Recovery Potential Metrics
Summary Form

Indicator Name: SPECIES RANGE

Type: Ecological Capacity

Rationale/Relevance to Recovery Potential: Although single-species oriented, this metric is appropriate where a restoration target, or even a water quality criterion, directly addresses a species of concern (e.g., naturally reproducing salmon or trout populations), or indirectly alludes to an aquatic condition exemplified by a keystone species (e.g., Eastern Brook Trout exemplifying a coldwater biotic community target). The rationale regarding recovery is that a waterbody occurring in marginal habitat that approaches an extreme of species range generally represents greater stressors and higher risks to restoration efforts than non-marginal range locations. Marginality concepts may be numerous (e.g., northern or southern extremes; elevation; waterbody traits such as size, channel gradient, substrate; precipitation regime) and need to be selected appropriately for the species of interest.

Climate change effects – both global processes and local, man-induced processes that approximate global effects (e.g. water temperature regime changes due to development and vegetation removal) – may act to make marginal range areas additionally unsuitable and difficult to restore.

How Measured: Dependent upon the species and range characteristics. Generically, marginal range should be defined on the basis of local expert opinion or on species biology, and should be translatable into 'buffering' (e.g., within 100 km of southern range border) or thresholds (e.g. not found below 5,000 ft elevation) for measurement with GIS. Convenient scoring units would be:

0. not within species range
1. marginally within species range
2. clearly within species range

Data Source:
Dependent upon species range maps, which are often very generalized. Modification may be necessary by consulting with local experts on the species of concern. Threatened and Endangered Species Habitat can be found through the USFWS Critical Habitat Portal (See: http://criticalhabitat.fws.gov/). Historical information may be available through State Fish and Wildlife Service, as is the case in Oregon (See: http://www.fws.gov/oregonfwo/Species/Data/). Biodiversity organizations and state natural heritage programs may have data on other major aquatic taxa of interest.

Indicator Status (check one or more)

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

Comments: Generally widespread but may be data-limited. Sound in concept.

Supporting Literature (abbrev. citations and points made):

- (Poplar-Jeffers 2009) Several studies have noted high rates of movement by stream resident trout (Riley et al. 1992; Gowan & Fausch 1996; Burrell et al. 2000; Petty et al. 2005). For example, within the upper Cheat River basin, West Virginia, adult Brook trout

prefer to spawn in small tributaries (streams with drainage areas <3 km2). However, Brook trout commonly undertake large-scale movements into larger water bodies in response to seasonal changes in temperature and food availability (Petty et al. 2005). Consequently, stream restoration that focuses on removing dispersal barriers has the potential to greatly enhance Brook trout productivity.

- (Poplar-Jeffers 2009) In a recent study, Petty et al. (2005) found that the watershed scale dynamics of Brook trout populations are strongly dependent on interconnections between spawning habitats in small headwater streams and foraging habitats in larger river main stems. Barriers to fish movement, therefore, can have a profound negative impact on Brook trout productivity (Petty et al. 2005). Consequently, we concur with Gibson et al. (2005) that fragmentation and habitat isolation, such as that caused by culverts, should be considered as seriously as other factors, such as fisheries overexploitation or forestry and agricultural practices.