Recovery Potential Metrics Summary Form

Indicator Name: RESTORATION COST

Type: Social Context

Rationale/Relevance to Recovery Potential: The expense of restoration due to the numbers of impaired waters and the complexity of most restoration and remediation techniques is a well known, major factor influencing likelihood of success. Extreme expense may halt progress on a single restoration effort, either directly due to the unwanted financial burden or due to inability to compete with other, less expensive restoration sites as priorities are set. Prioritization often depends as much on economic issues as ecological concerns.

How Measured: Detailed estimates of full restoration cost are not likely to be available, nor necessary for a rough comparison. Expert judgment based on impairment type and number, system type and size may be used to assign high-medium-low expense categories to waters of interest.

Data Source: Not likely to be available in mapped form, although system size, impairment type and numbers from mapped 303(d) data may be used as surrogates for factors commonly affecting cost (See: http://www.epa.gov/waters/tmdl/). Some regional costs for stream restoration projects are compiled in the National River Restoration Science Synthesis database (See: http://restoringrivers.org/newsite/nbii.html).

Indicator Status (check one or more)

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

Examples from Supporting Literature (abbrev. citations and points made):

- (Hillman, M. and G Brierley. 2005) Striving to help rivers adjust naturally provides the most cost-effective and strategic avenue for management programmes.
- (Russell et al., 1997) The socio-political factors that contribute to restoration decisions were not taken into account. Such factors as engineering capability, cost, land ownership, and legal mandates admittedly play a major role in determining if, when, where, and how a restoration project comes into being. Though beyond the scope of this project, these factors could, to some degree, be considered within a GIS environment (66).
- (Walsh et al., 2005) A critical factor in restoration and conservation of urban streams and their catchments is the human population (Booth 2005), suggesting that effective management of these streams will require a broader perspective than traditional stream ecology, one that includes social, economic, and political dimensions (707).
- (Palik et al., 2000) Restoration also requires prioritization of efforts. Prioritization depends as much on economic issues as ecological concerns (Wyant et al. 1995). An organization may prioritize restoration efforts based on current and historical abundance of an ecosystem, giving highest priority, for example, to restoring historically abundant ecosystems that are currently rare. The effort (cost) to restore a particular site is another factor in prioritization; effort depends on degree of similarity to a reference condition. Highly disturbed sites require greater effort to restore than minimally disturbed sites (following the idea of thresholds of irreversibility; Aronson et al. 1993). Effective

approach is to follow a variable width policy that allows variability in riparian protection depending on local factors like land availability, habitat needs, and other community needs. Zoning regulations (Wenger and Fowler, 2000; Grant, 2001) can be used to reduce land disturbance to riparian areas. A variable buffer zone can be identified and protected using regulations. The variable width of the riparian buffer can be determined based on tradeoffs in location-specific benefits and costs of land protection. The recommended minimum width of riparian buffers is 7.6 m. A popular recommendation is to have three zones in a riparian buffer, namely undisturbed forest, managed forest, and the runoff control area (Welsch, 1991), that have a combined width of 30 m. In Massachusetts, a width of 7.6 m is required in urban areas 61 m in rural areas (River Protection Act). Buffer width policies could be developed based on the marginal gains identified in this study. An ideal is to have a variable width (Spackman and Hughes, 1995; Wenger and Fowler, 2000; Corlett, 2001) policy that uses optimal riparian width depending on local attributes. Subsidies and incentives that are spatially targeted can be used to encourage voluntary installation of riparian buffers (1478-1479).