A Recovery Potential Screening Method for Impaired Waters Priority Setting

Doug Norton¹, Jim Wickham² and Tim Wade²

21st Annual Nonpoint Source Conference Plymouth, MA ~ May 2010

¹: USEPA Office of Water, Washington, DC
²: USEPA Office of Research and Development, RTP NC
“Recovery potential should be a primary consideration in restoration programs whose main aim is to bring about recovery.”

EPA TMDL Program Results Analysis Web Site, May 2009

“We are undertaking a multi-year initiative to target watershed restoration resources to biologically degraded non-tidal streams with high recovery potential. Our objective is to remove waters from Maryland's 303(d) list.”

Jim George, Manager
MDE WQ Protection & Restoration Program
What is Recovery Potential Screening?

A method to help impaired waters restoration planners compare restorability

- Origins in TMDL/303(d) impaired waters program priority setting
- Flexible, indicator-based
- Largely GIS-driven
- Landscape and monitoring metrics

**Recovery potential** is the likelihood of an impaired water to reattain Water Quality Standards or other valued attributes, given its
- ecological capacity,
- exposure to stressors, and
- the social context affecting efforts to improve its condition.
Recovery Potential Screening
Tools for Regions and States: Literature Database

- Tool: open, user-modifiable restoration literature database in MS Access that will be downloadable from our web site

- Over 1600-citation database, papers relevant to restoration success factors

- Original source of candidate recovery potential indicators
Recovery Potential Screening
Tools for Regions and States: Indicator Summaries

• Tool: 60 recovery potential indicator reference sheets w/bullets from literature

• Ecological, Stressor, and Social Metrics

• Developed from literature and practice, demonstrated in pilot studies

• Describe relevance to recovery

• Measurable from widely available data
Recovery Potential Screening

Tools for Regions and States: Demonstration Projects

**Illinois 303(d) list prioritization pilot study**
- 303(d) list ‘prioritized schedule’ support tool
- 104 ecological, stressor and social indicators

**Mid-Atlantic states recovery screening**
- narrowly focused on native trout recovery factors
- rapidly completed by states, EPA Region 3

**Maryland impaired watersheds screening**
- addressed restorability at two scales
- which are the most restorable?
- which would improve larger watershed’s condition?
Monitoring programs under the Clean Water Act have identified tens of thousands of US water bodies that do not meet Water Quality Standards and are in need of restoration. This site provides technical assistance for restoration programs to help them consider where to invest their efforts for greater likelihood of success, based on the traits of their own geographic area’s environment and communities.

Draft Web Site Now Accessible At:

http://hudson.tetratech-ffx.com/RECOVERY_POTENTIAL/home.html
# Recovery Potential Screening in Maryland Watersheds

## Two scales of interest

- **94** MD HUCs, 303(d) listing level screening statewide
  
  Which HUCs are the most restorable?

- **1367** catchments, compared within individual HUCs
  
  Which catchments’ restoration would most likely improve a specific HUC’s condition?
Screening among AND within HUCs in MD:

Several borderline-impaired MD HUCs (left) seem to stand out from bioassessment screening metrics alone as good targets for restoration.

What might further illuminate HUC recovery potential if more comparison metrics are used –
• to compare one HUC to another?
• to compare smaller catchments within each HUC?
### Recovery Potential Screening of 94 MDE Watersheds

#### Selected Indicators

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Ecological Sub-score  Stressor Sub-score  Social Sub-score
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Ecological Sub-score  Stressor Sub-score  Social Sub-score

(Ecological + Social) Stressor
Circle size increases with Social Context summary score value.

Stressor Indicators Summary Score

Eco Indicators Summary Score

Pass

Fail
Focusing on more restorable watersheds

Circle size increases with Social Context summary score value

PIEDMONT
- Pass
- Fail
- Higher RP

Stressor Indicators Summary Score
Eco Indicators Summary Score

Circle size increases with Social Context summary score value
Where do high-interest watersheds fall out on the plots?

**S. BRANCH PATAPSCO**
- SumRanks (of 18 fails)
  - ECOSUM: 3
  - STRESSUM: 4
  - SOCIOSUM: 14
  - SUMFORMULA: 5

**CASSELMAN RIVER**
- SumRanks (of 24 fails)
  - ECOSUM: 8
  - STRESSUM: 5
  - SOCIOSUM: 1
  - SUMFORMULA: 3

**MATTAWOMAN RIVER**
- SumRanks (of 29 fails)
  - ECOSUM: 1
  - STRESSUM: 1
  - SOCIOSUM: 4
  - SUMFORMULA: 1
Screening subwatersheds in a priority watershed

Upper Monocacy River MBSS Screening, BIBI color scheme

Circle size increases with Social Context summary score value
Take-home messages about screening

• Priority setting for restoration is inevitable, affects track record and funding

• Priority decisions need systematic, transparent, science-based and user-selected tools

• Consistent comparisons can reveal surprising patterns, e.g., ecologically “worst” sites frequently also have a bad social context score

• We should work together to build up the scientific basis and tools for better prediction of restorability…
A Method for Comparative Analysis of Recovery Potential in Impaired Waters Restoration Planning

Douglas J. Norton · James D. Wickham · Timothy G. Wade · Kelly Kunert · John V. Thomas · Paul Zeph

Thank you for your time!

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