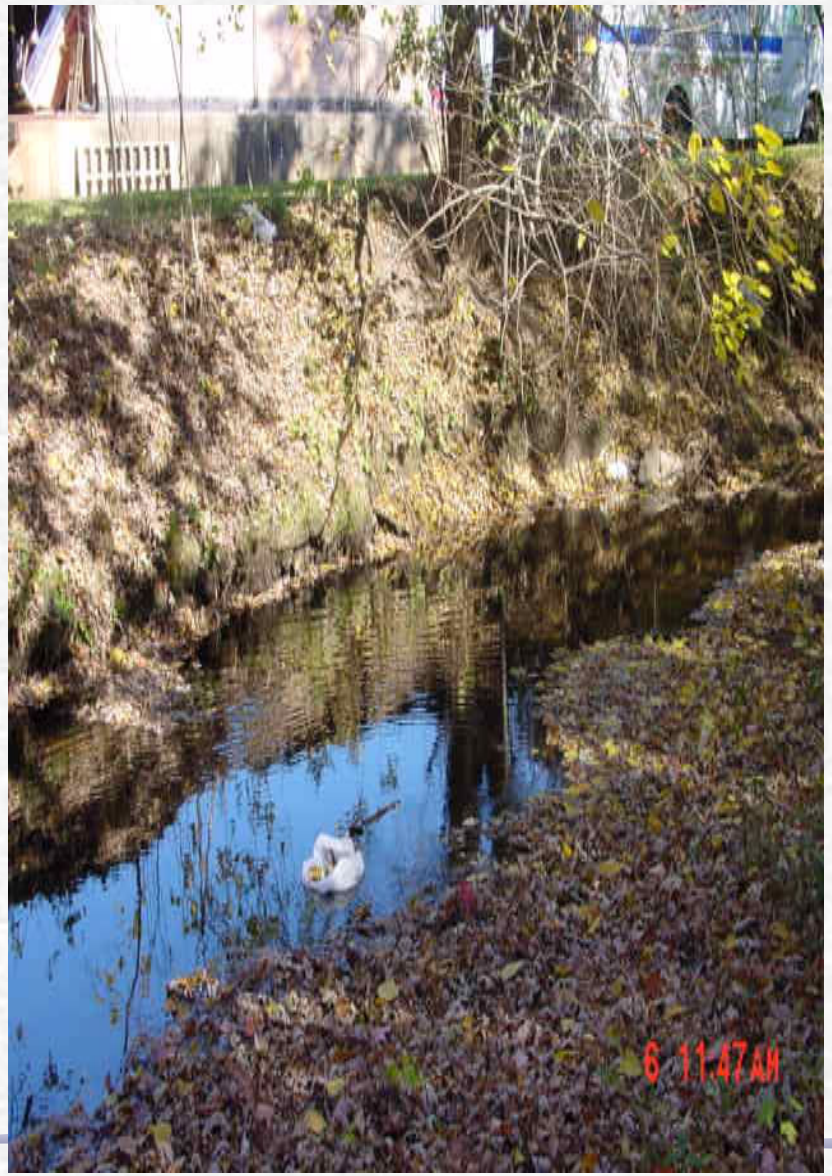
Stream Width, Velocity and Depth Measurements

-for wadable streams

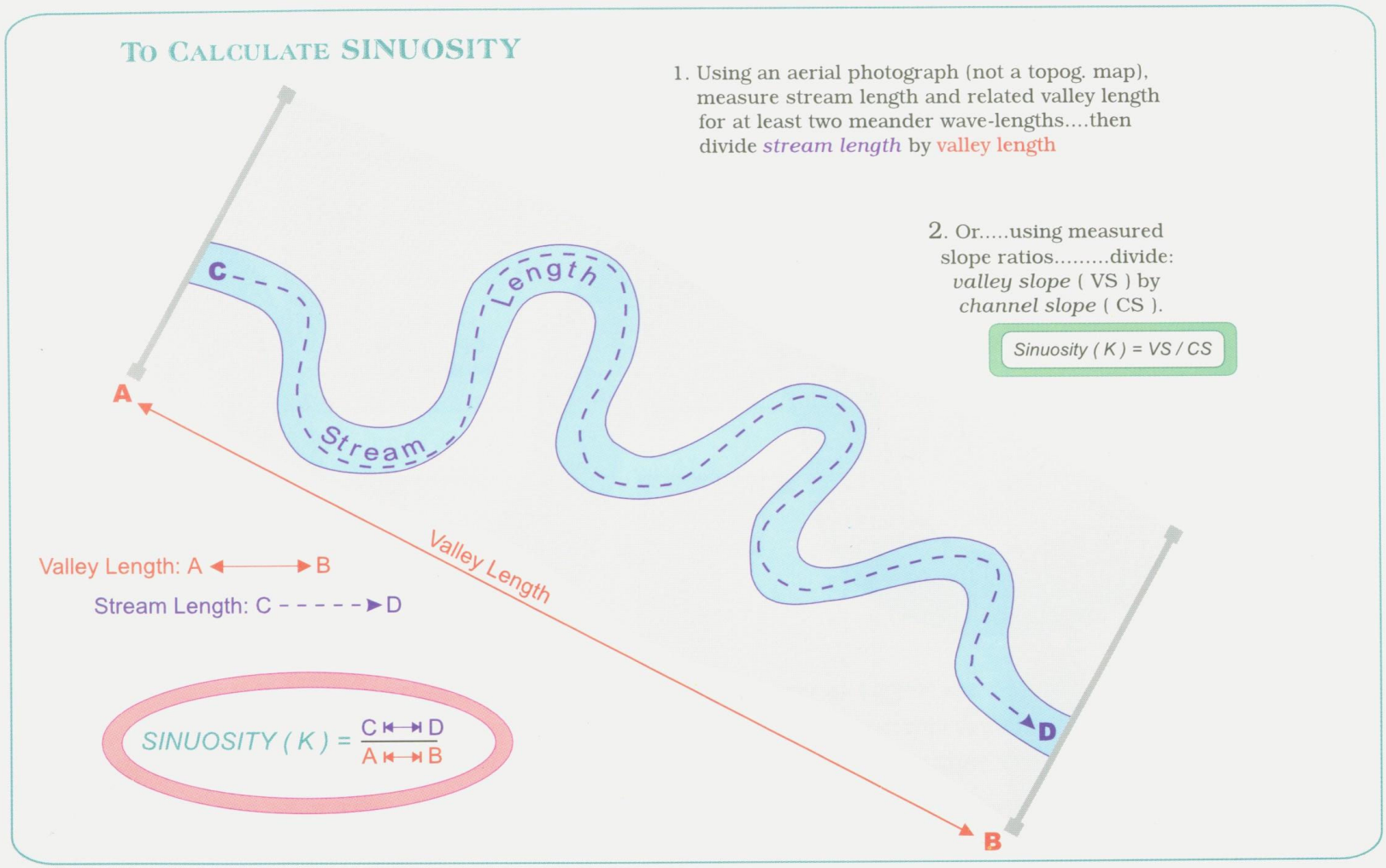
-for non-wadable streams

Stream Width





Stream Sinuosity



. Channel Sinuosity Calculations

Stream Flow

Flow Appearance of the surface of the Stream:

