Recovery Potential Metrics
Summary Form

Indicator Name: LARGE WATERSHED MANAGEMENT POTENTIAL

Type: Social Context

Rationale/Relevance to Recovery Potential: State impaired waters programs are increasingly developing watershed plans and TMDLs on the basis of whole watersheds containing multiple impaired waters, rather than individual actions for specific impaired segments alone. EPA also promotes these 'watershed TMDLs' as an effective approach that employs many efficiencies and a 'critical mass' of effort. Frequently, watersheds at the 10- or 12-digit HUC scale contain several different impaired reaches or tributaries that are addressed in a single watershed plan or TMDL document. Moderate to large watersheds at the 8-digit HUC scale or larger have been successfully used to develop TMDLs and implement controls for 100 or more impaired segments. The approach has several procedural advantages for potential recovery. Primarily, there are efficiencies in modeling one larger system rather than constructing numerous models for smaller segments. Community and stakeholder interactions can be time-consuming and again one larger, coordinated effort can provide more consistent messages and thorough outreach to establish community support. Further, the interrelationship of numerous impaired segments in the same watershed through downstream effects, and indirectly through watershed protection decisions that may shift land use pressures to different sub-watersheds, argues for some restoration planning to be done at a broader watershed context.

How Measured: This metric may be used to compare segments or compare watersheds with multiple impaired segments within them. Individual, impaired segments are most easily compared on the basis of their co-location with other impaired waters within a standardized watershed unit (e.g. HUC12, HUC10, HUC8). In this approach, waters with other impaired segments in the same HUC may be ranked higher than those that are isolated. The score can be based on a simple threshold (e.g. 5 or more) or can array the waters continuously based on total count. Beyond this criterion, many options exist for refining the measurement. For example, as particularly dense clusters of impairments probably represent very difficult and complex restorations and potentially severe impairments that may not easily recover, this metric may be used to target less dense clusters that still offer the efficiencies of a watershed-based approach with greater likelihood that valuable ecological features remain and restoration can be achieved. Further, as social metric scoring normally occurs after the ecological and stressor metric screening phase, the option exists to score the large watershed management potential of only the high potential waters or watersheds revealed by the ecological and stressor indicator screening.

Data Sources: The metric requires a source of watershed boundary GIS files and a source of impaired waters GIS files (either 303(d) listed waters or waters with finalized TMDLs, See: See: http://www.epa.gov/waters/data/downloads.html). Several states have additional small to medium-scale watershed boundary datasets as well. The 2002 baseline impaired waters dataset is nationally available, and many states individually have more recent 303(d) cycles available as downloadable GIS files. Waters with finalized TMDLs are available as a national GIS dataset although the continual development of new TMDLs will always keep this a partial dataset.

Indicator Status (check one or more)

_____ Developmental concept.
_____ Plausible relationship to recovery.
_____ Single documentation in literature or practice.
_____ Multiple documentation in literature or practice.
_____ Quantification.

Status/Comments: Operational with currently available datasets, but also worth exploring additional options and alternatives for measurement. Scale generally limits the importance of this factor as the greater complexities and costs in larger and larger scale watersheds eventually may outweigh the efficiencies of watershed-wide restoration efforts at moderate scales, but an optimum scale or range of scales is undefined.

Supporting Literature (abbrev. citations and points made):

