Recovery Potential Metrics
Summary Form

Indicator Name: WATERSHED COLLABORATION

Type: Social Context

Rationale/Relevance to Recovery Potential: A metric of collaboration is related to watershed organizational presence, but goes beyond in providing a measure of involvement and cooperation by diverse interests. As conflicting interests commonly are responsible for watershed restoration failures, successful bridging across differing interest groups is a positive indicator of prospects for success. This can be in the form of one organization but is dependent upon broad and inclusive membership and inclusive procedural rules for its legitimacy.

How Measured: Likely needs to be scored as presence/absence of a multi-interest organization and/or process.

Data Source: Although some spatial data on watershed and landowner organizations may be available (e.g., the EPA ADOPT database, See: http://cfpub.epa.gov/surf/locate/index.cfm), complete spatial data on this metric is not likely to be available. Rather, other sources may be needed to verify collaboration through other information from watershed to watershed. Likely this metric needs to be scored as presence/absence of a multi-interest organization and/or process. If evaluation involves a small number of watersheds or the watersheds are all well-known, it may be possible for a group process to rank each as high/medium/low.

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: Pilot. Underlying significance of the metric is strong, but choice of a meaningful measurement as well as obtaining consistent data can be challenging.

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

- (Hillman, M. and G Brierley. 2005) Developing and implementing a vision for river rehabilitation is a catchment-scale task that works with the connectivity of biophysical processes across multiple disciplines, scales and dimensions (Boon, 1998; Rutherfurd *et al.*, 1998). Perhaps the most fundamental change to river management practice that is evident in the emerging paradigm is the transition from top-down government-imposed frameworks to adoption of community-based participatory approaches. Perhaps most importantly, a high level of community participation is required for adaptive management to function effectively (Habron, 2003) Probably the most widely recognized element of recent stream rehabilitation programmes has been the emphasis on what is variously called participation, partnership, community involvement or multistakeholder processes (Hemmati, 2001; Guice, 2002). The basic assumption here is that if practitioners are sufficiently engaged and empowered in the decision-making process, the task of achieving appropriate environmental outcomes is enormously enhanced. A fundamental precept is that the community owns, drives and integrates the programme (Cullen, 1997). Social and environmental justice require that key actors and genuine representatives be identified (Dourojeanni, 2001), that there be equitable representation and power between stakeholders (Oliver, 2000; Watson, 2001), that there be open and transparent discussion (Hilden, 2000) and that all stakeholders be included in decision-making processes (McNally and Tognetti, 2002).

- (Sabatier 2005) p. 14 Causally prior factors [affecting collab wshed mgt success] are socioeconomic, ecological, civic and institutional conditions predating the effort. This context heavily affects the approach and probability of success. [Process as used here implies institutions for the actions being discussed]
- (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**.
- (Poiani et al., 2000) In the human arena, implementing conservation across multiple scales requires unprecedented levels of coordination among federal, state, and local institutions, both public and private (141).
- (March et al., 2003) Effective water resource management demands interdisciplinary collaboration involving economists, ecologists, civil engineers, anthropologists, and policymakers (Ewel 2001) (1077).
- (March et al., 2003) Ecologists can also improve water resource management by collaborating with economists to provide research results that integrate the economic and ecological costs of various management scenarios (Richter and Redford 1999). Such collaboration would provide more of the information that policymakers and water resource managers need to make decisions (1077).
- (Pringle 2001) Long-term management of the Danube Delta Biosphere Reserve depends on effective, integrated watershed management and international cooperation, not only among the 12 countries in the Danube's watershed, but also among those in the Black Sea watershed that encompasses the Danube drainage (984).
- (Palik et al., 2000) A second landscape consideration is that assessments of ecosystem abundance and diversity, as well as prioritization of restoration efforts, require a *regional perspective.* The efforts of neighboring landowners in restoring or degrading rare ecosystems may influence prioritization decisions in the focus landscape. In the case of Ichauway, the bordering landscapes are largely under intensive agriculture. Consequently, Ichauway assumes regional importance as a center for conservation of biological diversity. In this sense, all the disturbed ecosystems of Ichauway have high-priority status for restoration. In reality, limited budgets and time dictate the need for the multi-level prioritization approach we present. In other regions, rare ecosystems in a focus landscape may be abundant on surrounding ownerships. If this is the case, it may be desirable to prioritize restoration efforts in the focus landscape to better meet objectives not being pursued by other regional ownerships. In either case, cross-ownership planning will facilitate regional restoration efforts by helping to focus priorities and make the best use of limited restoration dollars (201).
- (March et al., 2003) A holistic, flexible approach based on long-term monitoring, collaboration, and communication with the public will aid the sustainable management of tropical island water resources (1077).
- (Groffman et al., 2003) The creation of the Gwynns Falls Trail is an excellent example of how social, physical, and biological sciences can be integrated in an effective way in an urban ecosystem. The motivation for its creation was social and biophysical degradation. A US Army Corps of Engineers study had chronicled extensive degradation of streams and riparian zones in Baltimore City, including poor riparian and instream habitat, streambank and bed stability problems, and inferior water quality. At the same time, neighborhoods were undergoing socioeconomic decline; nearly 50% of the population of