-slow, water does not appear to be moving

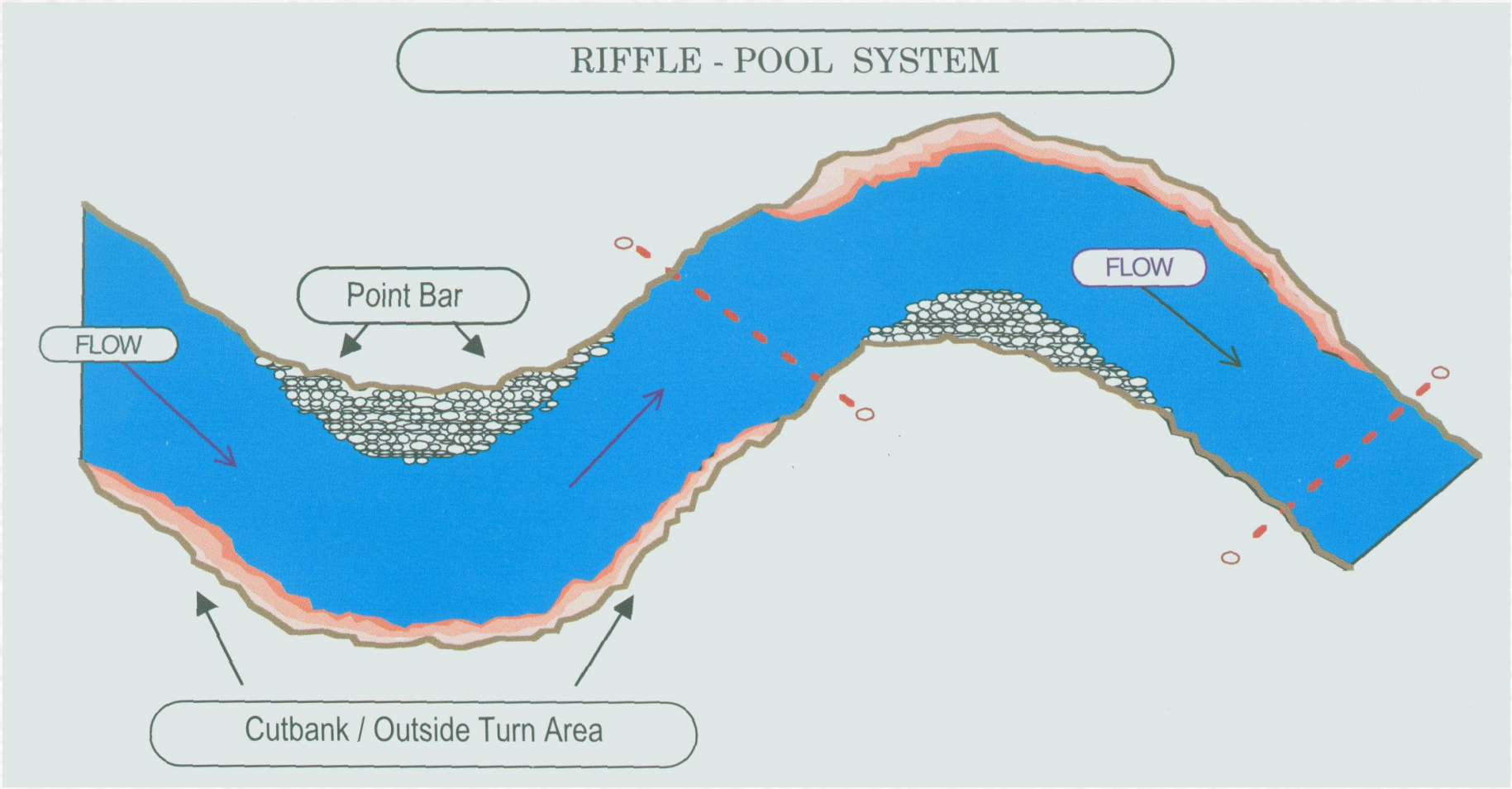
-moderate, moving but surface still appears flat

-swift, water is moving fast and surface is not flat

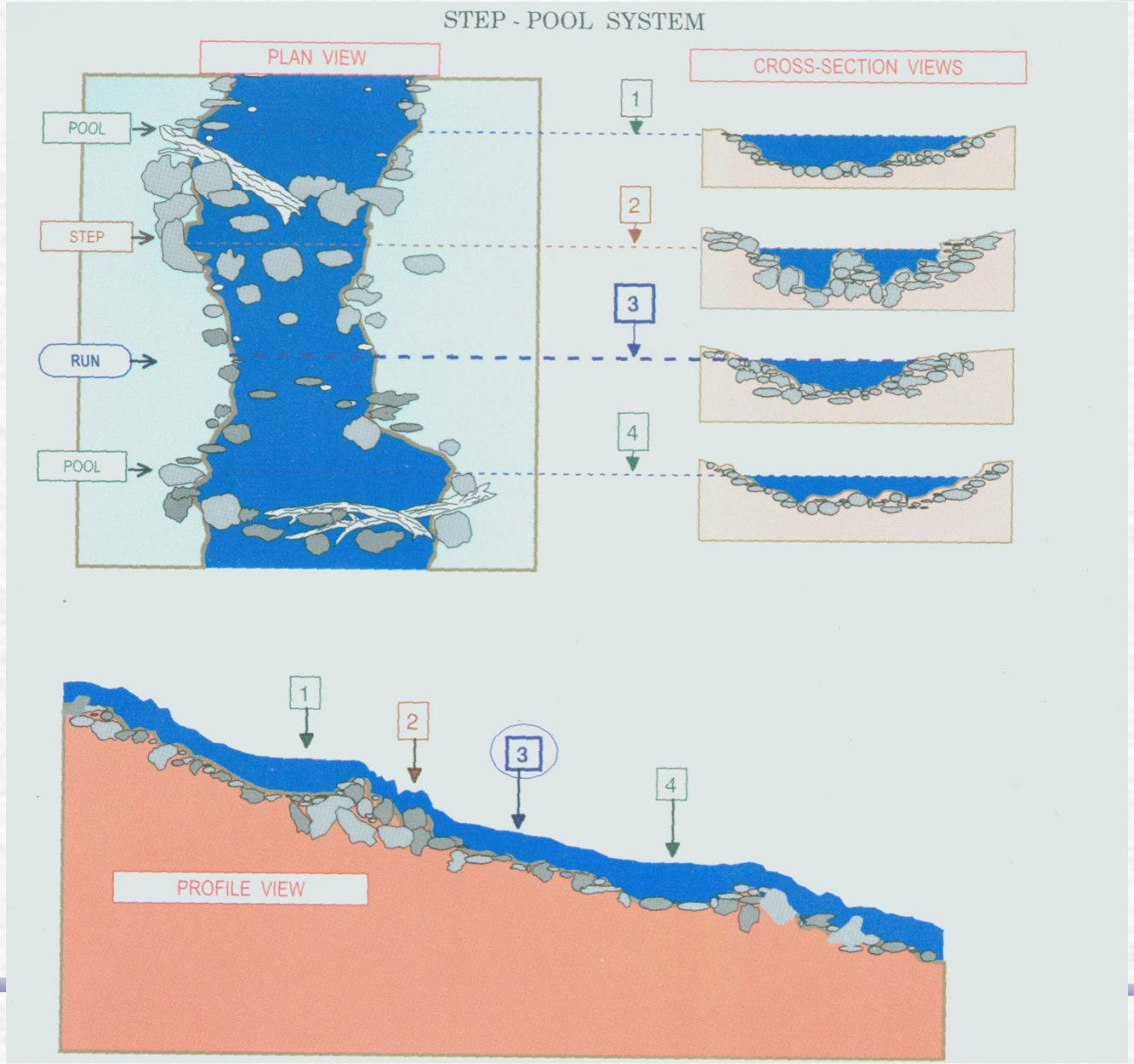
-combination, water flow appearance varies throughout the stretch

