Conserving Large Landscapes:

Science to Support Proactive Conservation Planning

Northwest Boreal Landscape Conservation Cooperative

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Tools to Support Active Adaptive Management

Active adaptive management is a systematic approach to landscape management where human activities are treated as management experiments. This approach allows us to learn while doing so that we may understand the effects of land and resource management decisions on biodiversity.

Management experiments require control areas — nearby intact regions that serve as a baseline (Fig 1). These control areas, called **Ecological Benchmarks**, allow us to distinguish the response of biodiversity to management practices from variation due to natural causes and/or climate change.

Ecological benchmarks are one element of the Conservation Matrix Model (CMM, Fig 2), a pro- active and science-based approach to landscape sustainability.

Treatment
Region Subject to Management Action

Control
Ecological Benchmark

Figure 1. Ecological benchmarks are controls for management experiments.

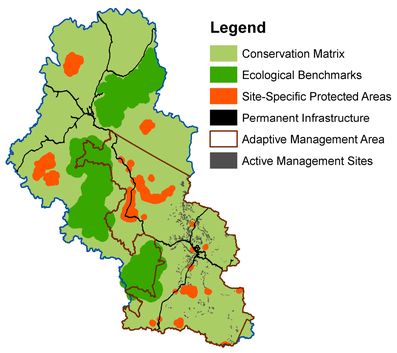

Figure 2. The CMM is pro-active and encourages stewardship and innovation through integrated and active adaptive management. It recognizes the critical contribution that all landscape elements make towards achieving conservation and sustainability, ranging from intense development to protection. Landscape elements include ecological benchmarks, site-specific protected areas, adaptive management areas and active management sites, and the conservation matrix.

Benchmarks for the Northwest Boreal

The design of ecological benchmarks considers landscape condition, natural disturbance, terrestrial and hydrologic connectivity, representation of landscape variability, focal species habitat, and resilience to climate change. The boreal region of Alaska and Northwestern Canada (NWB planning region, Fig. 3) has high potential for the establishment of a comprehensive benchmark network, with contributions from existing protected areas. Benchmark networks were identified for 31 ecoregions (Fig 3), and there are numerous network options to select from. The design and selection of candidate benchmark areas can be further refined based on cultural and socio-economic values, or other attributes. (Fig 4).

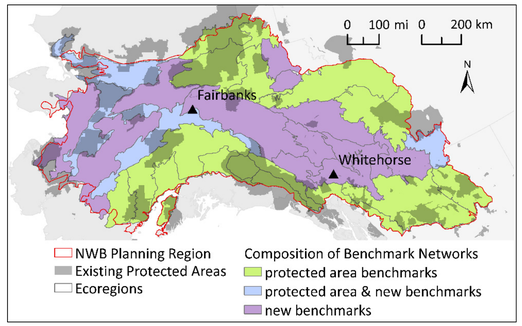

Figure 3. Existing protected areas are sufficient for establishing benchmark networks in 15 of 31 ecoregions (green). Protected areas must be augmented by new areas to complete benchmark networks in 4 ecoregions (blue). The remaining 12 ecoregions (purple) require benchmarks networks comprised entirely of new areas.

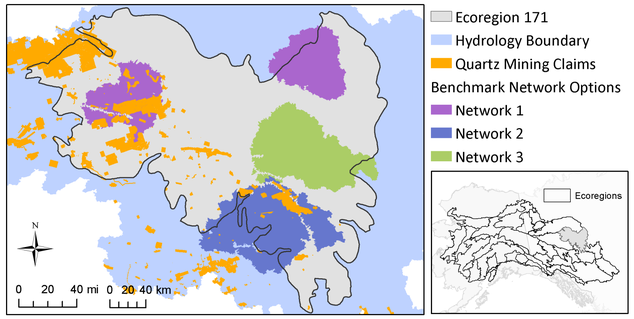

Figure 4. Benchmark networks can be ranked based on minimizing conflict with socio-economic interests, as such quartz mining. In the example above, spatial overlays of quartz mining claims with various options for future ecological benchmarks (Networks 1, 2, 3) show that Network 3 has the least conflict with mining, and would be an ideal area to use as a benchmark.

Potential Application

The Bureau of Land Management (BLM) has included ecological benchmarks in preliminary land use proposals for the Central Yukon Planning Area in Interior Alaska (Fig 5). BLM intends to use benchmarks as a baseline for landscape-scale monitoring of aquatic and terrestrial indicators, in part, to inform condition assessments and reclamation requirements for authorized uses throughout the planning area.

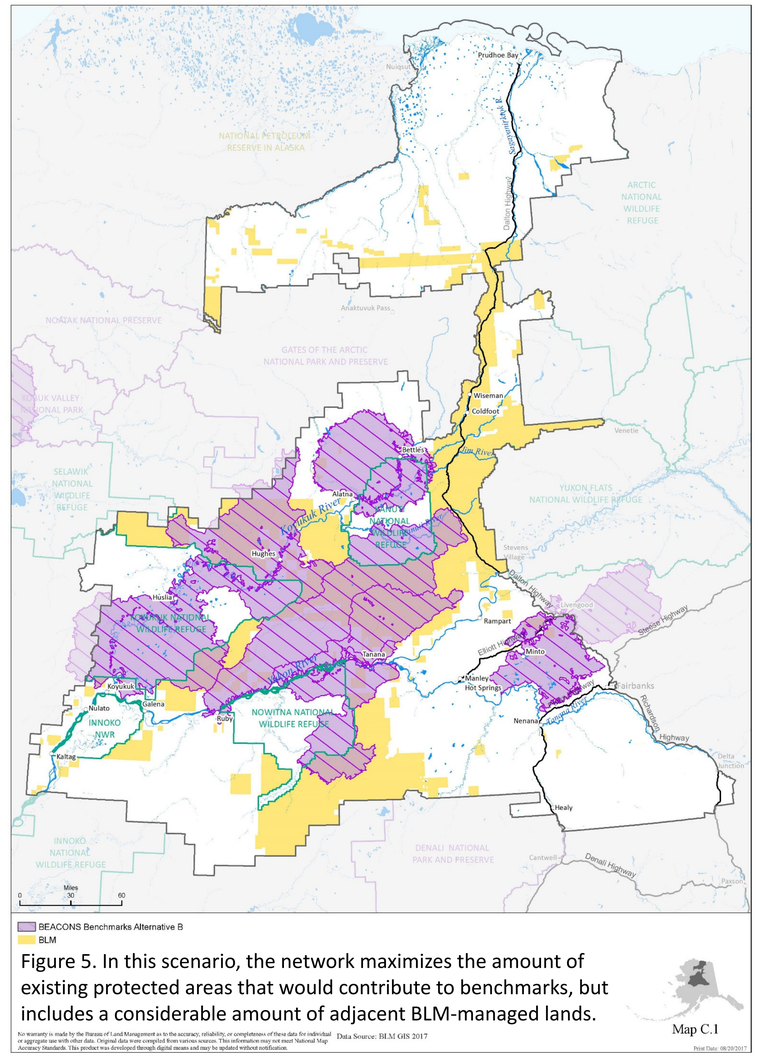

Figure 5. In this scenario, the network maximizes the amount of existing protected areas that would contribute to benchmarks, but includes a considerable amount of adjacent BLM-managed lands.