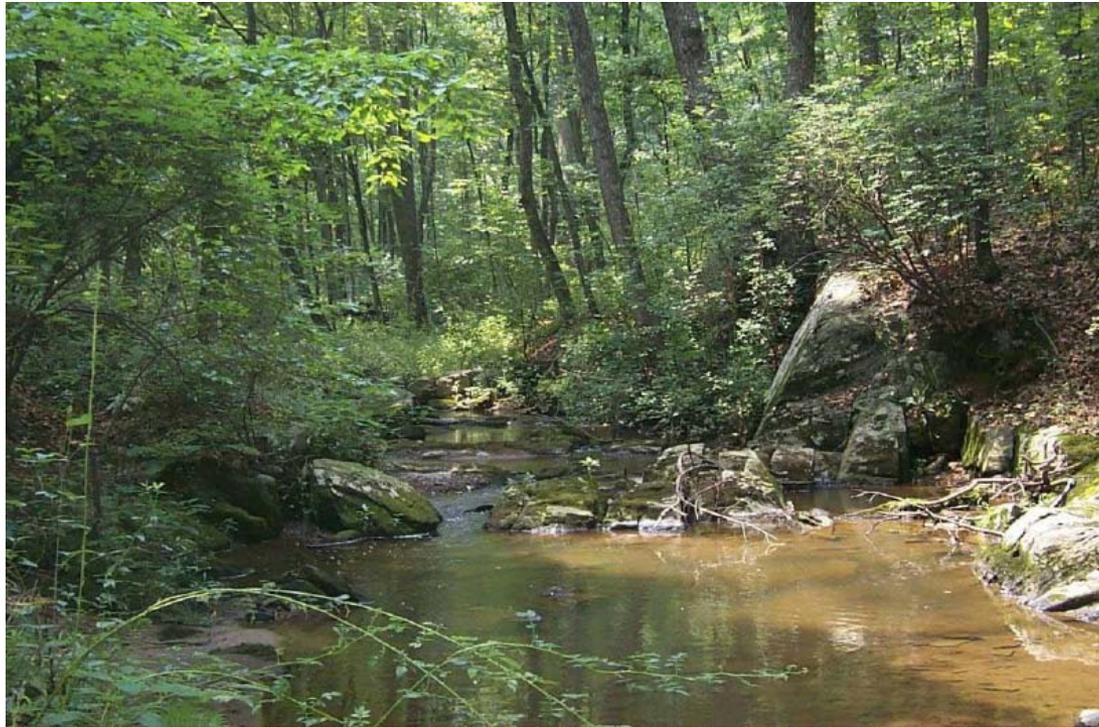


Preliminary Biological Condition Gradient (BCG) for Montgomery County Maryland



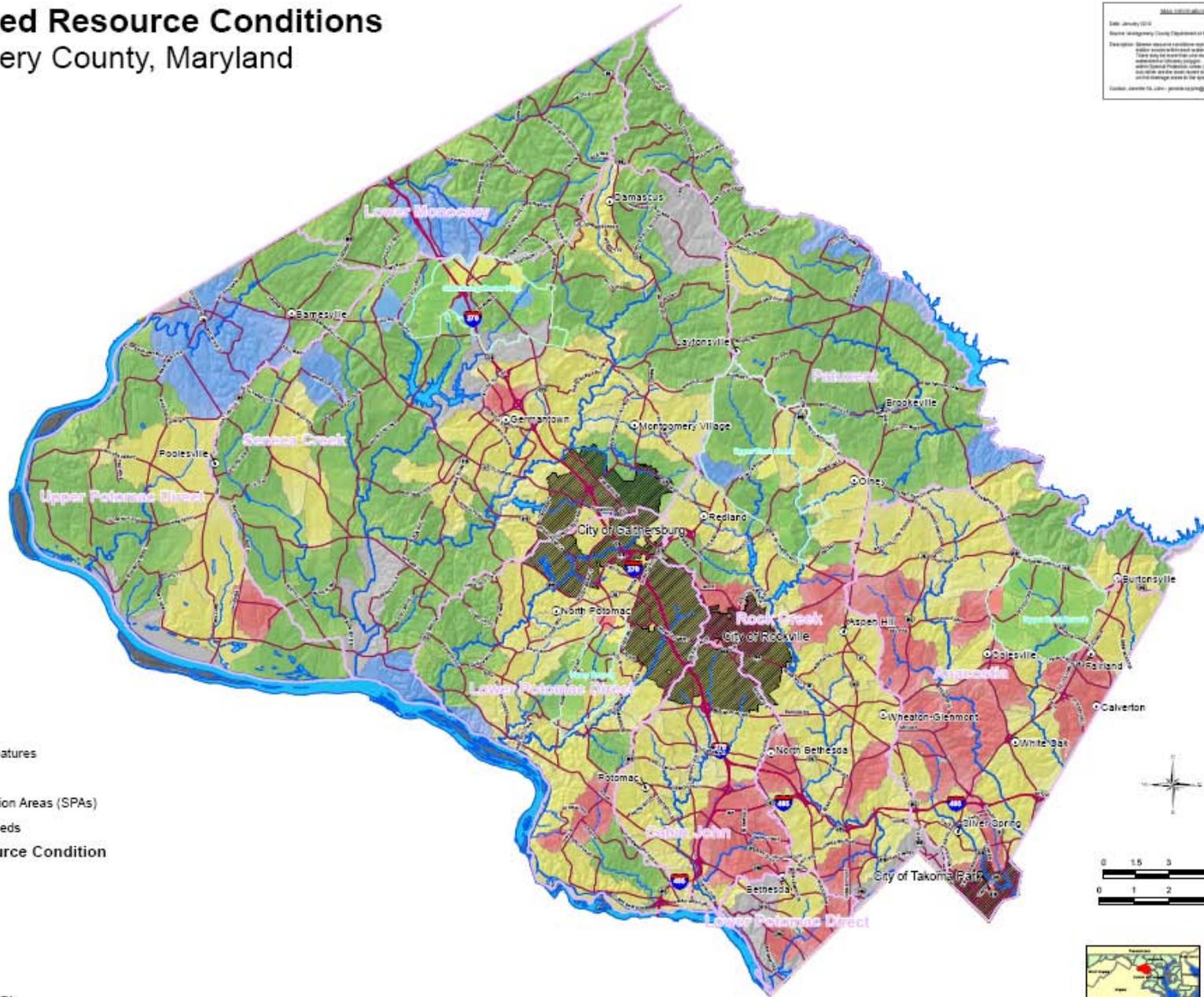
Water Quality Advisory Group

8/12/13

Watershed Resource Conditions

Montgomery County, Maryland

Map Information
 Date: January 2014
 Source: Montgomery County Department of Environmental Protection
 Description: Stream resource conditions represent the average of multiple water quality indicators in a stream segment. There are five water quality indicators used to assess stream health: dissolved oxygen, stream temperature, stream turbidity, stream bank stability, and stream bank erosion. Stream resource conditions are categorized into five levels: Excellent, Good, Fair, Poor, and Not Monitored. Stream resource conditions are also categorized into five levels: Excellent, Good, Fair, Poor, and Not Monitored. Stream resource conditions are also categorized into five levels: Excellent, Good, Fair, Poor, and Not Monitored.