Stream Flow

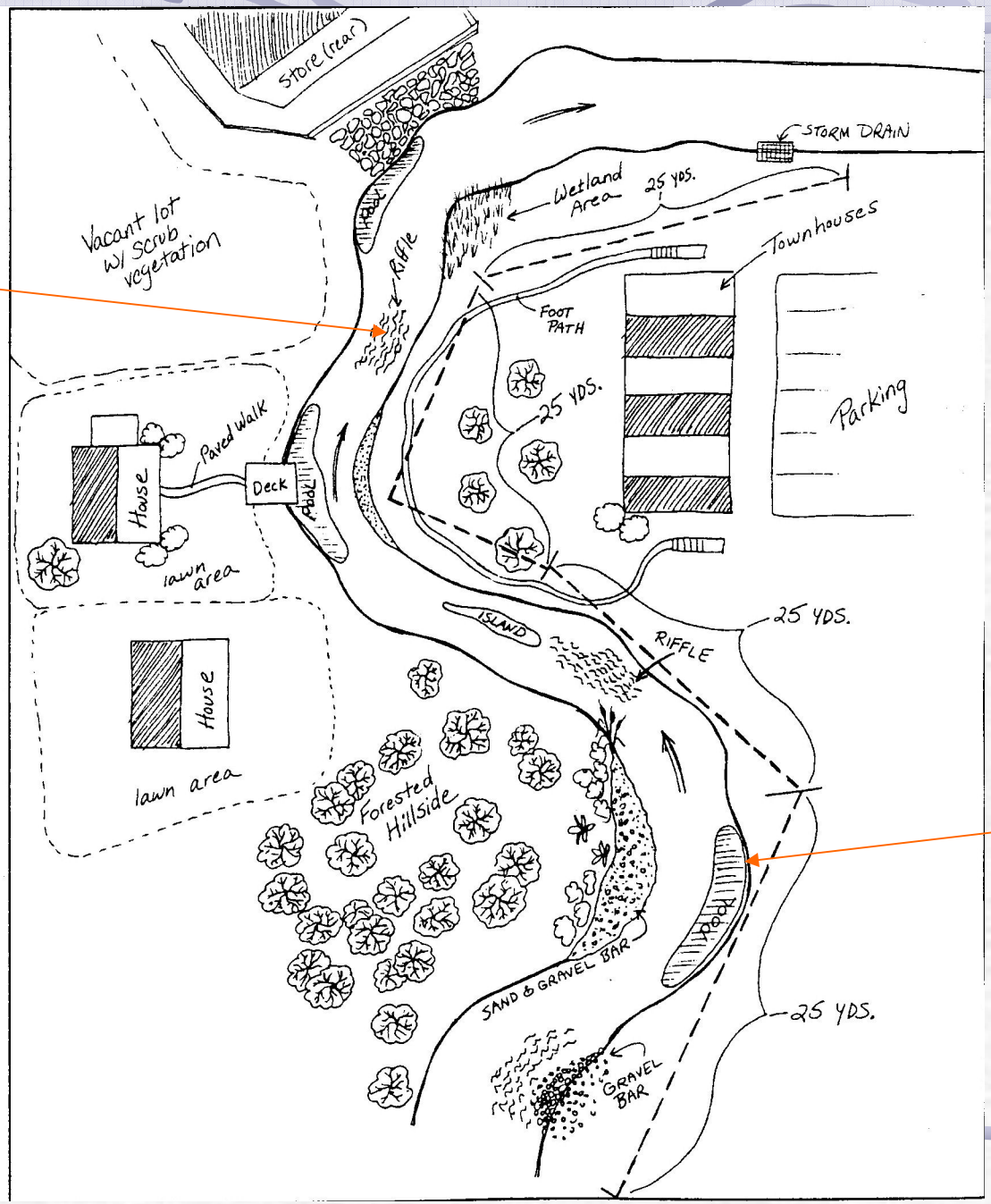
Pools and Riffles



Pools and Riffles (cont.)



Notice the Riffles & Pools on the map



EPA, Volunteer Monitoring Manual,1995

Stream Substrate

- Fine Particles (silt, clay, mud)
- Sand (less than 0.25 cm)
- Gravel (0.25 cm-5 cm)
- Cobble (5 cm-25 cm)
- Bedrock (solid unbroken rock)

