Recovery Potential Metrics
Summary Form

Indicator Name: APPLICABLE REGULATION

Type: Social Context

Rationale/Relevance to Recovery Potential: As many restoration actions are voluntary, particularly nonpoint source control actions, the applicability of a regulatory requirement that adds greater certainty to actions that may partially or fully restore an impairment increases the prospects of recovery. Formal enforceable mechanisms not only improve the likelihood of pollution reduction directly, but also may encourage restoration partners and other restoration efforts affecting the same waterbody, in the knowledge that at least some progress will be made. One easily assessed example includes point source permitting, but several other state or federal regulatory links may influence impaired waters.

How Measured: Data availability varies according to the regulation, but the link to enforceable point source controls is one well documented regulatory connection. Assessing this metric may be done as simply as distinguishing impaired waters that are nonpoint only from waters with some or all point sources, and this can be drawn from available GIS coverage of listed waters or TMDLs. Specific states or areas may have other regulations (e.g. riparian zone protections, conservation zoning) that may be directly mapped or can be extracted through mapping.

Data Source: EPA's ATTAINS data system (See: http://www.epa.gov/waters/data/downloads.html) geo-spatial data on 303(d) listed waters includes point source information subject to enforceable permits as attribute data. Data available from the Assessment TMDL Tracking and Implementation System (ATTAINS) (See: http://www.epa.gov/waters/ir/) contains information on 303(d)-listed waters by state and by semi-annual reporting cycle. Online via state or EPA websites (see also http://www.epa.gov/waters/tmdl/expert_query.html) identify impaired waters and waters with completed TMDLs as point source only, nonpoint source only, or mixed. Coastal information is available through NOAA's Legislative Atlas (See: http://csc-s-maps-q.csc.noaa.gov/legislativeatlas/index.html). For further regulatory information, the EPA has compiled a list of regulations by environmental topic (See: http://www.epa.gov/regulations/envtopics/index.html). Zoning maps are typically available from county and state sources.

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.

Comments: Operational, should be customized at the state level to reflect the locally applicable regulatory connections

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

- (Leach and Pelkey 2001) themes relating to watershed partnership success include [note that **bolded ones** are spatially representable for recovery screening with existing data while others are usually not available as spatially explicit data]: **funding, broad and inclusive membership,** committed participants, **effective leadership,** bottom-up leadership vs balanced among levels, trust, low or moderate conflict (vs none),

geographic scope, limited scope of activities, adequate time, well-defined process rules, consensus rules, **formal enforcement mechanisms, effective communication, adequate sci-tech info,** monitoring data on outcomes, training in collaboration, **agency support and participation**, **legislative encouragement, community resources**.

- (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).
- (Ekness and Randhir 2007) A spatially variable policy that is based on stream order, riparian distance, and land use can be used to maximize watershed ecological benefits. Wider riparian zones with variable widths, protection of headwaters and lower order subwatersheds, and minimizing disturbance in riparian and headwater areas can be used in watershed policy. These management objectives could be achieved using targeted economic incentives, best management practices, zoning laws, and educational programs using a watershed perspective (1468).
- (Ekness and Randhir 2007) The riparian width that has maximum habitat gains may not always be possible in most watersheds. An effective approach is to protect riparian areas with maximum possible riparian width, to protect all four vertebrate groups. Another 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).