Setting Conservation Targets in the South Okanagan-Similkameen

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Extended Abstract: The valleys of the South Okanagan and Similkameen Rivers are patchworks of various habitat types, modified to varying extents by human and other biological agents, and populated by the greatest concentration of endangered species in Canada. The South Okanagan-Similkameen Conservation Program guides the recovery, stewardship, land acquisition, and outreach activities of its member organizations in this area. This paper describes the tools developed to target the portions of the landscape that are most critical for recovery of the overall landscape.

Terrestrial Ecosystem Mapping identified and mapped irregular polygons of 110 different habitat types based on soil characteristics, terrain features, ground cover, and tree and shrub types. Habitat suitability models were then developed based on the known occurrences of 29 vertebrate species on British Columbia's Red and Blue Lists, and on the habitat at those known sites of occurrence.

The *Habitat Atlas for Wildlife at Risk* (B.C. MOELP 1998) shows the total distribution of suitable habitat for each of the 29 species, and sets conservation goals for four broad categories of habitat (dry forest, grassland, wetland, and rough terrain); however, the *Atlas* provides no indication of what subset(s) of the lands within the South Okanagan-Similkameen region would, assuming limitations on acquiring conservation lands, provide the maximum protection for the 29 species. Complementarity analysis uses algorithms in an iterative process to do just this. Additionally, complementarity analysis can calculate objective measures of the extent to which any particular parcel of land is essential to conserving a species or group of species.

The initial complementarity analysis was based on the Terrestrial Ecosystem Mapping and habitat suitability models, and on the target of maintaining populations of the 29 species at existing levels without regard to the conservation status of each polygon. The minimum set of mapping polygons needed to achieve this target covered 37% of the study area, and 15% of those polygons were found to be already under some form of protection. The next step was to look back and see how far short existing conservation areas fell in achieving the desired target. The requirements of 21 of the 29 species were found to have been met by existing conservation areas

alone. Next, the minimum set of polygons needed to complement the conservation lands was determined, but this time, regular 2-km^2 hexagons were used as the units of selection rather than the original Terrestrial Ecosystem Mapping polygons. Those polygons varied greatly in size, and the inclusion of polygons too large or too small for the species requirements distorted the initial results. The minimum set of regular hexagons needed to achieve the target now covered 44% of the land base, and 37% of those polygons were already in conserved lands; a further 14% contained some conservation lands, and the remaining 49% required protection. Setting the conservation targets higher (i.e., for larger populations) required greater proportions of the land base. The land area needed to conserve the 29 vertebrate species did not cover the known distributions of 31% of the rare plant species or 40% of rare invertebrate species that occur in the region.

An alternative approach was to consider the extent to which each of the Terrestrial Ecosystem Mapping habitat types has been reduced since the initial immigration of European settlers in the mid-1800s. This was done using air photos from 1935 and extrapolation based on expert opinion. Because it was difficult to differentiate between some of the habitat types on air photos, only 50 of the initial 110 types were used. Based on the complementarity analysis presented here, and on a growing number of other such analyses that have generated similar results, a goal of conserving 40% of the 1850 coverage of each of these habitats was set as the target for recovery of all endangered and threatened species. The mapping process revealed which habitat types have been reduced to below that 40% target. These habitats will clearly require restoration, and all extant patches can be pinpointed and designated as crucial for conservation in the South Okanagan-Similkameen region. A further group of habitat types which have been reduced to 40–70% of their historical extent are at the next level of priority for conservation action. The known occurrence of a species at risk in any particular polygon can be used to target that polygon for protection.

A number of refinements can be made to these analyses to make them even more effective in setting and achieving conservation goals. The importance of particular polygons as corridors or for other ecosystem functions can be added to the selection criteria. Adding landownership to the database will help focus the efforts of South Okanagan-Similkameen Conservation Program's stewardship, securement, and sustainable land-use teams. Arguments for how much and which particular parcels of land in the South Okanagan-Similkameen need to be protected to ensure recovery of species at risk will be greatly strengthened if the outputs from the complementarity and habitat representation analyses can be shown to be congruent.

References

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