Gravel Bottom

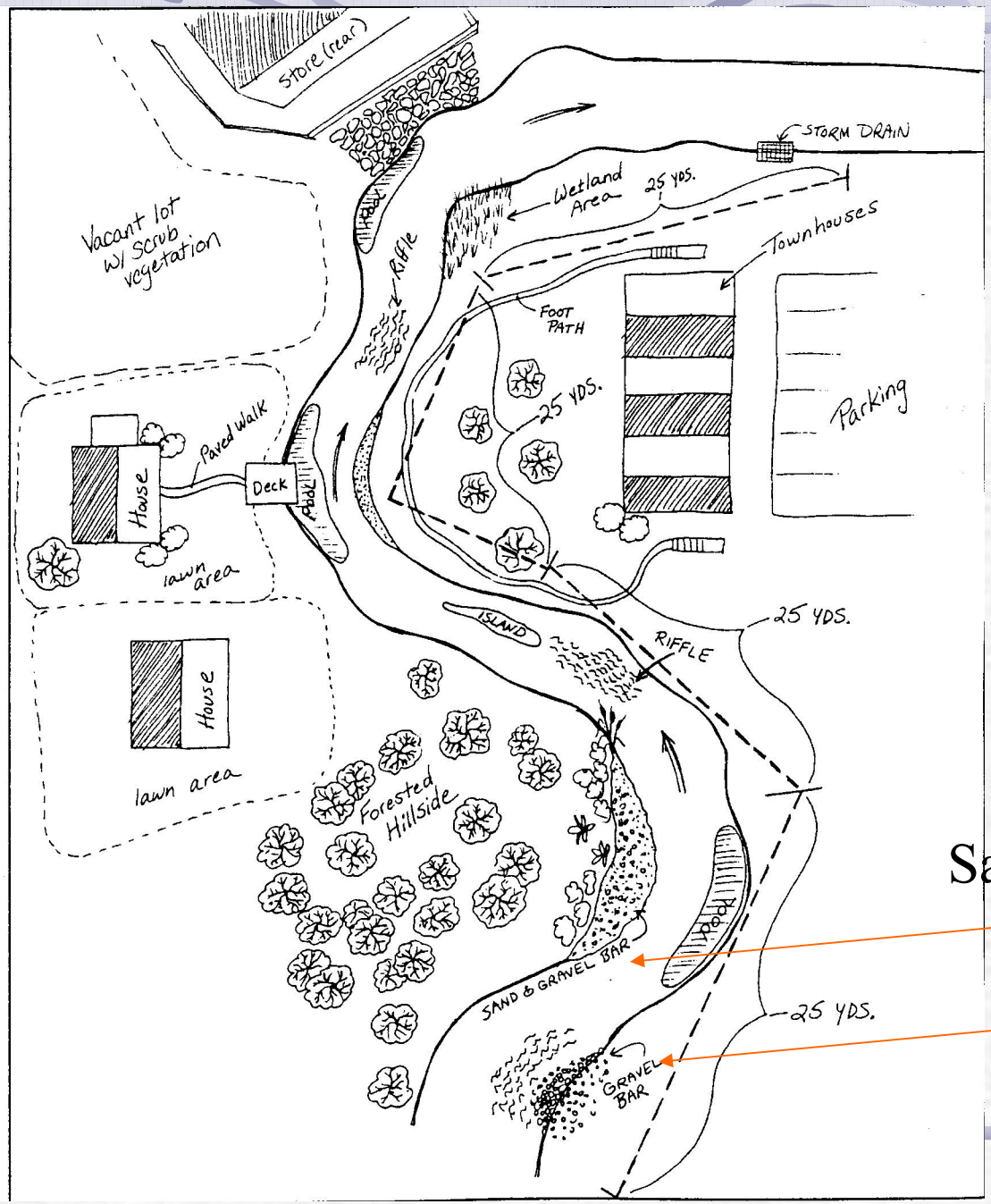
Muddy Bottom

Silt Covered Bottom

Bedrock Bottom

Other:Orange/Red

Site Sketch



Sand/gravel bar

EPA, Volunteer Monitoring Manual,1995

Stream Substrate Stability

- Loose
- Stable

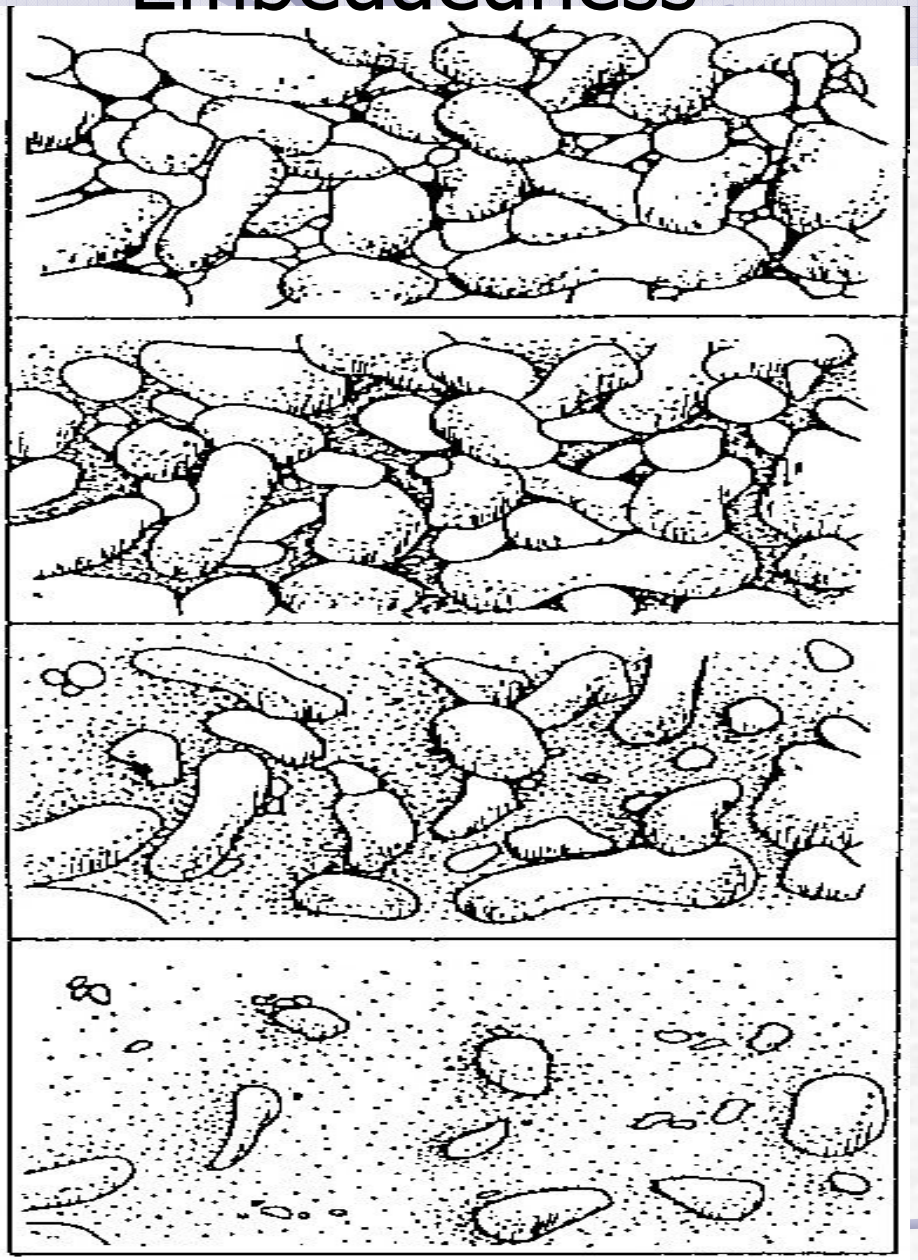
Two Types of Stream:

-High Gradient

-Low Gradient

Embeddedness

If you are in a low gradient stream you may not be able to rate embeddedness



0-25%

26-50%

51-75%

76% or greater

EPA, Volunteer Monitoring Manual,1995

Sediment

Rate Sediment for Low Gradient Streams Instead of Embeddedness

None

Light

Moderate

Severe

Bank Stability

Stable, less than 5% of the bank affected

Moderately Stable,5-30% of bank in reach is eroded

Moderately Unstable- 31-60% of bank in reach is eroded

Unstable- 60% or greater is eroded

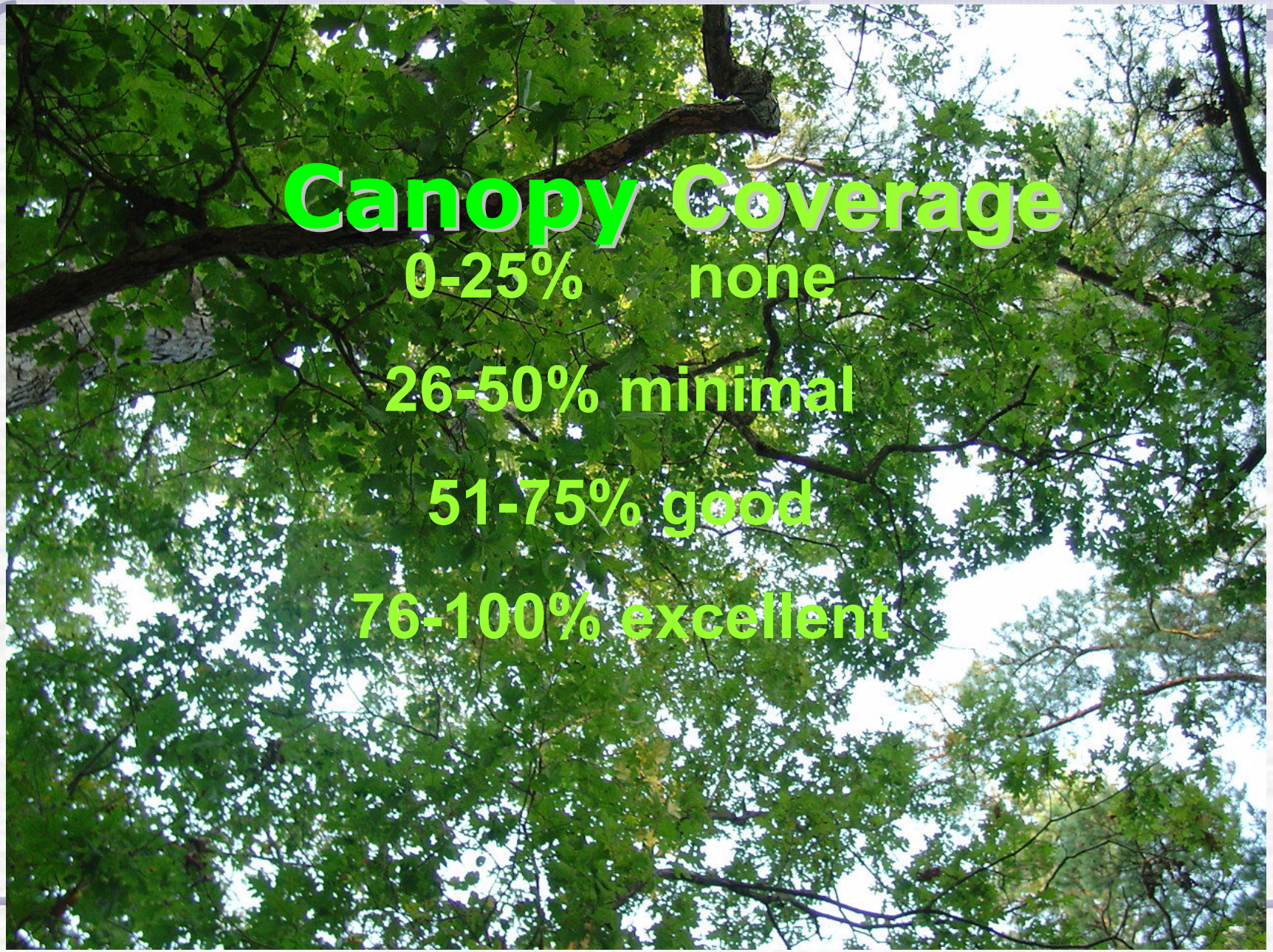
Look at the left and right banks separately

