Climate change adaptation, facilitating action on the ground

Effective forest management begins with an understanding of historic forest conditions and associated ecological processes. It also requires an understanding of the potential range of plausible trends over time, including the powerful influence of climate change. However, incorporating assumptions of climate change into forest management planning is a daunting task replete with uncertainty. Nevertheless, it is necessary as the effects of management under climate change can have profound effects on the health of British Columbia's forests and forest industry, as shown by the mountain pine beetle epidemic. A collaborative effort by forest practitioners and UBC researchers is embracing this uncertainty in the Kamloops Timber Supply Area (TSA).

The Kamloops Future Forest Strategy (K1) was launched in 2007 as an initiative of the chief forester to help create a vision for a resilient future forest under climate change and to develop a strategy for achieving such conditions. The pilot project, led by the Symmetree Consulting Group, used climate envelope mapping to facilitate broad stakeholder dialogue on ecosystem and management vulnerabilities to climate change in the Kamloops TSA.

These important discussions produced a framework for the development of objectives, targets and indicators incorporating scientifically-based assumptions of climate change. The outcome was a series of recommendations for biogeoclimatic subzone groupings as well as for a number of forest values, providing direction for planning processes (eg Timber Supply Reviews, Sustainable Forest Management Plans, Forest Stewardship Plans) to mitigate the effects of climate change and move toward the desired conditions of the future forest.

K1 was a critical first step for understanding the implications of climate change on the forest and range values of the Kamloops TSA. It was also an important milestone in that it brought together for the first time a variety of local groups to seriously consider climate change in the context of forest management.

Dr Harry Nelson of the Department of Forest Resources Management is leading a UBC research team collaborating with Symmetree Consulting Group

Fireweed and lodgepole pine regenerating after a recent wildfire

Mountain pine beetle affected stands near Kamloops BC

on the second phase of the Kamloops Future Forest Strategy (K2), funded under a grant from the Future Forests Ecosystem Science Council. The UBC team includes Drs Anne-Hélène Mathey, Clive Welham, Brad Seely and Stewart Cohen as well as David Pérez and Dr Craig Nitschke. This two year extension (2009 – 2011) of K1 is utilizing process-based computer models (TACA, ForWaDy, FORECAST, and DYNA-PLAN) to answer specific species, stand, and landscape level questions that could not be answered in K1. The goal is to generate more robust, credible and useful knowledge for the adaptation of the existing management framework in BC to changing ecological conditions.

K2 steps beyond the K1 framework of climate envelope mapping through the use of stand and landscape level models that directly incorporate forest regeneration and growth dynamics, as well as the effects of management actions to simulate outcomes under different climate change scenarios. These outcomes can be used to test assumptions and explore potential management actions.

A critical component of this project has been regular consultations with local stakeholder groups from the Kamloops TSA to identify goals toward their vision of the future forests. In turn, this has enabled the development of meaningful objectives and indicators as well as a prioritized list of questions to inform the modelling process. Local involvement has been invaluable for facilitating a shared understanding of modelling assumptions and limitations as well as promoting transparency. This will enable forest practitioners to take the results and use them to guide their forest management planning.

Lupins in an open stand of ponderosa pine

It is the intent of this project that the experience and methodology employed in K1 and K2 will be adapted for use elsewhere in an effort to increase the adaptive capacity of forest management throughout British Columbia.

To date, the Kamloops Future Forest Strategy has produced preliminary recommendations appropriate for forest management under conditions of climate change uncertainty. The specific recommendations encompass a suite of forest values and are useful for evaluation of the feasibility of adaptive forest management implementation under the existing policy framework in BC. David Pérez, a graduate student in the Department of Forest Resources Management, is using these outcomes to understand and address the gaps and barriers to implementation under the present administrative framework. His findings will facilitate the effective and meaningful transfer of research on adaptive forest management to action on the ground.

Further information on the work of the K2 research team is available at www.K2KamloopsTSA.com. David Pérez is a member of UBC Forestry's Sustainable Forest Management Research Group and can be reached at dpforestry@gmail.com.