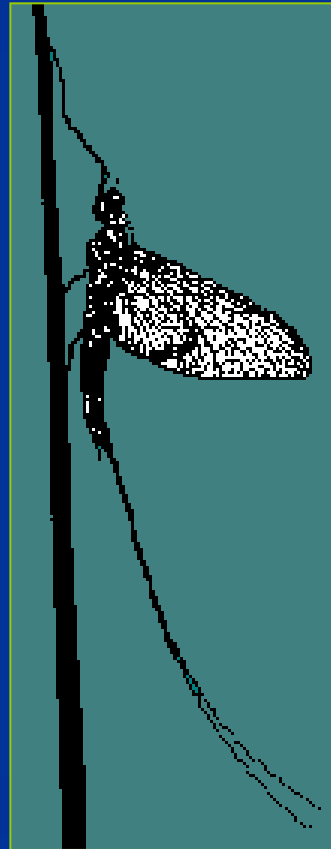


Pennsylvania Stream Assessments



Assessment Protocol

- Systematic watershed surveys
 - Identify land use
 - Select representative sites
- Rapid Bioassessment Protocol
 - Biological evaluation
 - Habitat assessment

Biological Assessment

- Based on macroinvertebrate collections
- Diversity and abundance influenced by water and habitat quality
- Biological metrics used to determine impairment

Biological Condition

- Healthy community:
 - High diversity
 - Good representation by pollution intolerant taxa
- Impaired community:
 - Low diversity
 - Few or no pollution sensitive taxa

Habitat evaluation

- 12 habitat variables are scored
- Categories range from Optimal to Poor
- Total score reflects overall quality
- Metrics used to determine impairment threshold

Good habitat

- Diverse substrate and cover
- Depth and current velocity variation
- Minimal bank erosion
- Low sedimentation rate
- Well-developed riparian buffer

Poor Habitat

- Heavy sediment deposits
- Excessive bank erosion
- Poor riffle development
- Fragmented riparian zone