Bank Erosion

Bank Erosion

Bank Erosion

Under-cut Bank Erosion


Canopy Coverage
0-25% none
26-50% minimal
51-75% good
76-100% excellent

No Canopy Cover (0-25%)

0-25%

75-100%

75-100%

Riparian Vegetation

>50 feet wide

35-50 feet wide

15-35 feet wide

<15 feet wide

Look at both the left and right banks

10:23AM

Woody Debris

- None
- In spots
- Heavy throughout reach

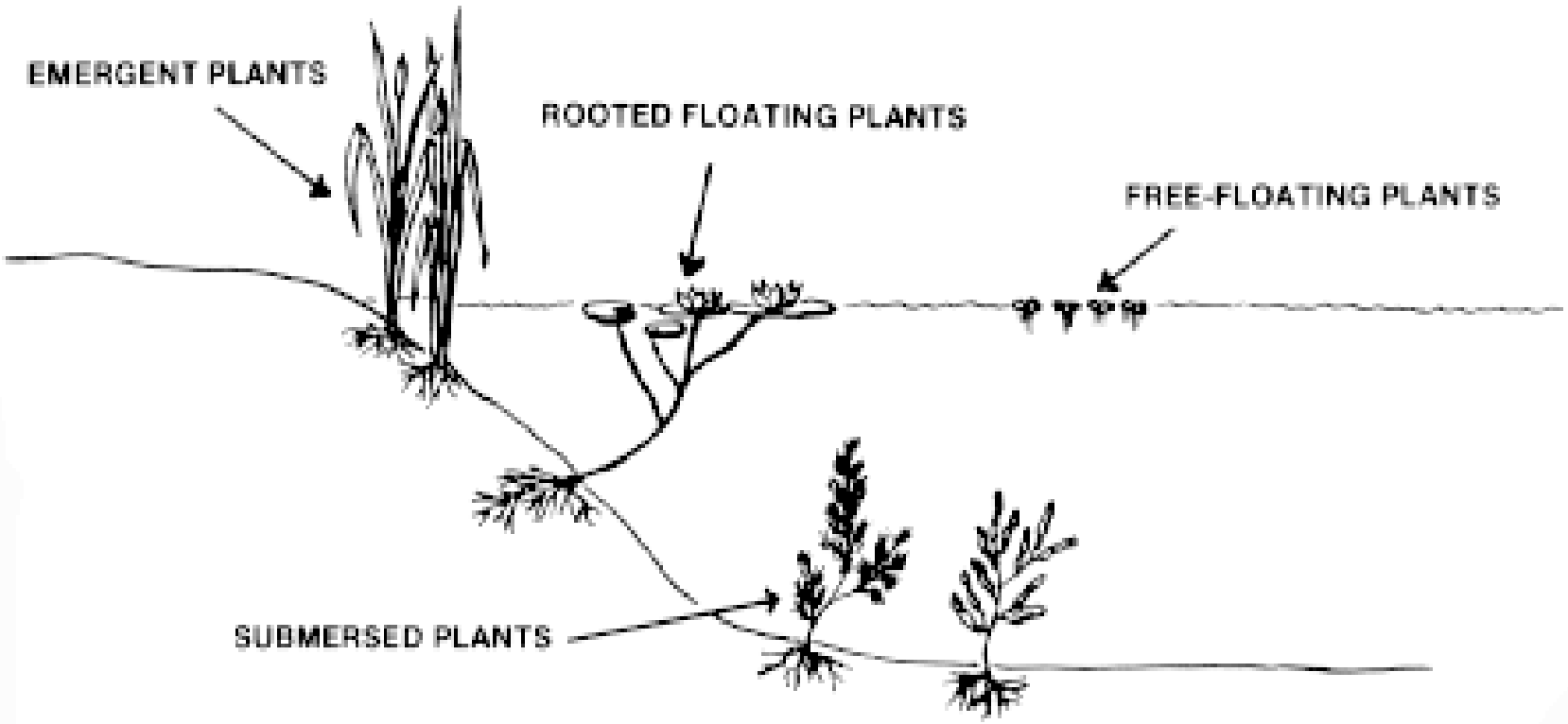
No Woody Debris

Some Woody Debris

Some Woody Debris

Heavy Woody Debris

Predominant Aquatic Vegetation

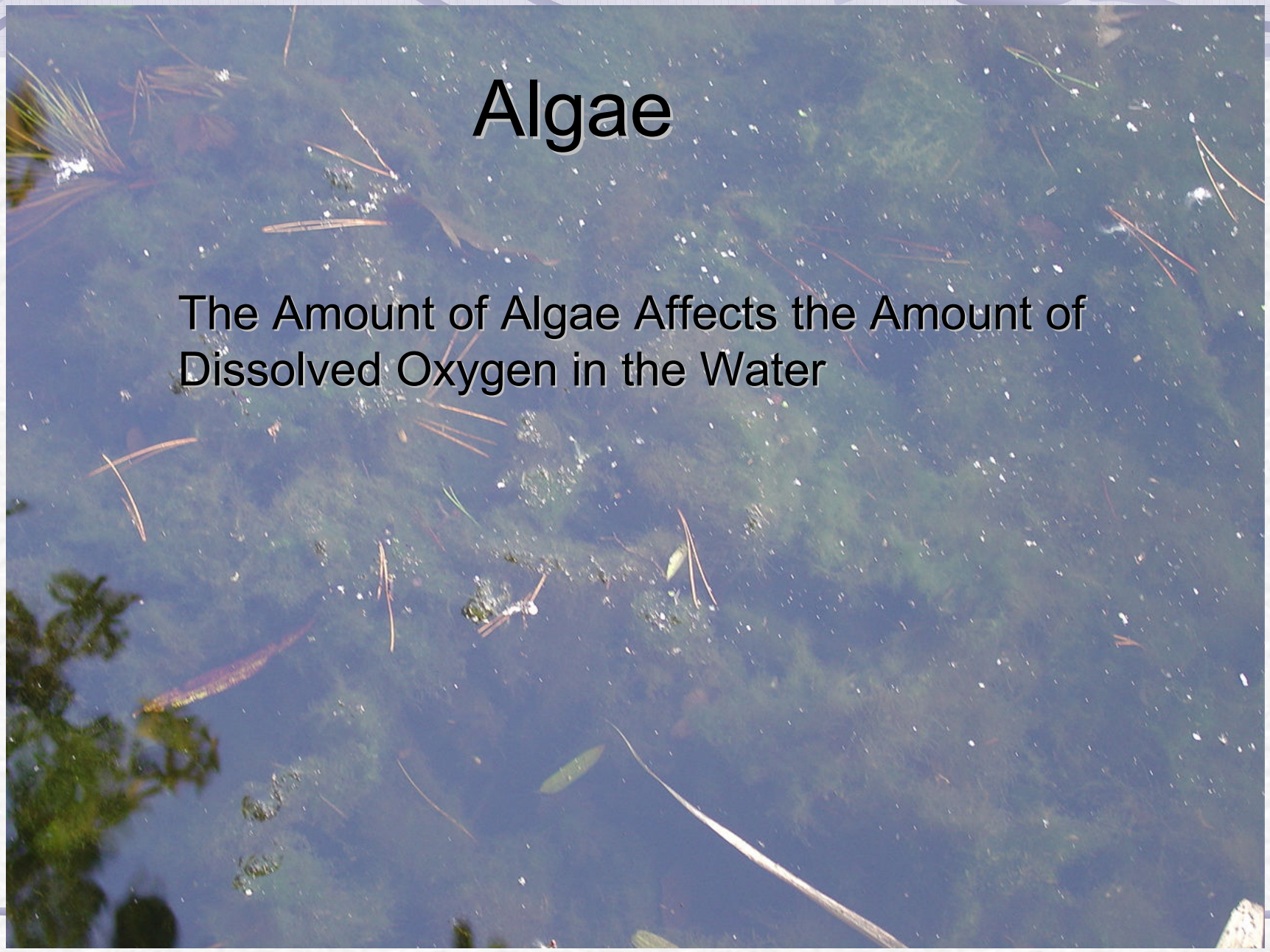


Source: North Central Regional Extention Publication No. 241, Carole A. Lembi, Aquatic Weed Specialist

Submerged Aquatic Vegetation

Free Floating Vegetation

Emergent Vegetation

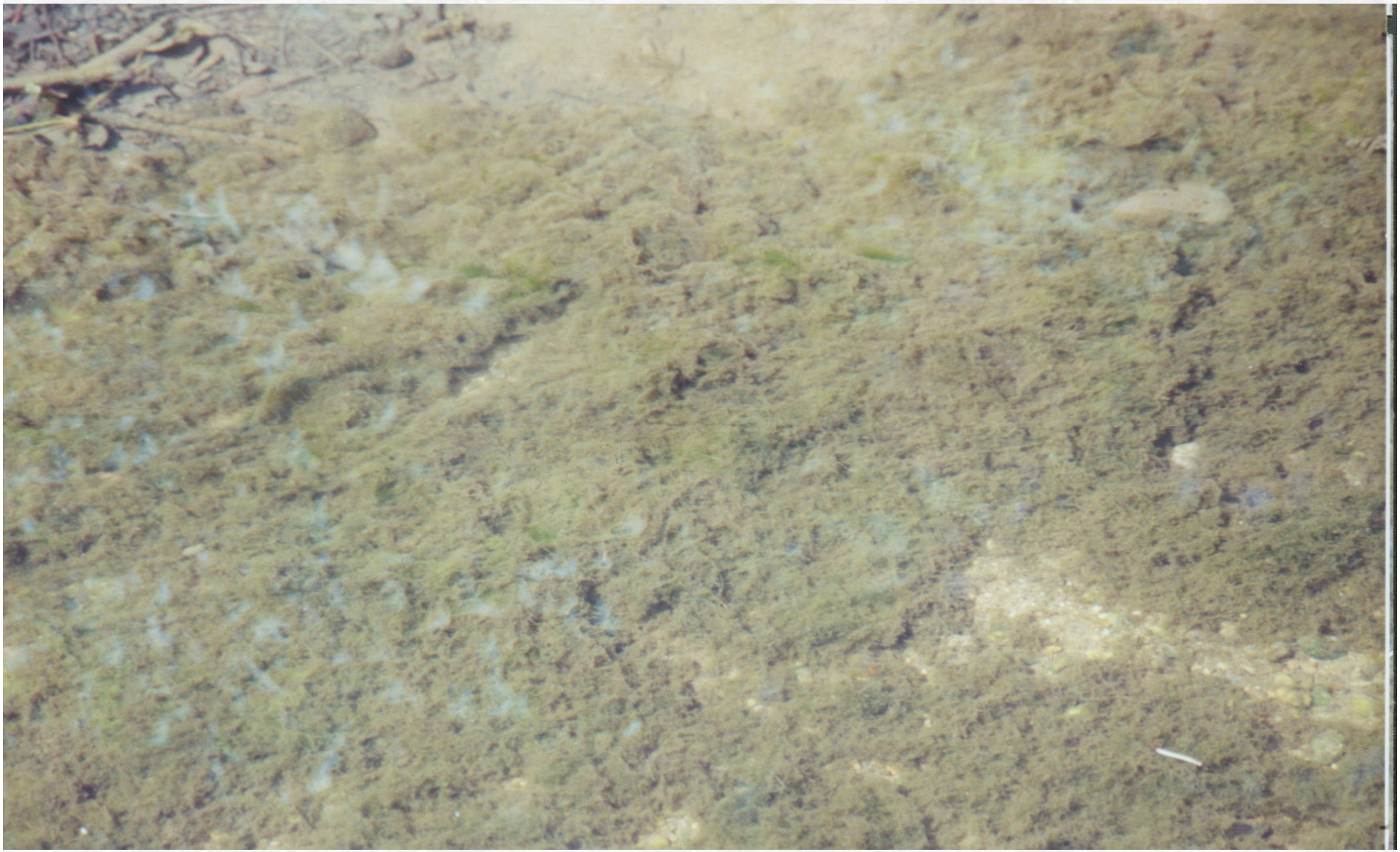


Algae

The Amount of Algae Affects the Amount of Dissolved Oxygen in the Water