LEGEND

- Places
- City
- Roads
- Interstates
- Major Routes
- Major Water Features
- Municipalities
- Special Protection Areas (SPAs)
- 8 Digit Watersheds

Watershed Resource Condition

- Excellent
- Good
- Fair
- Poor
- Not Monitored
- County Boundary



Needed a Method that:

- measures degree of fragility/sensitivity
- measures risk of further degradation as well as improvement
- indicates when sites are increasingly at risk but IBI says is still 'good'

What is the Biological Condition Gradient (BCG)?

A scientific framework for determining biological response to anthropogenic stress

Longstanding, accepted science

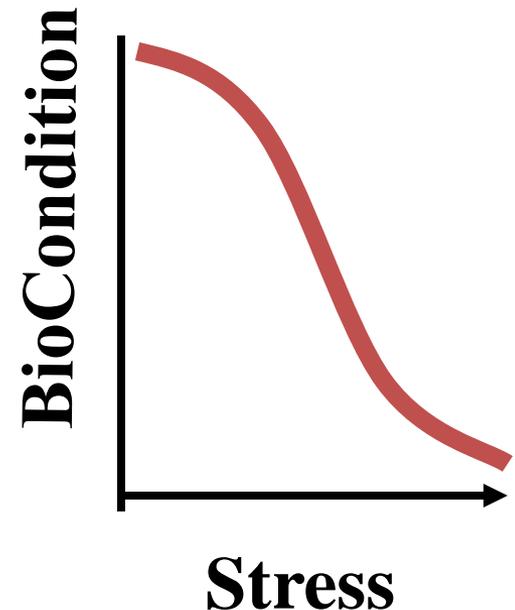
Measurable and predictable

Based on biological data

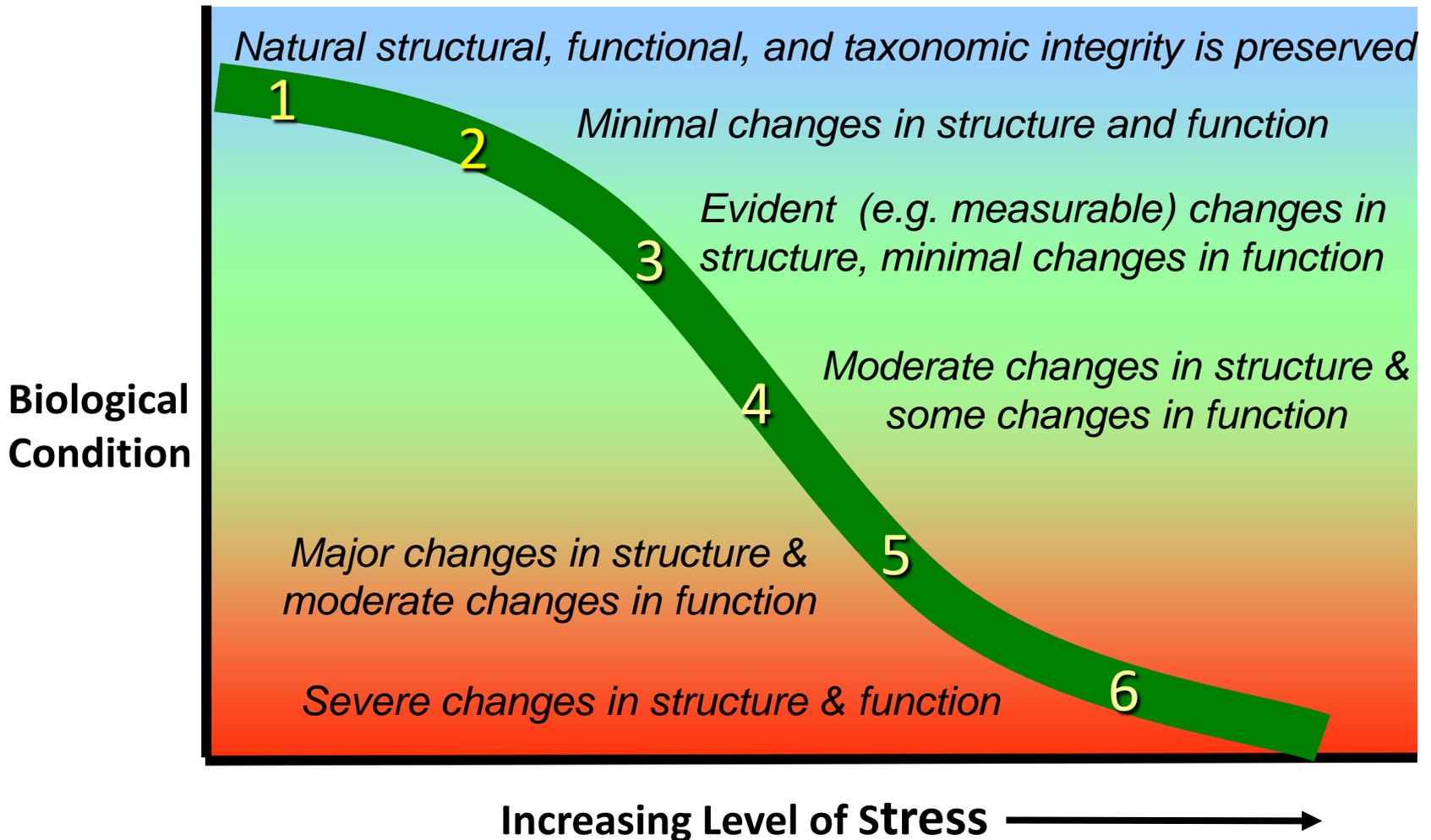
Allows for regionwide assessments and comparisons on a level playing field

Must be calibrated by region, stream class

Provides an effective means to communicate biological conditions to resource managers and the public