Baltimore City was lost between 1940 and 1990, leaving over 60 000 abandoned houses and lots (319).

One of the main objectives of the project was to develop the idea that ecological revitalization can stimulate socioeconomic revitalization by bringing people in underserved (poor) neighborhoods together through community forestry and stream restoration projects. These projects foster community cohesion, which leads to community interest in improved city services. The increase in services, in turn, leads to improvements in environmental and socioeconomic conditions and creates positive feedback for neighborhood revitalization, reversing the negative spiral of population loss, environmental and social degradation, and further population loss (319-320).

- (Lake et al., 2007) In current stream restoration efforts, there may be an awareness of principles established in stream ecology. These include the crucial importance of connectivity, of having sufficient flows, of the need for effective energy and nutrient processing, of providing appropriate habitat, and of natural and anthropogenic disturbances. However, it is rare to see such ideas specifically mentioned in stream restoration work. This lack of recognition may reflect the lack of ecologists involved in restoration projects, the fear by practitioners that experimentation and monitoring may disrupt the project, or the lack of sufficient benchmarks and insufficient knowledge on the ecology of natural rivers, especially floodplain rivers (Ward et al., 2001) (608).
- (Lake et al., 2007) In the planning stage, it is essential that there are inputs from a range of relevant disciplines (e.g. hydrology, geomorphology, biogeochemistry, statistics) and interests (resource management, economics, local stakeholders) (608).
- (Palmer et al., 2005) How far the restoration project will move a system towards the guiding image will depend on many factors, some of which are non-ecological (e.g. existing infrastructure limitations, stakeholder needs and values, available funding). Additionally, constraints often exist at the catchment scale, including constant factors such as flow barriers (press disturbances) and spasmodic events (pulse disturbances) such as sediment inputs (Bond & Lake 2003). A clear understanding of scale and severity of constraints is needed in order to prioritize restoration activities and arrive at a co-ordinated scheme of activity for the entire catchment (Bohn & Kershner 2002; Roni *et al*. 2002). In some cases, the large-scale constraints are so severe that one must question whether restoration of single reaches is an appropriate use of valuable resources. However, with sufficient watershed planning, the cumulative effects of multiple projects may yield great ecological benefits. Individual projects that are part of a large restoration scheme should be evaluated within the larger context, particularly to determine the effects on other regional projects (211).
- (Filipe et al., 2004) Once reserve areas have been selected, they must be integrated within a basin management approach to harmonize development opportunities and exploitation of aquatic resources (Meffe 2002). There is also a need for ecologists, conservationists, social scientists, and stakeholders to negotiate use rights (Cullen et al. 1999). In multinational water bodies, such as the Guadiana River basin, international collaboration is needed and all social, economic, and political constraints should be considered. Additionally, the establishment of discrete reserves is not enough to protect freshwater fishes (Angermeier 2000; Meffe 2002). Interventions upstream or downstream must be considered in the management of reserves because these activities could have implications for the species for which the reserve is designed (Cowx & Collares-Pereira 2002). In particular, the construction of a dam outside of the reserve network has implications for the recolonization of each reserve area because it may disrupt migration pathways. Similarly, the introduction of alien species elsewhere in the watershed may have long-term implications if the introduced species is able to disperse into the reserves. In our case study, the Alqueva and Pedrogao reservoirs will create unsuitable habitats for native fishes by affecting their movement and enhancing the populations of exotic species. In addition, the lack of facilities for fish passage around Alqueva has permanently isolated the populations upstream and downstream of the dam (197).

- (Barker et al., 2006) This patchwork implementation of buffers poses enormous difficulty for determining the effectiveness of buffers – and for making the decisions that allocate funds for projects (2).