Stream Monitoring Program Kickoff

Loudoun Wildlife Conservancy

March 7, 2015

Introductions

- Your Name
- Your Watershed Address
- Your most interesting experience while near a stream

Today's Agenda

- What is a healthy stream?
- Why are Macroinvertebrates good indicators of stream health?
- Introduction to Macroinvertebrate Identification
- How can you participate?
- Four Activities
  - Dry Netting
  - Counting and Scoring
  - Habitat Assessment
  - Mapping stream conditions by watershed

Why is this a healthy stream?

Healthy?

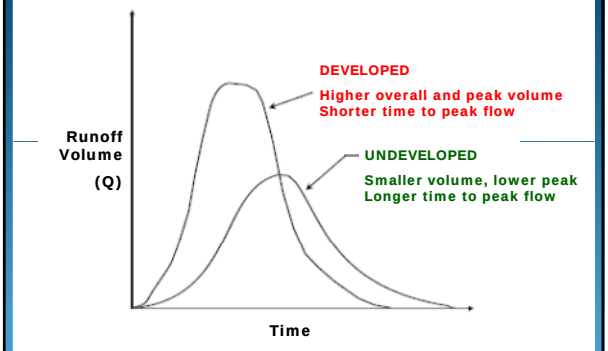
Could this be a problem?

Measuring Human Impacts

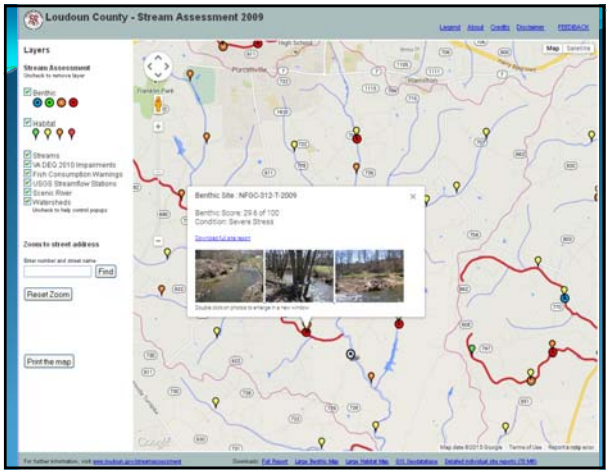
Changes in land use affect watershed resources:

- Changes in hydrology
- Changes in water quality
- Changes in stream morphology
- Changes in stream ecology

Hydrologic Response: Developed vs. Undeveloped Conditions



Too much water?



Changes to Water Quality

- Temperature
- pH (acidity)
- Dissolved Oxygen
- BOD (biological oxygen demand)
- Nutrients (nitrogen, phosphorus)
- Turbidity (cloudiness)
- Pathogens (bacteria, virus)
- Heavy metals
- Petroleum based compounds

Measuring Human Impacts

Biological indicator: groups or types of biological resources that can be used to assess environmental condition.

Biological monitoring: the study of organisms and their responses to environmental condition

Biological assessment: an evaluation of the biological condition of a water body using biological monitoring data and other direct measurements of resident biota in surface waters

Biological Integrity

"the ability to support and maintain a balanced, integrated, and adaptive community of organisms having a species composition, diversity and functional organization comparable to those of natural habitats within a region" †

†(Karr,1981)

What is a Benthic Macroinvertebrate?

Benthic = lives on the bottom

Macro = visible without magnification

Invertebrate = no backbone

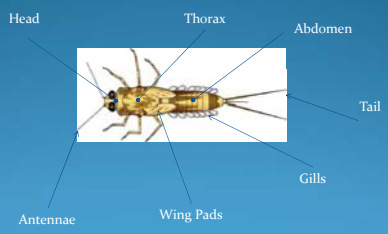
Why are they good indicators?

- Spend up to one year in the stream
- Have little mobility
- Generally abundant
- Primary food source for many fish
- Wide variety of tolerances to pollution

Macroinvertebrates as Indicators

- Limited migration patterns–good indicators of localized conditions and site-specific impacts
- Integrate effects of human impacts
- Easy to sample and identify
- Broad range of habitat requirements and sensitivities to pollution

Body Parts



Macroinvertebrate	Tally	Count	Macroinvertebrate	Tally	Count
Worms			Common Netspinner		
Flat Worms			Most Caddisfly		
Leeches			Beetles		
Crayfish			Midges		
Sowbugs			Blackflies		
Scuds			Most True Fly		
Stoneflies			Gilled Snail		
Mayflies			Lunged Snail		
Dunneflies and Dragonflies			Clams		
Hellgrammites, Fishflies, and Alderflies			Other Subsurface Invertebrates		
			TOTAL NUMBER OF ORGANISMS IN SAMPLE		