BIOLOGICAL CONDITION GRADIENT



Undisturbed/Minimally Disturbed Stream



Stoneflies



Dragonflies,
Damselflies



Mayflies



Beetles



Midges



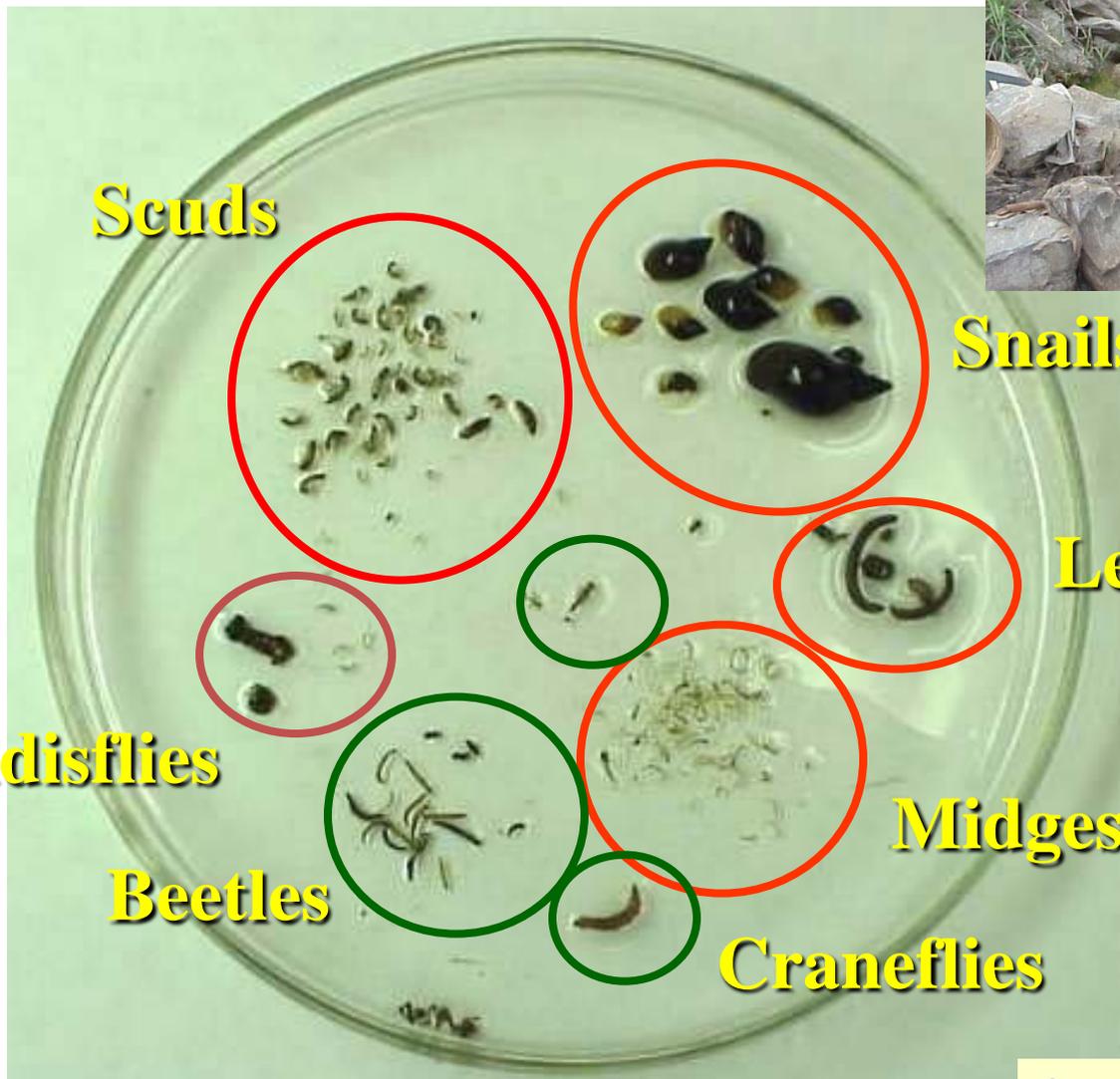
Caddisflies



1 inch

Courtesy of Susan Davies, ME DEP

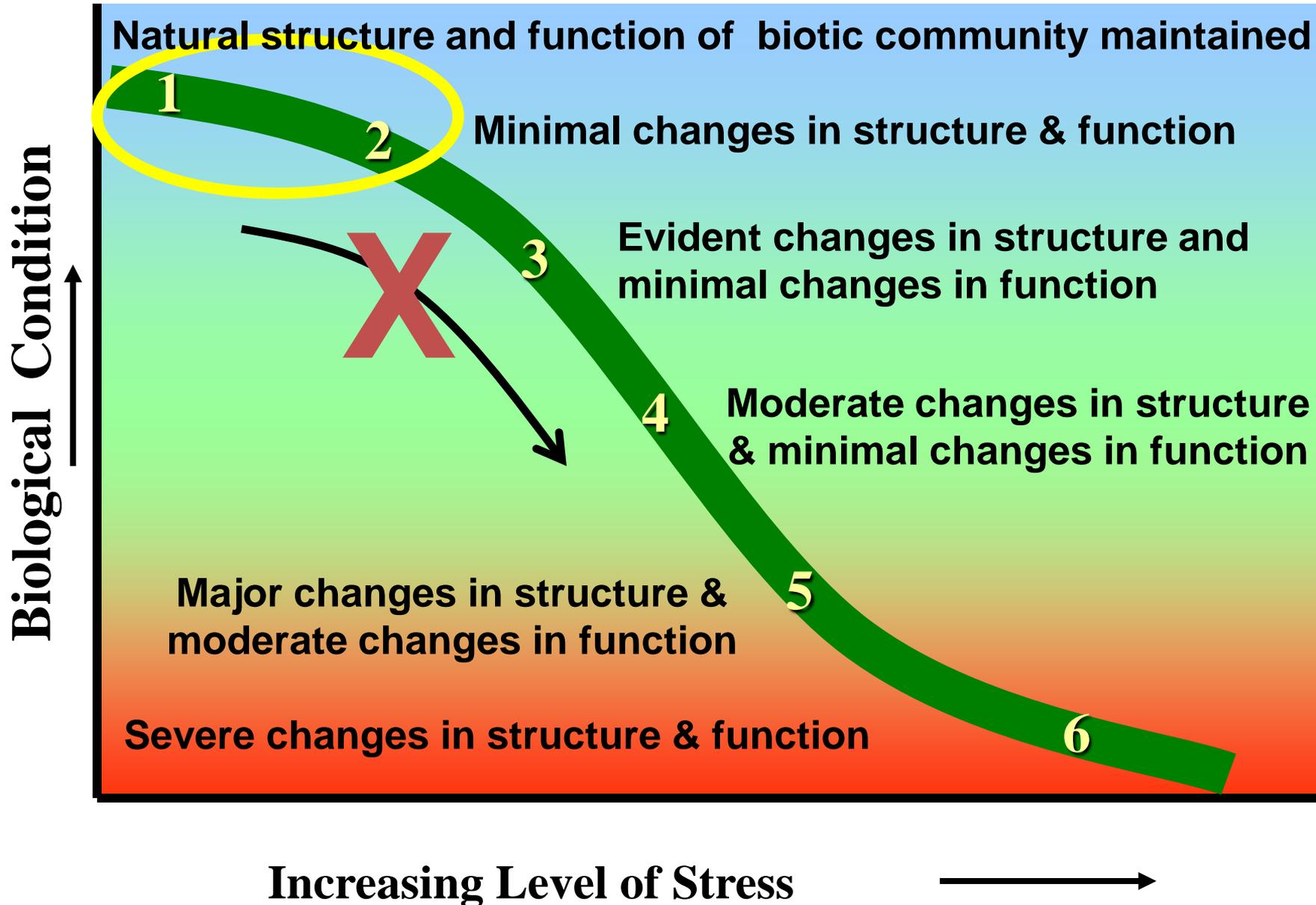
Drainage from a Shopping Mall Parking Lot