Algae on the Streambed

Algae on the Streambed



Stream Alteration

- No channelization
- Channelization around bridges, etc.
- Channelized

Channelized

Partially Channelized

Channelized

Partially Channelized

Structures

Bridges

Culverts

Dams

Other

Dam

Bridge

Culvert

Outfalls

Stormwater

CSO (Combined Sewer Overflow)

NJPDES (New Jersey Pollutant Discharging Elimination System)

Other

Stormwater Outfall

Outfall

CSO

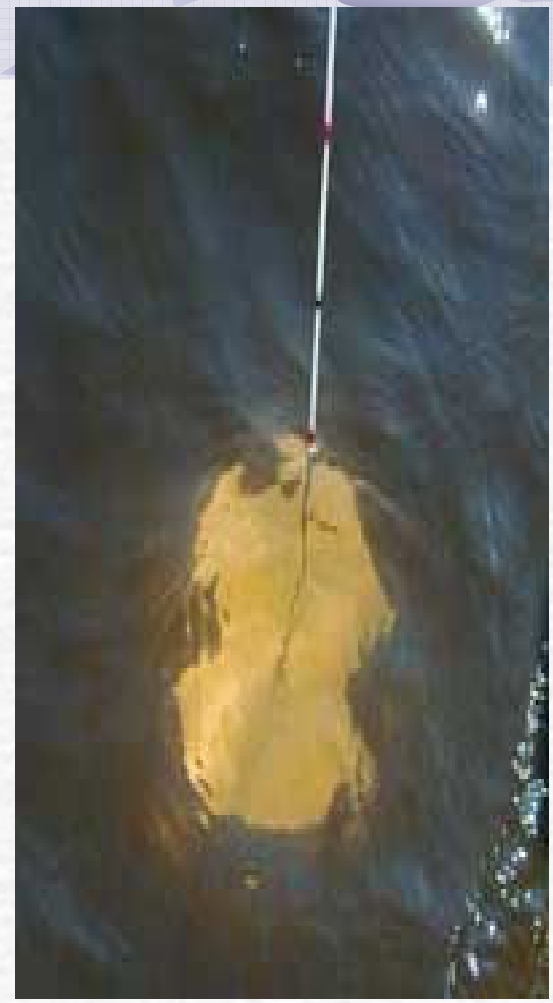
Water Conditions

Odors

&

Color/Clarity

Clear



Tea Colored

Muddy

Milky

Surface Coating

None

Oily*

Foam*

Scum*

Other

*sometimes natural

Oily

Foam

Scum

Potential Sources of NPS

Agriculture
Nurseries
Construction
Development
Residential Lawns
Septic Systems
Industrial Lots
Commercial Lots
Run-off from impervious cover
Run-off from fertilization of fields
Animal Waste
Landfills, Dumps
ETC…….