- (USEPA, 2008) it is necessary for states to expedite TMDL development to reduce the backlog using an approach that will efficiently address the maximum number of impairments in a scientifically defensible manner. One strategy for doing this is to use a watershed framework for developing TMDLs. Watershed TMDLs can help states to reduce their per-TMDL costs and address more pollutant-waterbody combinations with the given resources while recognizing a number of environmental and programmatic benefits. (see http://www.epa.gov/owow/tmdl/pdf/draft_handbook.pdf)
- (USEPA 1991) Many water pollution concerns are area-wide phenomena that are caused by multiple dischargers, multiple pollutants (with potential synergistic and additive effects), or nonpoint sources. Atmospheric deposition and ground water discharge may also result in significant pollutant loadings to surface waters. As a result, EPA recommends that States develop TMDLs on a geographical basis (e.g., by watershed) in order to efficiently and effectively manage the quality of surface waters.
- (USEPA, 2008) In following years, EPA policy memos reaffirmed their strategy to develop and implement TMDLs on a watershed basis. For example, in 1997, the EPA Assistant Administrator for Water issued a memo as a follow-up to the previously released *Healthy Watershed Strategy*, noting that a key component of the strategy was developing and implementing TMDLs to manage water quality on a watershed scale. In 1995, EPA released *Watershed Protection: A Project Focus* and *Watershed Protection: A Statewide Approach* to further the premise that many water quality and ecosystem problems are best solved at the watershed level rather than at the individual waterbody or discharger level. In June 1996, EPA's Office of Wetlands, Oceans and Watersheds (OWOW) released *The Watershed Approach Framework*, establishing guiding principals for watershed management. EPA has continued its efforts to promote implementation of clean water programs on a watershed basis with the development of additional guidance, watershed information tools (e.g., Watershed Information Network, Surf Your Watershed), grants for watershed-based programs and projects, and a variety of training courses. In 2002, the EPA Assistant Administrator for Water issued a memorandum "to reaffirm the Office of Water's commitment to advancing the watershed approach". Subsequently, the Office of Water's *National Water Program Guidance* for Fiscal Years 2005, 2006, 2007 and 2008 all included goals to "restore and improve water quality on a watershed basis." As part of this goal, EPA encourages states "to organize schedules for TMDLs to address all pollutants on an impaired segment and to organize efforts so that segment level restorations are clustered together to provide improvements on a watershed basis" (www.epa.gov/water/waterplan/). (5)
- (USEPA 2008) The overall benefit of watershed TMDLs is they provide the opportunity to use the TMDL as a tool for cost effectively identifying options for reducing point and nonpoint source loads to restore impaired waterbodies to water quality standards. By considering all sources impacting the watershed, watershed TMDLs provide the state with the greatest level of flexibility in allocating and subsequently controlling loads. For the watershed TMDL to be most effective, it is important to integrate all of the scientific, programmatic and social aspects of the TMDL within the watershed approach. (8)
- (USEPA 2008) Many of the environmental benefits are a result of evaluating and managing the watershed holistically, allowing for an integrated and comprehensive analysis of sources, impairments, and management options. The benefits are:

  Includes a Broader Source Assessment.

Captures Interaction Between Upstream/Downstream Sources, Impacts.
Reduces the Potential Need for Future TMDLs.
Lower Per-TMDL Development Costs.
Address Greater Number of TMDL Pollutant-Waterbody Combinations.
Encourages Efficient Use of Resources and Completion of Tasks.
More Effective Use of Public Participation and Stakeholder Involvement.
Avoids Potential for Having to "Redo" TMDLs.
Encourages More Comprehensive and Targeted Monitoring Programs.
Provides Opportunity to Integrate TMDL with Other Watershed Programs.
Provides a Framework for More Effective Implementation.
Facilitates Watershed-wide Planning.
Facilitates Use of Innovative Implementation Options.
More Easily Addresses Non-traditional Point Sources.

- (USEPA 2008) The decision to develop a watershed TMDL will be guided by multiple factors that will usually serve to determine the actual scope of the TMDL. Many impairments and impaired segments within a watershed can be "bundled" and addressed through a broader, watershed TMDL. Ultimately, the scope of the TMDL depends on a variety of watershed-specific factors that must be considered in the planning stages. The typical screening criteria for identifying candidate watershed groupings can be seen as three phases:

  The first and most important screening criterion is related to the listing—the impairment, waterbody type, and sources.

  • Type/location/similarity of impairments
  • Waterbody type
  • Expected sources and pathways
  • Priority waters
  • Necessary level of detail or preferred approach, if known

  The next screening level evaluates program commitments such as consent decrees and available resources to further narrow the scope or prioritize the watershed candidates.

  • Consent decrees
  • Priority rankings
  • Public concerns
  • Available resources

  The final screening is based on evaluating the existence of ongoing watershed-based efforts that can define or guide the scope of a watershed TMDL.

  • State planning boundaries
  • USGS boundaries
  • Watersheds from related programs (e.g., 319)
  • Active stakeholder groups