1 inch



Biological Condition Gradient-Protect HQ Waters



Example: PA Freestone Streams

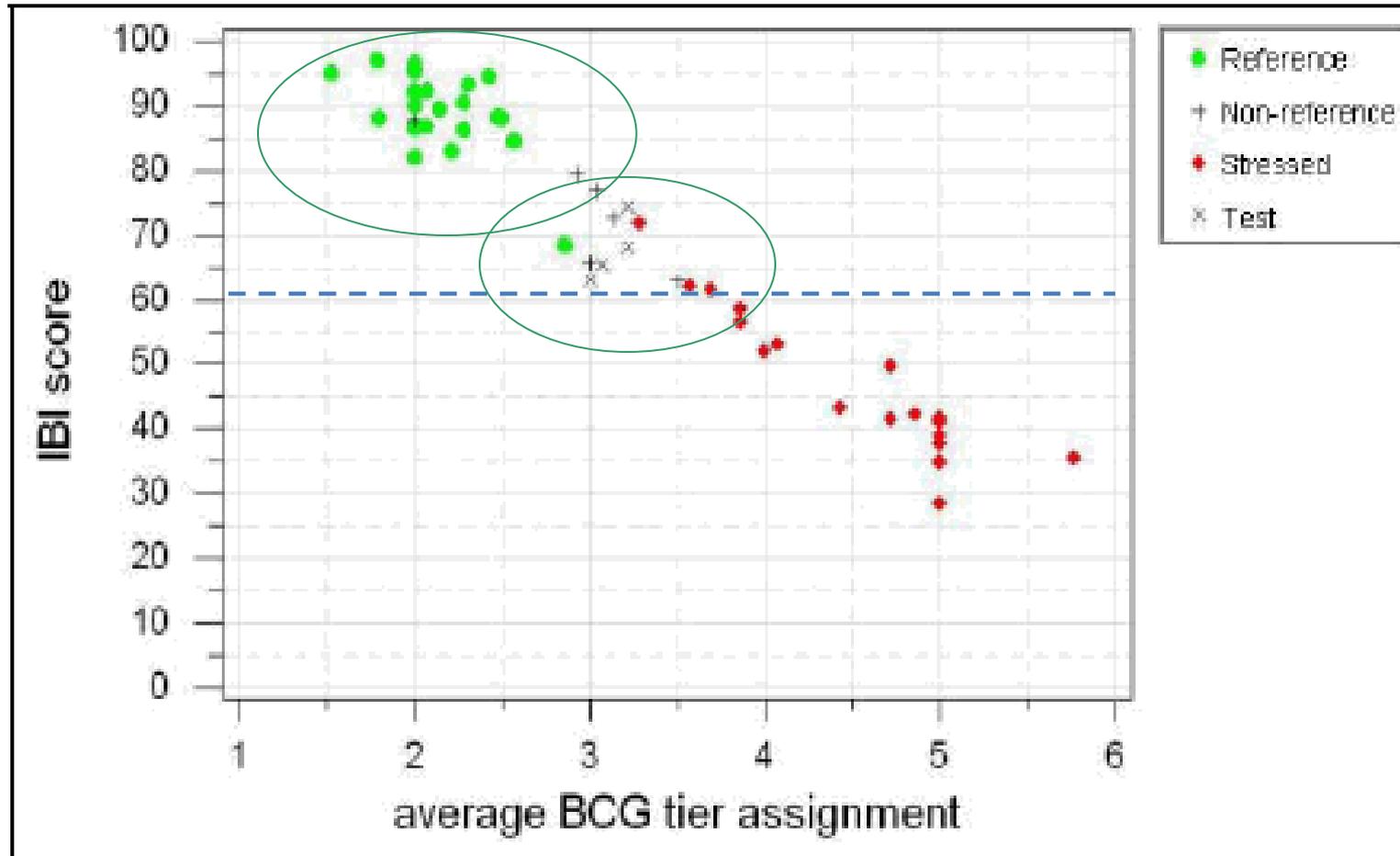
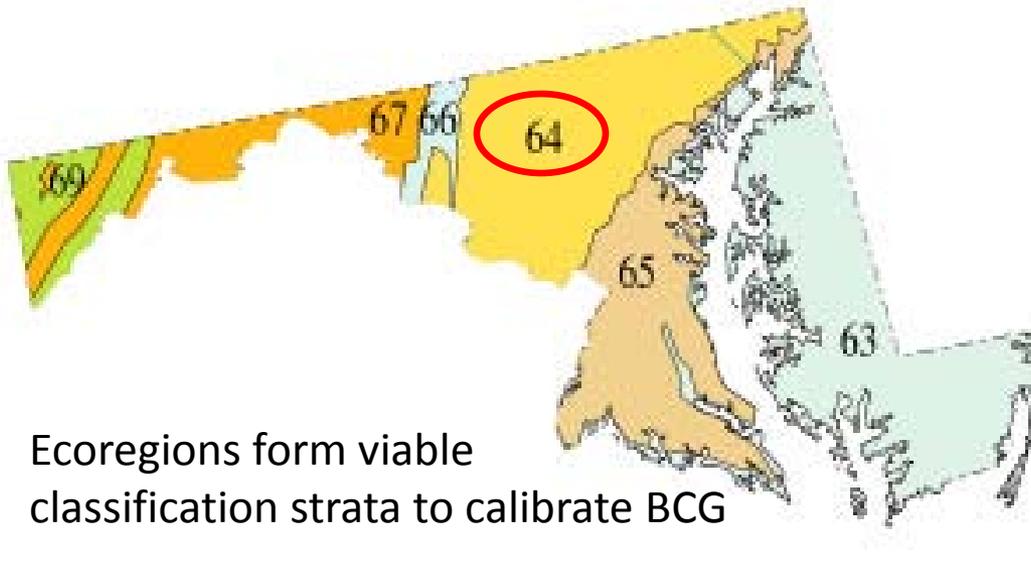
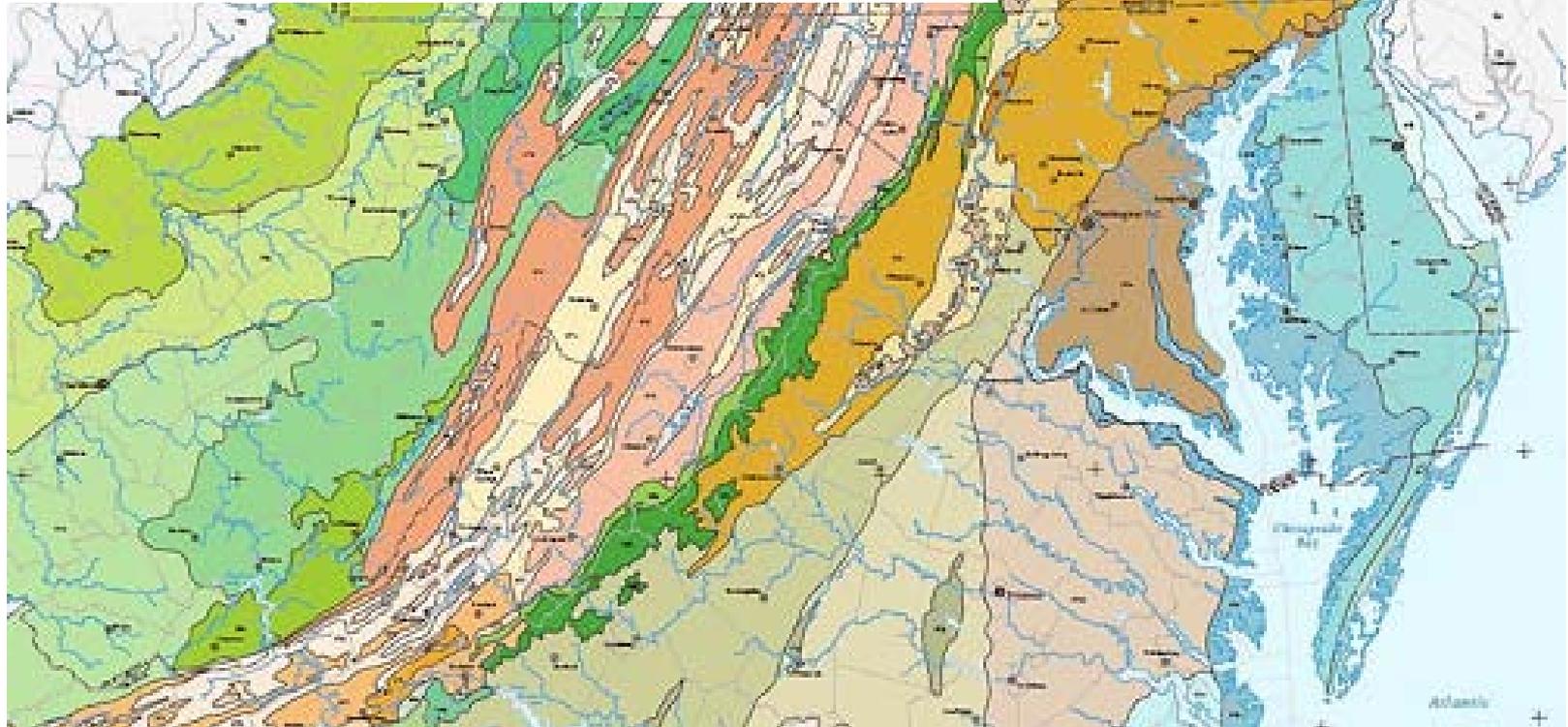
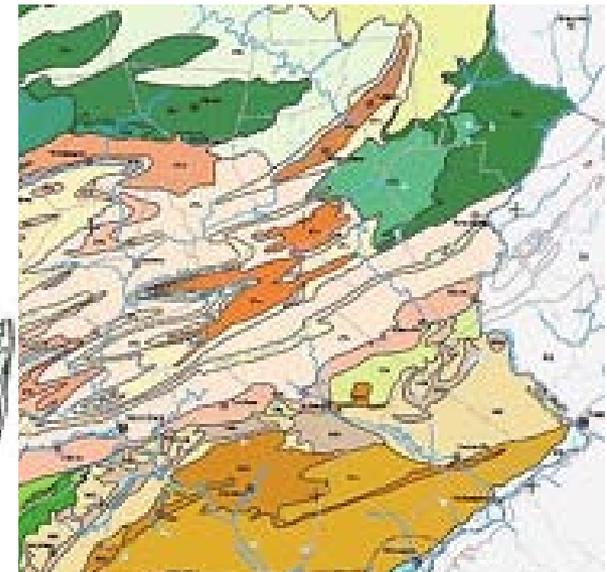