Black Flies

Order: Diptera

Size: up to ¼"

Tolerance: Tolerant

Distinguishing Characteristics:

- The body is larger at the rear end similar to the shape of a bowling pin
- The distinct head contains fan-like mouth brushes
- Often curl into a "u" shape when held in your hand

Midge Flies

Order: Diptera

Size: up to ¼"

Tolerance: Tolerant, they can indicate poor stream health caused by pollution if found in large numbers

Distinguishing Characteristics:

- Often whitish to clear, but occasionally bright red
- Segmented body
- Has distinct head with two small prolegs in the front of the body
- Display a spastic squirming action in the water

Most Caddisflies

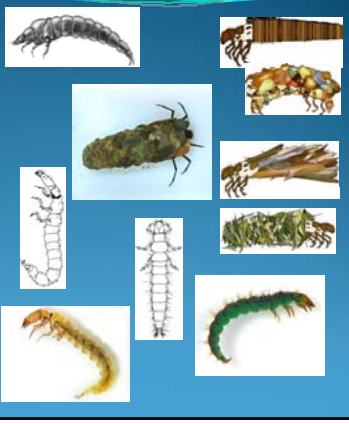
Order: Trichoptera

Size: ½" to 1 ½"

Tolerance: Sensitive

Distinguishing Characteristics:

- Larva is caterpillar-like with
- three pairs of legs and tends to curl up slightly
- Two claws at posterior (rear) end
- May be found in a stick, rock, or leaf case with its head sticking out



Stoneflies

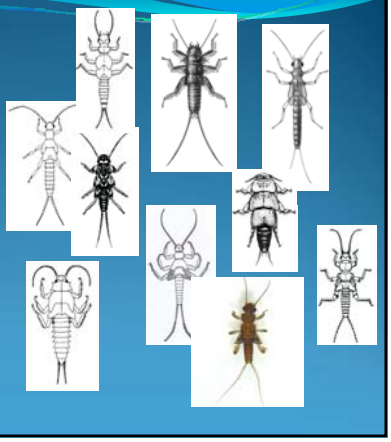
Order: Plecoptera

Size: ½" to 1½"

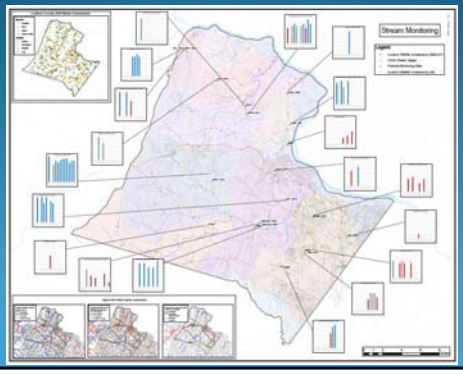
Tolerance: Sensitive

Distinguishing Characteristics:

- Two hair-like tails
- No gills on rear half of body
- Structurally similar to mayfly nymphs, but have two tails instead of the usual three in mayflies
- 2 claws on each foot



Where do we sample?



How can I participate?

Help and practice in the field with an existing team

- Sign-up sheets
- Check our calendar:
  http://www.tinyurl.com/loudounstreammonitor

Become a certified stream monitor

Sample periods:

March/April/May
Jun/Jul/Aug
Sep/Oct/Nov

Participation Roles

Coordinator Mostly work with LWC Board and attend monthly meetings.
Scheduler – keep up the calendar and "nudge" certified leaders to schedule monitoring events, festival and event management
Data Manager – Accept field sheets, compile data to excel, post on web site and submit to VA SOS (I'll probably take this one)
Equipment Manager – Maintain inventory of equipment, verify assignment of equipment, replenish and establish budget for future kits
Communications – Maintain list of interested parties, prepare email communications, update the brochure as necessary

Upcoming Monitoring Events

Milltown Creek – David Ward – Sun, May 18, 2pm
Crooked Run – Phil Daley – Wed, April 22, 4 pm
Goose Creek –
North Fork Beaverdam Creek -
Limestone Branch -

Activity

- Dry-monitoring – Netting and counting
- Scoring the insect count
- Habitat Assessment
- Monitoring data by watershed

Dry Stream Excercises

Like us on Facebook

Loudoun Wildlife Conservancy
Loudoun Watershed Watch