Streamside Land Use

Drainage Ditches

Other Observations

Site Selection

- Coordinate with the Watershed Ambassador or the Volunteer Monitoring Coordinator
- Pick a stream near your home or of particular interest to you, maybe where you fish, hike or hunt
- The Division also has sites that need additional visual data

Also consider…

- How will you cover the stretch, walking along the side, in the stream or canoeing
- The distance that you can physically cover safely
- The terrain that you can physically traverse safely
- Public access points

How often should I go out to my site?

- There is no minimum or maximum, but it is recommended that you go out 4 to 6 time per year
- Once in each season, one low flow condition and one high flow (flood, after the water goes down)

SAFETY ISSUES

- **Always monitor with at least one other person**
- **Be aware of recent weather conditions and how it affects the portion of stream being sampled**
- **Be aware of wildlife and vegetation in the area**
- **Take extra precautions to assure you are not considered “fair game” during hunting season**

What do you think are some safety concerns?

WHAT TO BRING IN THE FIELD

- **Water & snacks**
- **Sampling equipment**
- **Maps/Compass**
- **Field Guides**
- **Camera**
- **Binoculars**
- **GPS**
- **Data Sheet**
- **Pencil, pen**
- **Clipboard**
- **Appropriate clothing: sturdy shoes, sweaters**
- **A sense of adventure**

❖ ***Safety Equipment,*** **i.e. sunscreen, foul weather gear, first aid kit, bug repellent, cell phone or partner**

Liability

- While providing data for NJDEP, Volunteer monitors are not officially representatives of NJDEP
- NJDEP is not liable for any event that occurs during monitoring

PRIVATE PROPERTY

- Be aware that stream bottoms and beds may be privately owned

- Do not trespass

- Property owners should be sent letters requesting access for stream sampling

- Carry notice of permission and a water monitor identification card for the stream

Data Submittal

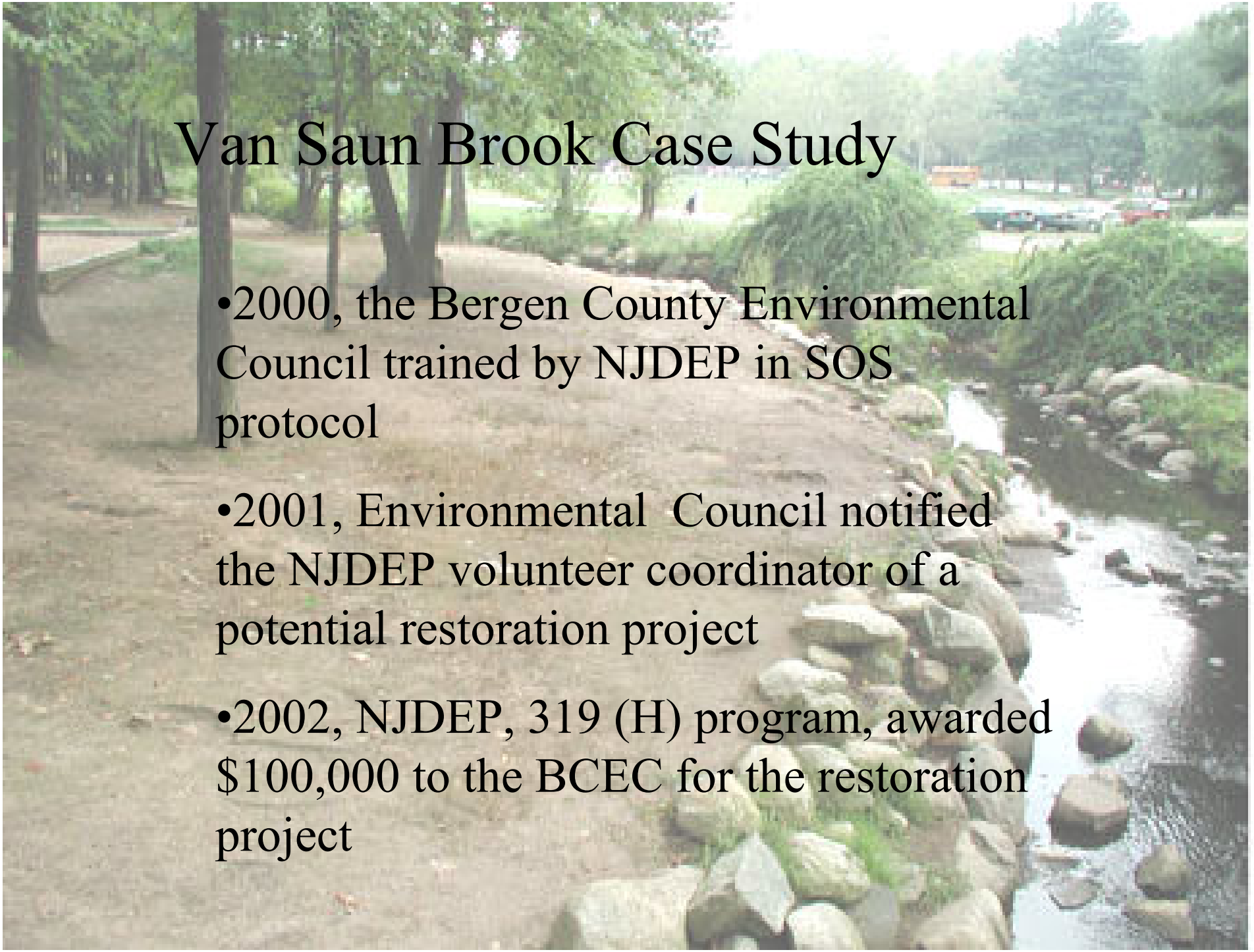
- If you chose to submit data to the NJDEP you will need to contact the Volunteer Monitoring Coordinator, Danielle Donkersloot, 609-292-2113 or danielle.donkersloot@dep.state.nj.us
- The Volunteer Monitoring Coordinator will serve as the clearinghouse for all volunteer collected water monitoring data
- Your sampling collection methods will be checked and audited by the Volunteer Monitoring Coordinator

Potential Uses for Watershed Watch Volunteer Data

- Education
- Problem Identification
- Local Decisions
- Research
- NPS Assessment
- Watershed Planning/Open Space acquisition
- Identification of potential projects
- Monitoring the success/failure of restoration projects