Figure 17. IBI scores for 53 samples plotted against the average assigned TALU workshop tier and coded according to sample type.



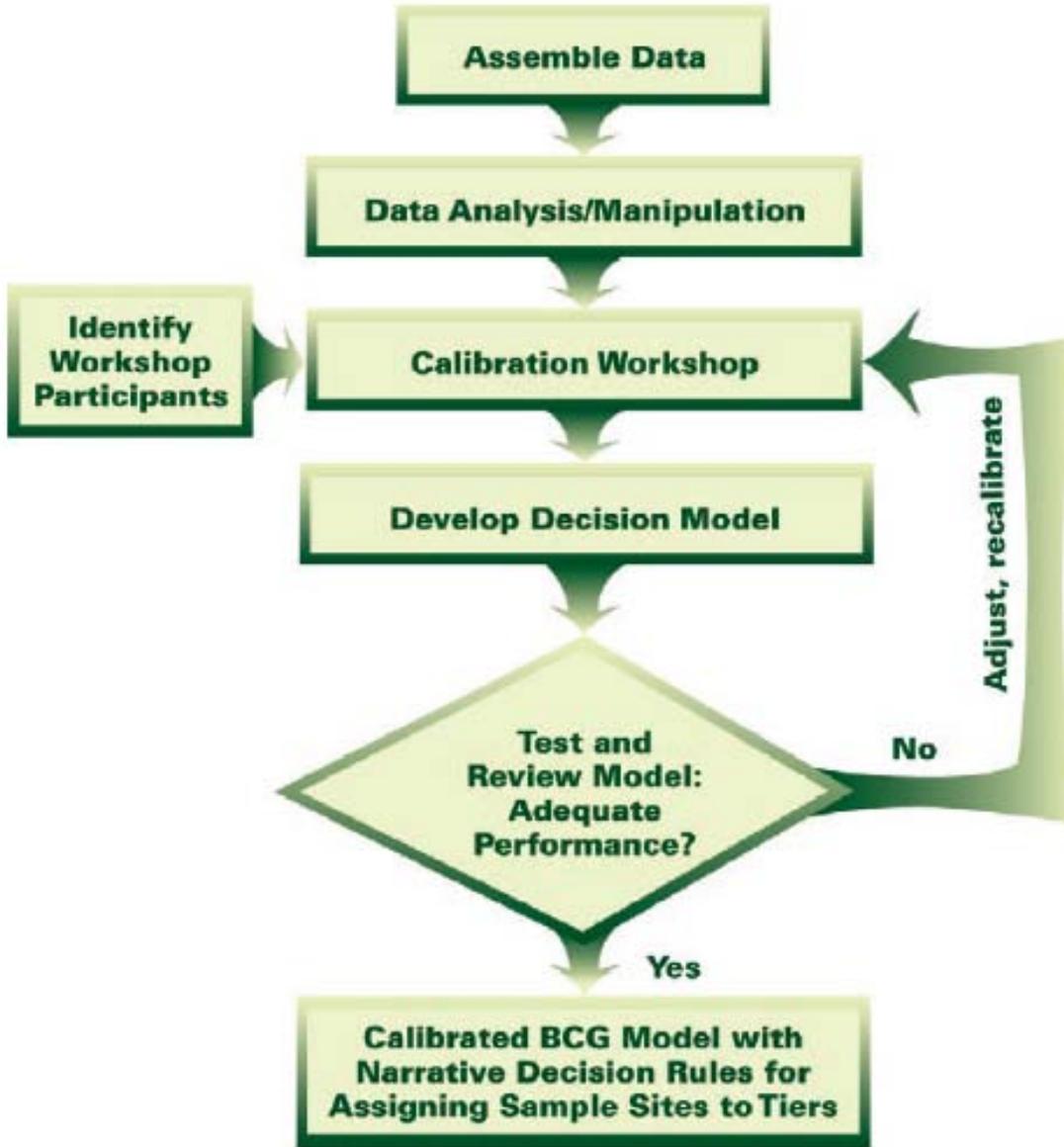
Ecoregions form viable classification strata to calibrate BCG



Stream size or reach gradient-type stratification should also be considered in BCG development



