Alberta Beetle Battle Heightens Focus on Affected Forests

Alberta's battle against mountain pine beetle is moving beyond the province's aggressive control strategies to include increasing focus on rehabilitating forests affected by infestations. At the same time, determining best approaches to restoring ecosystems damaged by beetle can mean answering as many questions as there are bugs in a freshly-attacked tree.

The multitude of unknowns and options faced by Environment and Sustainable Development's beetle decision-makers was highlighted at a recent mountain pine beetle information exchange involving research scientists, academics and government representatives from Alberta, British Columbia, Saskatchewan and Colorado.

Hosted at the University of Alberta by the Foothills Research Institute's Mountain Pine Beetle Ecology Program, the two-day session featured updates on the status of beetle infestations in western Canada and the central United States, plus presentations on challenges facing successful rehabilitation of affected forests.

"Rehabilitation is more than planting trees," explained Darren Tapp, Executive Director of ESRD's Forest Management Branch, who provided the session with an overview of factors that will help determine the best actions to restore beetle-killed landscapes.

Over the past two years, Alberta has allocated $14 million towards rehabilitating forests in the wake of mountain pine beetle infestations, as part of the province's broad strategy to fight the insect's impacts. Alberta has about six million hectares of pure and mixed pine forests, and it is estimated that beetles have affected about one-quarter of that total to lesser or greater degrees.

The priority for Alberta's work to rehabilitate beetle-killed forests, Tapp noted, is to restore the ecological function of affected area. But even this broad goal offers more questions than answers.

"Where do we do it, for what purpose, and to what extent?"

He continued: "First we have to ask ourselves, what is the desired future forest? Do we mimic what was there in the past or do we introduce change in anticipation of future conditions and to reduce the potential for future infestations? These are big questions, and we need strategic answers."

Other factors at play in answering the big questions include wildlife habitat needs, tree species composition in the new forests, even-age versus mixed-age stands, forest hydrology concerns, recreation needs, the impact a changing forest might have on the sustainability of Alberta's forest industry and forestry-dependent communities, and to what degree rehabilitation should rely on natural regeneration versus human-aided efforts.

Information presented at the two-day forum addressed many of these questions, largely from the point of view of the lines of enquiry scientists are pursuing in attempts to find answers. For

example, topics of discussion included work underway to define the point at which forest managers should walk away from rehabilitation, in order to focus efforts and scarce resources on sites with greater potential for effective restoration, and how regeneration success can be compromised by having too many surviving trees in a stand, denying much-needed sunlight to new growth through intense competition.

Other topics included an overview of predictive models to estimate rates of spread of infestations, research underway into cold tolerance of beetles, impacts of hydrological change on pine forest restoration and development of monitoring tools to detect beetles at low infestation densities.

The session was a good opportunity to assess progress on priority research questions and to identify new areas where answers are needed, Tapp said, noting that defining the crux of rehabilitation issues is an important, ongoing step in Alberta's fight against beetles and to ensure functioning ecosystems today and into the future.

Priorities for the province are getting the foundations in place to make the strategic rehabilitation decisions required, he explained. A comprehensive MPB killed pine inventory is necessary to understand the full magnitude of the impacts. Also necessary is the establishment of well-designed research questions in conjunction with academia, industry and within government to inform our future decision making.

"These are big questions, and we may not have the entire array of answers, but we need to ensure the actions we take provide future forest managers with at least the same set of choices as we have today," Tapp said.

- **Population Forecast Survey Map 2014**