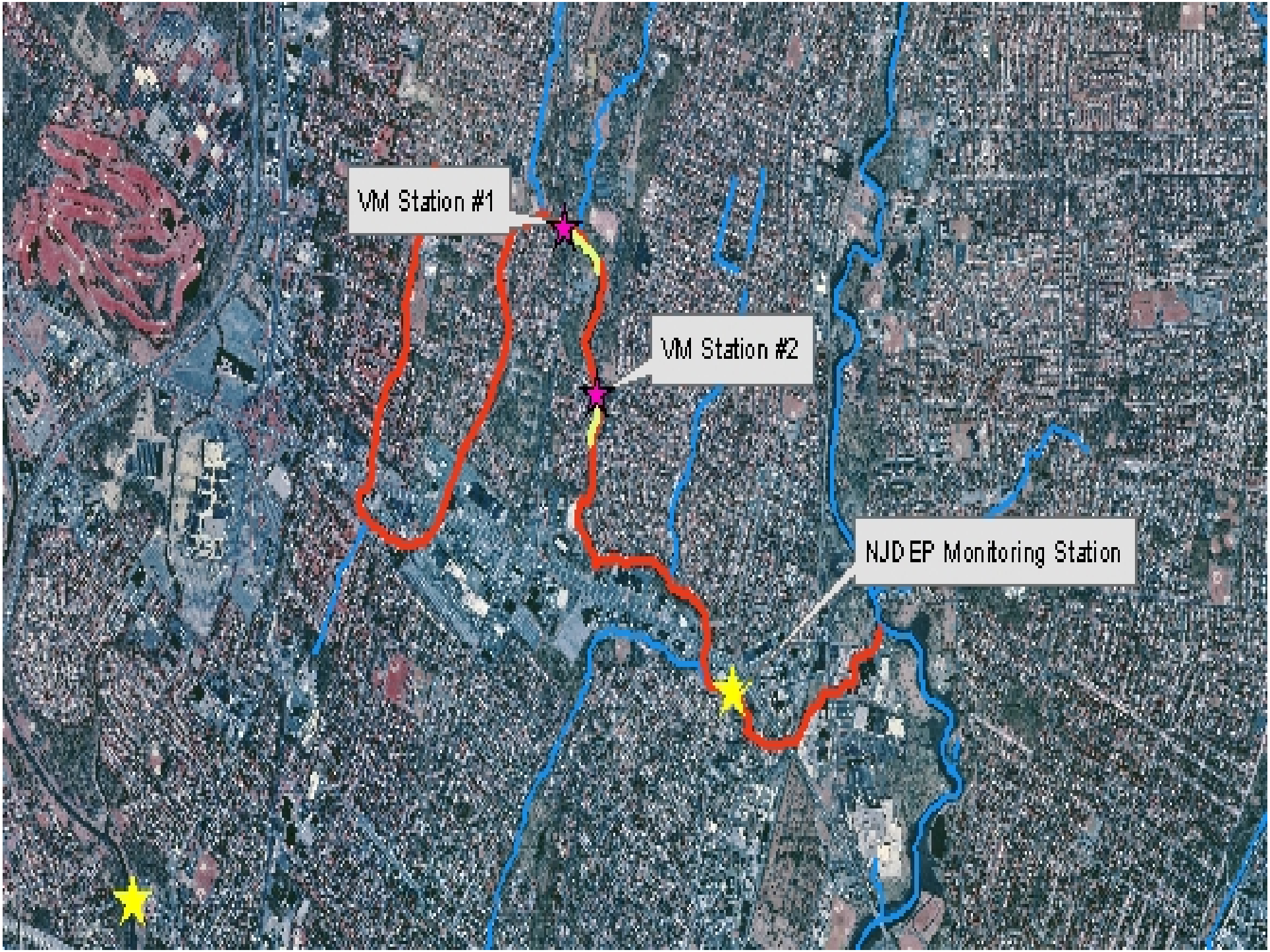
Who Will Use the Data in the NJDEP?

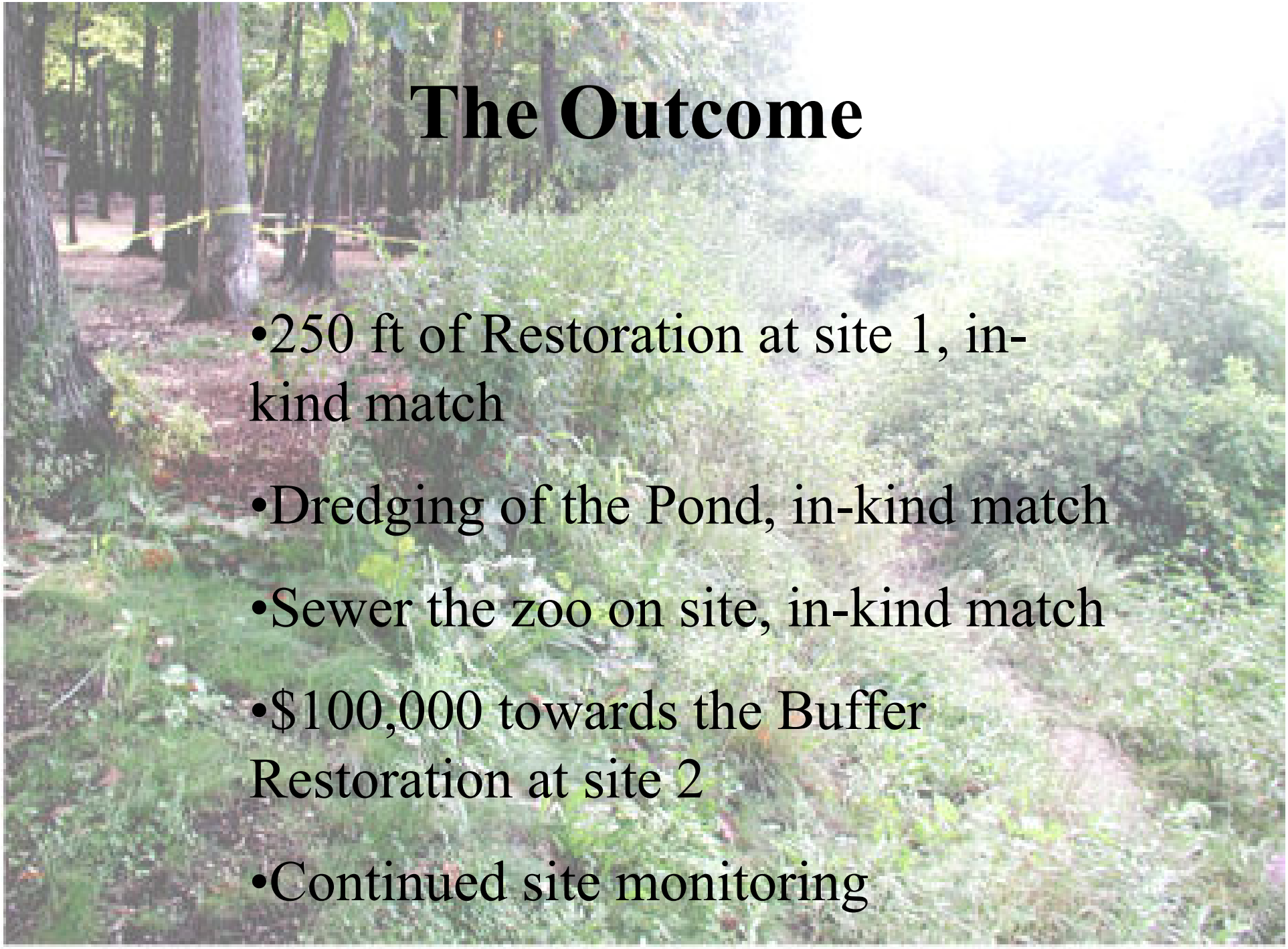
- Watershed Area Managers
- Water Assessment Team
- Non Point Source Program
- 319 Grant Program
- TMDL Program
- Other Programs or Divisions within the DEP which need supplemental data



Van Saun Brook Case Study

- 2000, the Bergen County Environmental Council trained by NJDEP in SOS protocol
- 2001, Environmental Council notified the NJDEP volunteer coordinator of a potential restoration project
- 2002, NJDEP, 319 (H) program, awarded $100,000 to the BCEC for the restoration project


VM Station #1
VM Station #2
NJDEP Monitoring Station



The Outcome

- 250 ft of Restoration at site 1, in-kind match
- Dredging of the Pond, in-kind match
- Sewer the zoo on site, in-kind match
- $100,000 towards the Buffer Restoration at site 2
- Continued site monitoring

Go see what's out there.