BCG Calibration

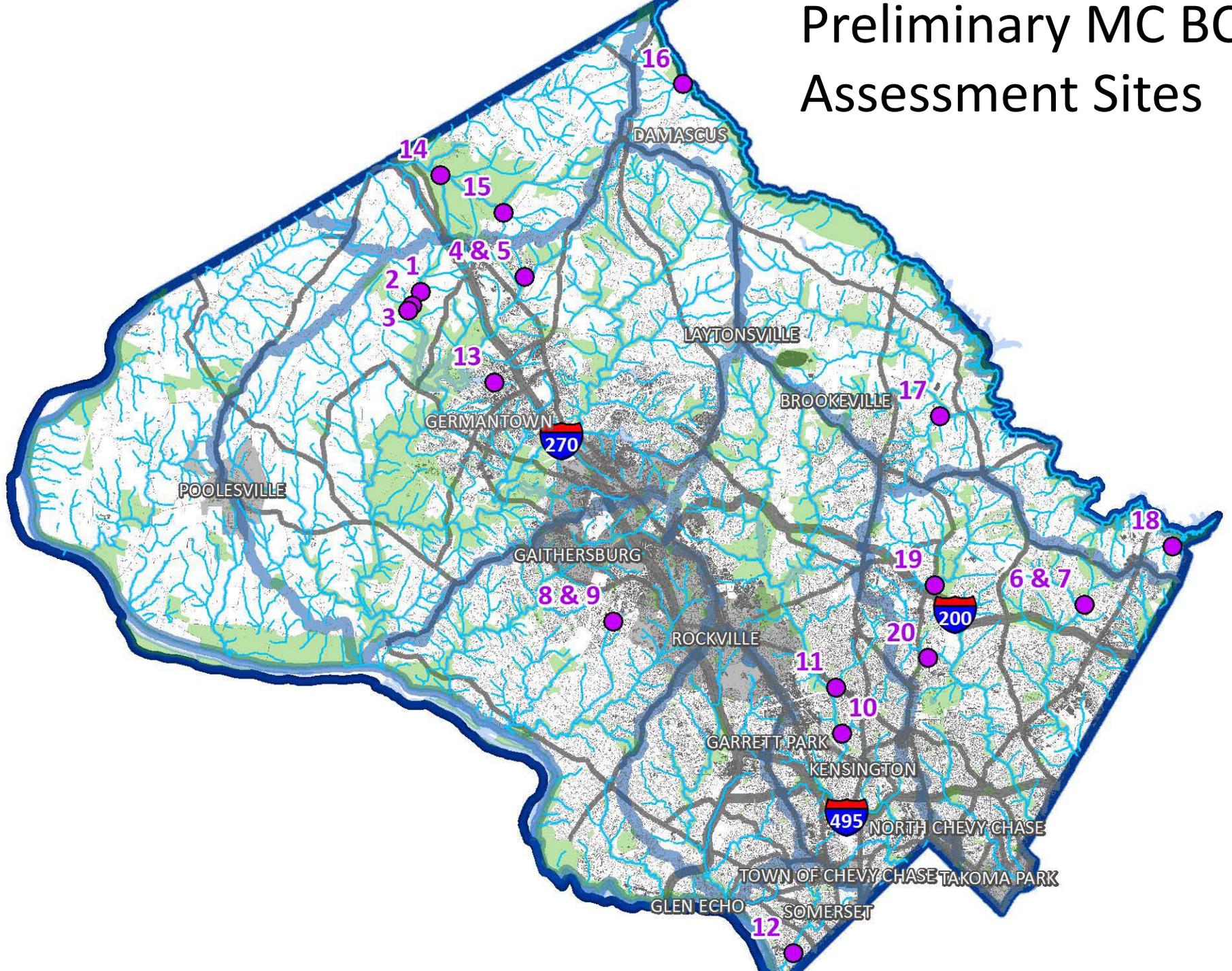


Review taxa and assign attributes

Review taxa lists and classify sites
Into BCG tiers

Determine rules that relate taxa
occurrence and abundance, taxa
attributes, and BCG tiers

