Spatial modelling and the identification of potential habitat

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Under the Canadian Species at Risk Act (SARA), recovery strategies and action plans are required for listed species in order to initiate protection measures. This requires a summary of the ecological parameters of the species, identification of critical habitat, identification of potential areas of occurrence and more. Of these, identification of potential areas of occurrence is one of the most important first steps. Targeted searches may reveal more populations than expected, or may highlight the extreme vulnerability of a species.

In preparing a recovery strategy for tall bugbane (Actaea elata) in Canada for the Tall Bugbane Recovery Team, we summarized the ecological parameters for the species in BC. Then, using GIS modeling, we combined the ecological parameters for the species with additional available spatial data sets to produce predictive mapping that would allow us to identify additional potential habitat for the species in the province.

GIS modelling is commonly used to aid in identification of potential habitat for a species. However, how confident can we be in the results of the habitat modelling exercise? The quality of the results depends upon several factors that are typically poorly known for rare species. For example, in the case of tall bugbane, only ten recently verified sites were identified for the species in BC, and the characteristics of these sites differ in subtle ways from the characteristics of known sites for the species in the southern (US) parts of its range. Our knowledge of the species ecology is still limited in certain key areas, which precludes developing a finely-tuned ecologically-based model of the species' potential habitat. Furthermore, the spatial data that we have available (e.g., soil maps) is typically not at the level of resolution required for the identification of fine-grained potential habitat

In this study, we explored the reliability of predictive modelling using the available spatial data layers for tall bugbane. In order to assess how precise we could be in identifying potential habitat for tall bugbane, and whether or not the identification of potential habitat using such limited information sources is an appropriate exercise, a sensitivity analysis was conducted on the model.