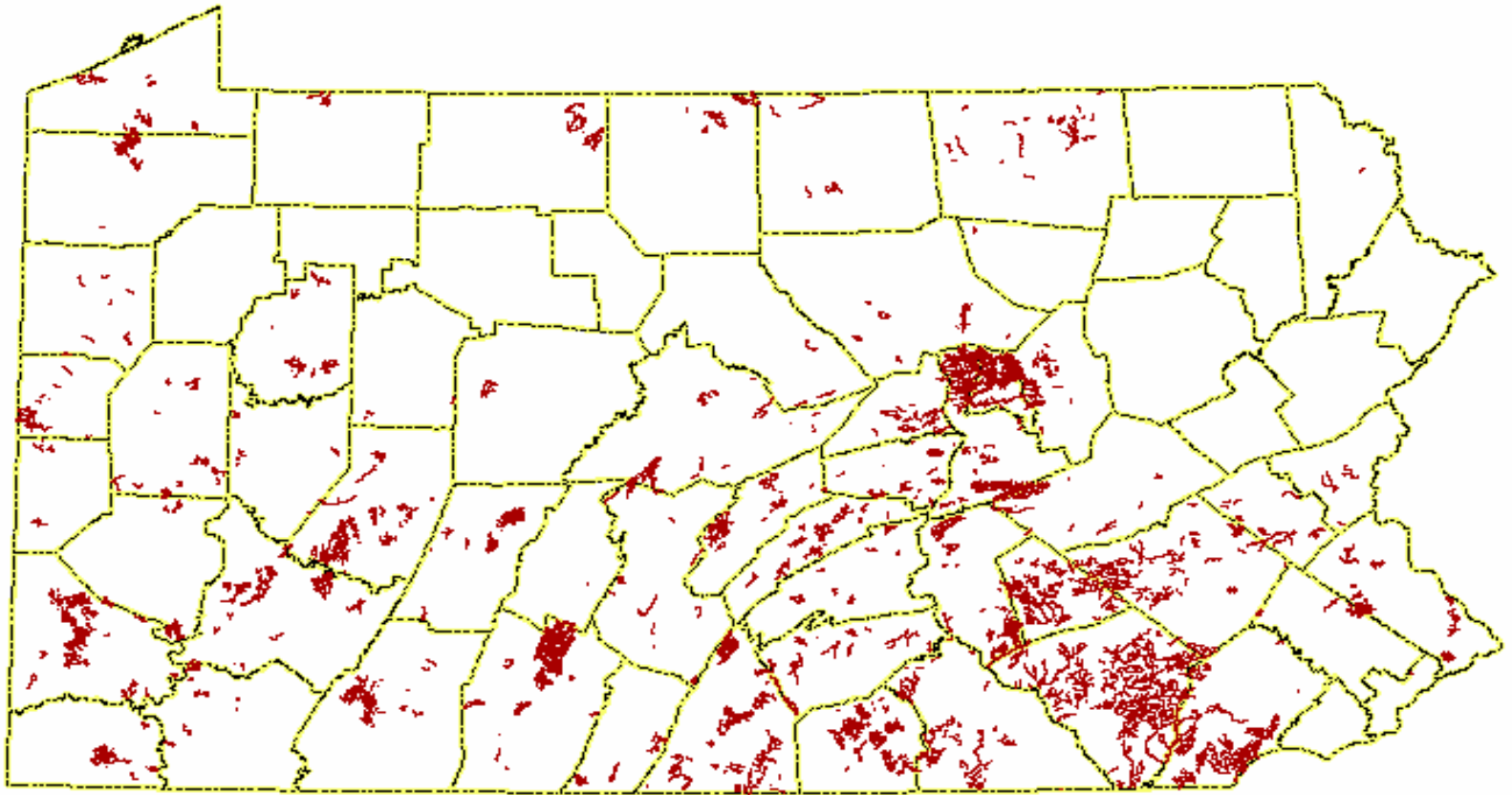
Stream condition

- Biological and habitat metric scores indicate a diverse community with stable habitat
 - Stream is not impaired
- Biological or habitat metrics indicate a stressed or degraded condition
 - Stream is impaired

Identifying Sources and Causes of Impairment

- Identify point source discharges
- Sample locations are representative of land use in the assessment unit
- Biological response and habitat condition are indicative of environmental stressors
- Source/Cause ID based on metric scores and interpretation of observations

Agriculture Impairments as of April 2008



Chillisquaque Creek Watershed

- Agriculture is the dominant land use type
- Stream habitat conditions are marginal
- Moderate to severe bank erosion and sedimentation are prevalent
- Macroinvertebrate diversity is low to moderate
- Sensitive macroinvertebrate taxa are poorly represented

West Branch Chillisquaque Land use and Stream Condition

Stream	Station	IBI Score	% Developed	% Forest	% Agriculture
West Br. Chillisquaque Creek	20080109-1235-jryder	63	0.2	82	17
West Br. Chillisquaque Creek	20080109-0900-jryder	74	0.1	67	32
West Br. Chillisquaque Creek	20080109-1005-jryder	52	0.2	60	39
West Br. Chillisquaque Creek	20080109-1108-jryder	45	0.8	51	48

IBI < 63 = biological impairment

East Branch Chillisquaque Land use and Stream Condition

Stream	Station	IBI Score	% Developed	% Forest	% Agriculture
East Br. Chillisquaque	20080303-1445-SRB	71	0	90	10
East Br. Chillisquaque	20080402-1000-SRB	56	0.01	62	37
East Br. Chillisquaque	20080303-1315-SRB	44	0.05	54	45
East Br. Chillisquaque	20080303-1210-SRB	42	0.1	42	57

IBI < 63 = biological impairment

Stream Condition and Land Use

Stream	Station	IBI Score	% Developed	% Forest	% Agriculture
County Line Branch	20080110-0955-jryder	32	0.1	26	73
County Line Branch	20080110-1047-jryder	44	0.1	59	40
White Hall Creek	20080303-1250-SRB	47	0.1	30	69
Mud Creek	20080303-1100-SRB	42	0.1	28	71
Mud Creek	20080402-0900-SRB	30	0.3	24	75

IBI < 63 = biological impairment