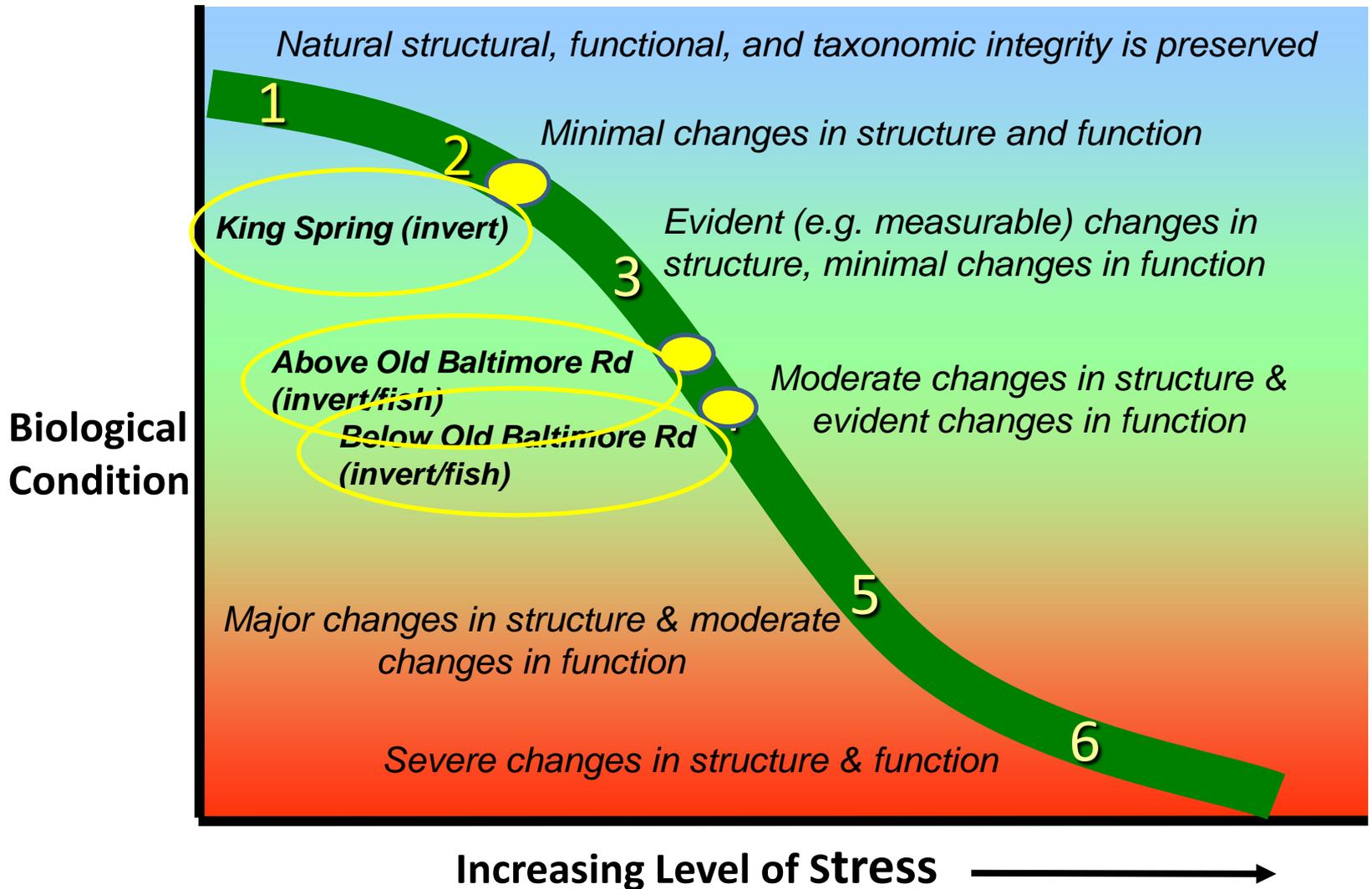
Preliminary MC BCG Assessment Sites



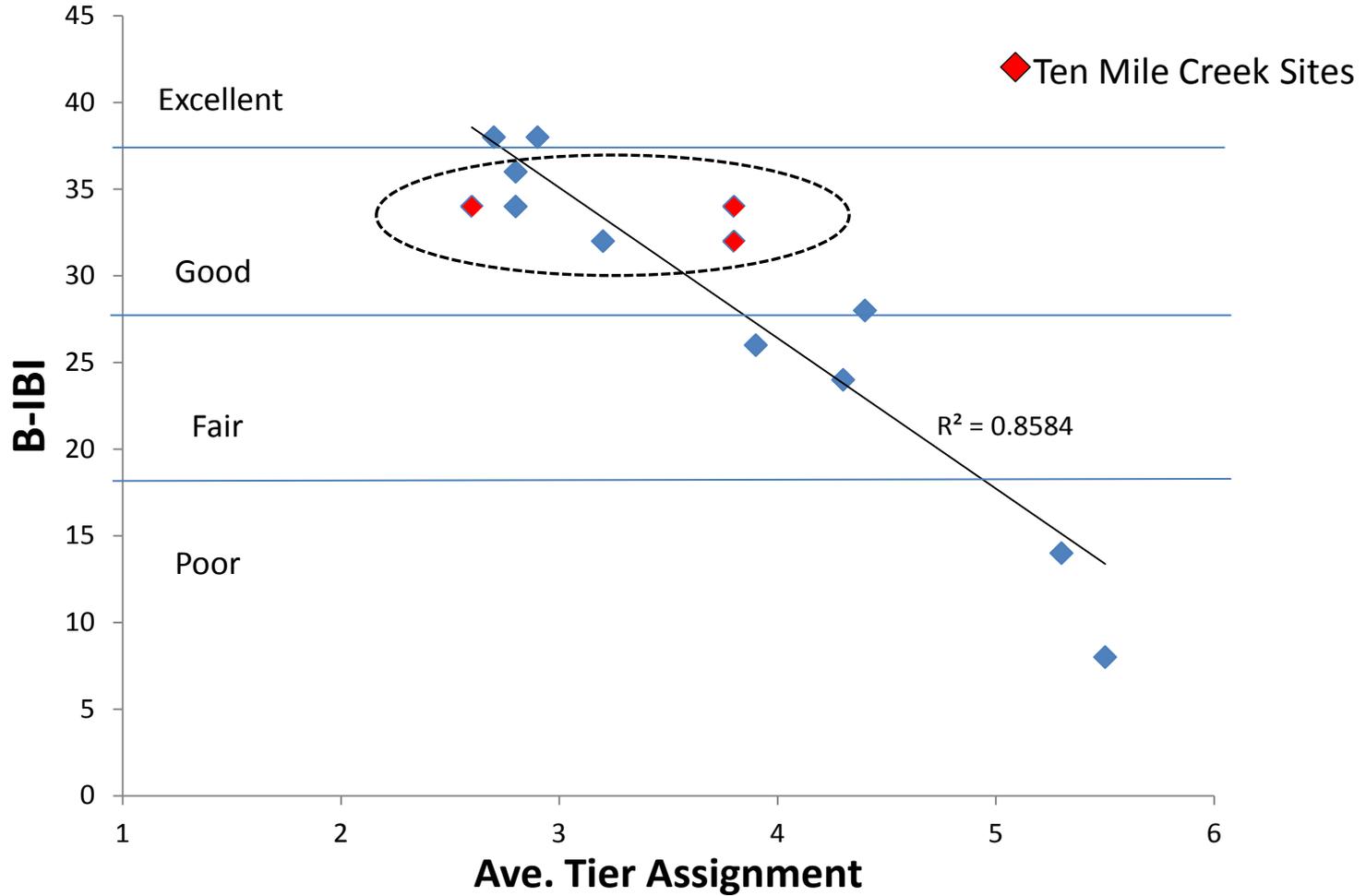
Location of Ten Mile Creek Samples Assessed



