Coarse Filter/Fine Filter
Planning Approaches to the Conservation of Biological Diversity

Background

Since inception of coarse/fine filter concept for conserving biological diversity (TNC 1982), there has been an evolution in interpretation and application of the concept. Originally (TNC 1982), the concept of conserving entire plant and animal communities in reserves was viewed as an efficient coarse filter approach to conserving biodiversity that would protect 85-90% of all species. The complementary fine filter approach focused on conserving individual rare or specialized species that slip through the coarse filter and are not necessarily protected in the reserves (Noss 1987, Hunter 1991).

Limitations in the community concept were identified by Noss (1987) and recommended a coarse filter approach that focused on levels of organization above the homogeneous community type to include landscape level ecological phenomena (including disturbance regimes) and heterogeneity. Hunter et al. (1988) also suggested that plant communities are not sufficiently independent to be considered separate components of biodiversity. He recommended maintenance of a diverse representation of physical environments in a system of reserves to maintain a majority of species diversity as a coarse filter approach to conservation of biological diversity.

The coarse filter has recently evolved to a concept of conserving species diversity by providing adequate representation (distribution and abundance) of ecological land units considering the historical range of variability based upon an understanding of the natural disturbance regimes of the ecological land units (Haufler et al. 1996). This coarse filter approach does not necessarily prescribe reserves, but rather recognizes ecological processes and provides for a dynamic distribution of ecological units across the landscape over time. Individual species (species at risk, special interest) fine-filter assessments are conducted to evaluate whether sufficient amount and distribution of habitat is provided under the coarse filter strategy. Thus a coarse filter strategy has been viewed both as a reserve system and as an approach to managing dynamic landscapes considering natural disturbance regimes.

NFMA Planning Rules

Because of the differing interpretations of what specifically represents a coarse filter conservation strategy, a coarse/fine filter approach should be viewed as a conceptual planning process. This process first seeks to improve planning efficiency by adopting a coarse filter (landscape/ecosystem) approach that maximizes the conservation of elements of biological diversity. The specific coarse filter prescription/design will vary depending upon the scale of planning, level of information, and specific conservation issues. Three conceptual alternatives identified in the scientific literature and applied to land management planning are identified below. A complementary fine filter approach focusing on individual species or fine-scale elements of diversity is used to identify and conserve elements of diversity not accounted for under the coarse filter strategy.

A coarse filter component to land management planning is necessary to improve planning efficiency and avoid a complete species by species planning process. The 2000 Revised planning rule prescribed one coarse filter solution to address Ecosystem Diversity – managing for the Range of Natural Variability (RNV). An earlier version of the draft rule (Sept. 1998) used RNV only to establish an ecological context but required that management actions should emulate the effects of natural disturbance events characteristic of an ecosystem. Recent broadscale planning efforts have successfully addressed species viability, biodiversity, and ecosystem diversity using a one or more focal species to design multiscale landscape conservation strategies. Thus no one prescription may satisfy all situations.

A more robust and flexible coarse filter approach to a NFMA planning rule would be to provide several options to provide for the diversity of plant and animal communities. One or more of the following three approaches must be used alone or in combination to design a coarse filter for Ecological Sustainability/Ecosystem Diversity:

1. Manage ecosystems considering/within the Range of Variability (2000 Rule; Aplet and Keeton 1999, Haufler 1994, Haufler et al. 1996, Landres et al. 1999, Morgan et al. 1994. Poiani 2000, Swanson et al. 1997, Wright et al. 1995). The assumption of managing for RNV as a coarse filter approach is that restoring or maintaining landscape conditions within distributions that organisms have adapted to will most likely conserve biodiversity and produce sustainable ecosystems (Manley et al. 1995).
2. Management activities should attempt emulate the effects of natural disturbance processes and use the range of variability to establish an ecological context. (Sept. 1998 Version of draft revised Planning Rule; Engstrom et al. 1999, Everett and Lehmkuhl 1999, Haufler 1994, Morgan et al. 1994, Samson and Knopf 1994, Samson et al. 1997, Urban et al. 1987:).
3. Develop conservation strategies predicated upon the habitat needs of one or more focal species (Lambeck 1997; e.g. NW Forest Plan – spotted owl used to initially design landscape conservation strategy; Tongass Plan Revision – 5 focal species used to design a multi-scale (see Poiani 2000) old growth forest strategy)

Once one or more coarse filter approaches are designed among planning alternatives for consideration and evaluation. Species at risk are assessed against these coarse filter approaches, and where those approaches that fail to provide a high likelihood of maintaining ecological conditions to support viable populations, specific fine filter (species specific) standards or strategies must be developed. Using a coarse filter approach with species assessment (Haufler et al. 1996) was an explicit design of the Sept. 1998 version of the Planning Rule.

Literature (representative but not comprehensive)

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6/4/01