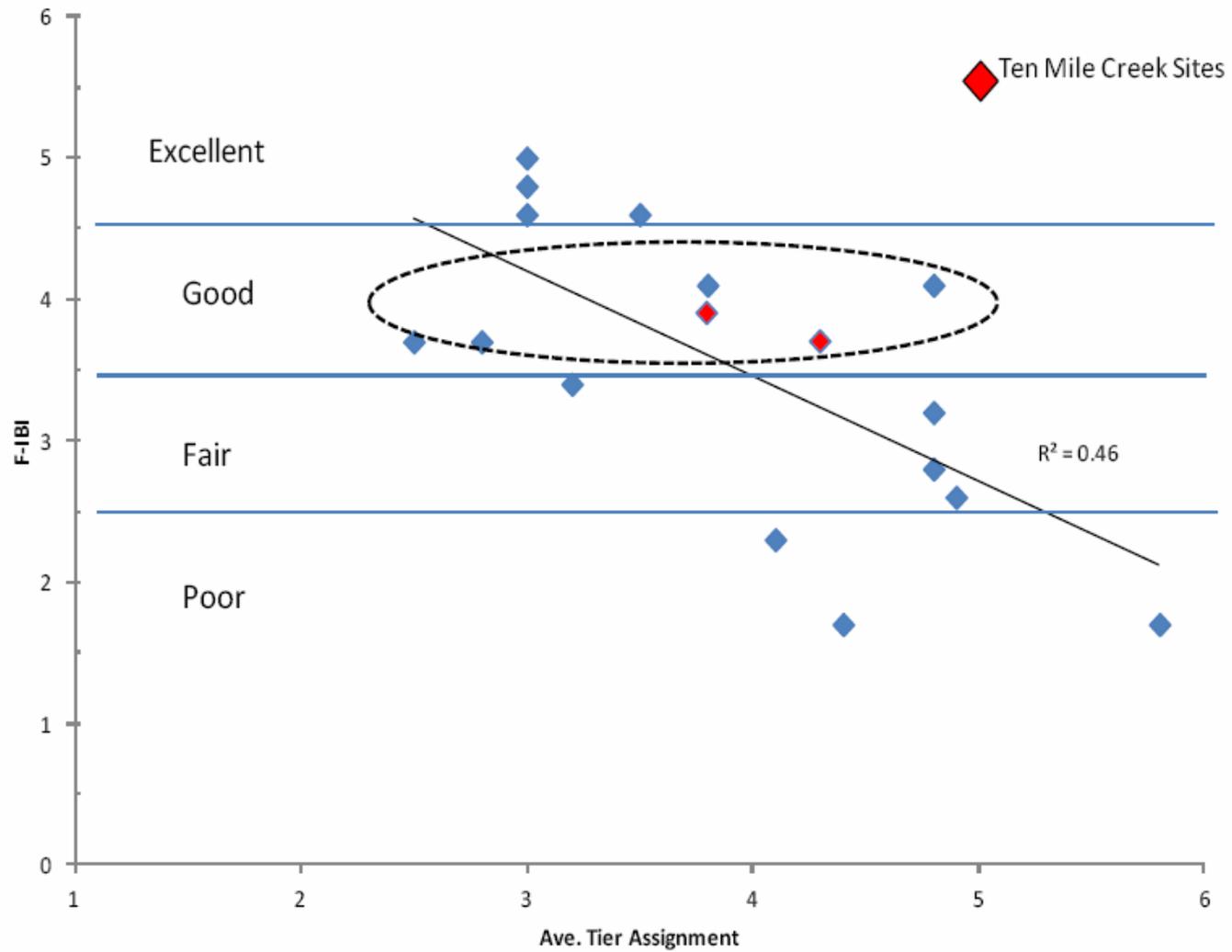
BIOLOGICAL CONDITION GRADIENT



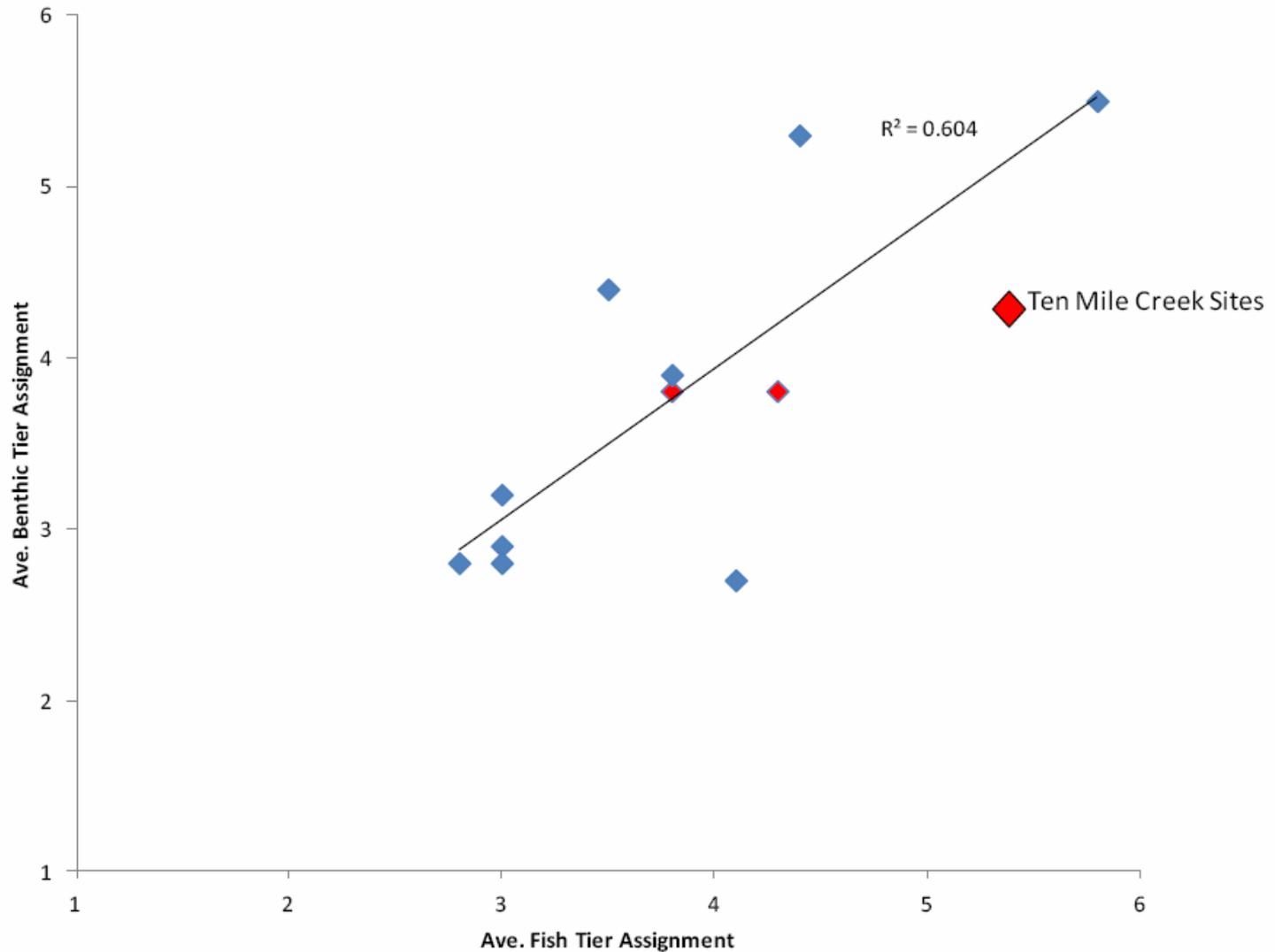
Macroinvertebrates



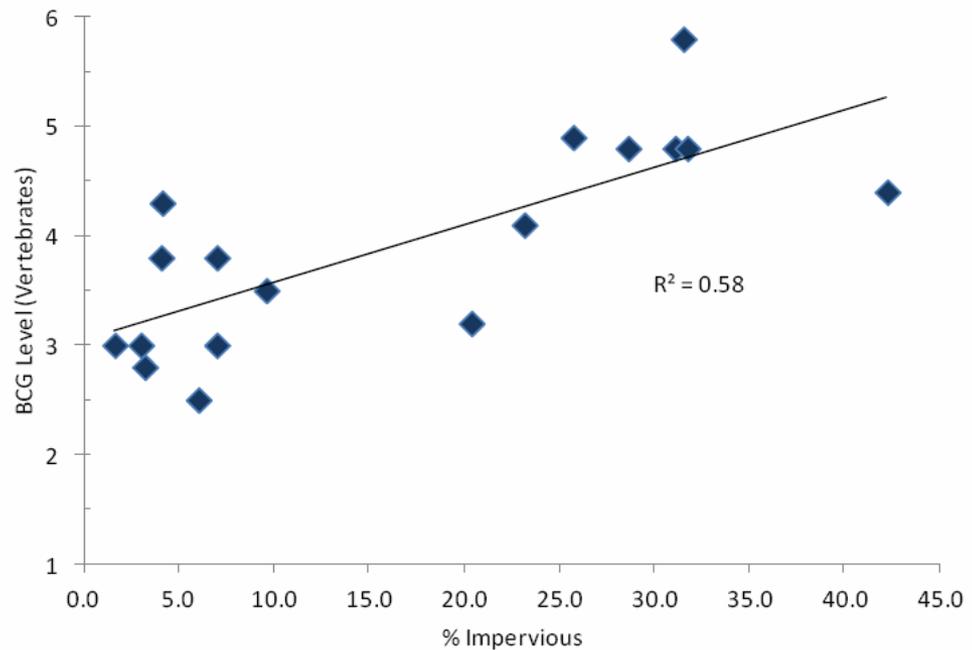
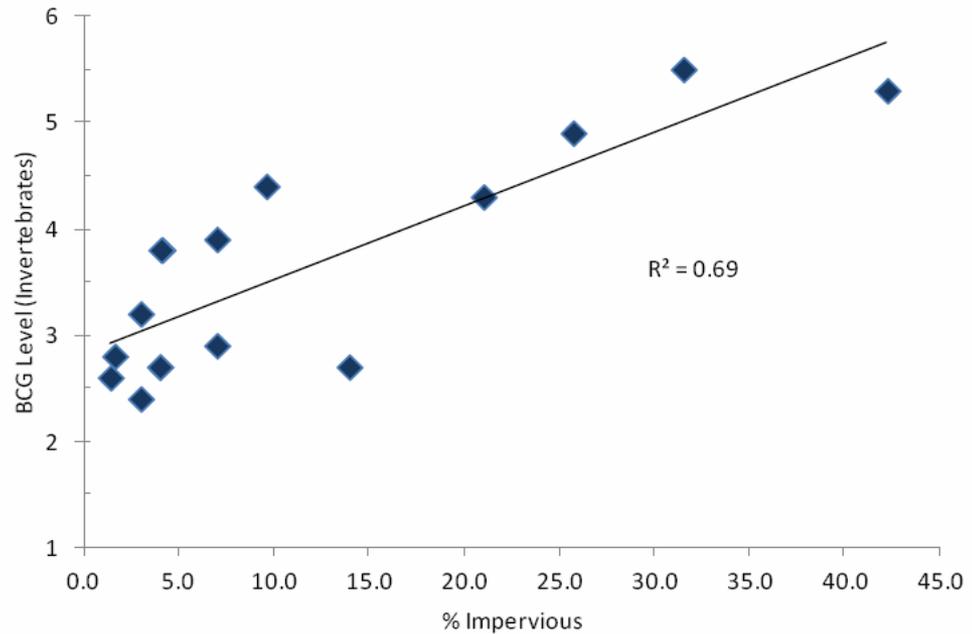
Fish



BCG Tier Assignments of Macroinvertebrates vs. Fish/Salamander Assemblages



Relationship
between BCG Tier
Assignments and %
Impervious Land
Cover for
Macroinvertebrates
(top) and
Fish/Salamanders
(bottom)



Biological Condition Gradient (BCG)

- The BCG can be used to:
 - identify high quality waters that may be threatened and require additional protection and
 - Identify waters that show early signs of degradation but where protection or restoration efforts could be most efficient and successful.