Swan Valley Forest Management Plan Newsletter

LP BUILDING PRODUCTS

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Welcome to the Newsletter

Welcome to Part 2 of the Scenario Planning Newsletter. In the last issue we focused on describing scenario planning and some of the tools LP Swan Valley is using to develop its Long-Term Plan. This issue will focus on a public participation workshop and results of the analyses presented to the workshop participants.

Scenario Planning Workshop - Round 1

As LP Swan Valley develops its Long-Term Plan (20 years), a critical element is the incorporation and consideration of input from the public. In forest management planning, the public is often referred to as 'stakeholders' since they have a 'stake' in what happens on public (Crown) land, and a right to participate in planning for activities on that land. LP has two stakeholder groups in place, one based in Swan River – The Stakeholder Advisory Committee (SAC) and the second based in Winnipeg – the Community of Interest Advisory Committee (CIAC). Both committees are made up of special interest groups (Non-Governmental Organizations or NGOs), individuals, academics and government representatives. Both committees assist LP with the development and review of operational and strategic level plans. Since 2002, LP has held a series of meetings to discuss the Long-Term Plan with these groups, keep them informed of progress and seek direction for ongoing work. This culminated in November 2004 with a 2 day workshop with more than 70 participants.

The objectives for the Round 1 Modeling Workshop included opportunities to:

- review preliminary modeling results from three draft management scenarios,
- test different approaches to forest management to see how different combinations of practices affect results,
- provide an opportunity for the public to describe forest values and practices they are concerned about for use in Round 2,
- demonstrate how the Patchworks computer model can be applied to forest management planning, and
- develop an additional scenario based on participant input for demonstration on day two.

Below, Laird facilitates a journey into the virtual world: The "Red Group" developing inputs for a workshop scenario. Participants had access to many resources including a series of posters shown hanging on the wall.

Values, Indicators & Management Controls

Values that people place on forest lands vary from person to person. To try and understand these diverse values better, LP conducted a census of public forest values by circulating a questionnaire. The results helped establish local level indicators to monitor the future forest as it develops. These results were summarized in the LP Swan Valley Newsletter Volume 2 Issue 3. Indicators help LP to evaluate how successful our management plan is at continuing to provide the values and benefits from the forest that are important to you in the future. Indicators used by LP planners report on the status of these values for different management scenarios. They can be used to report on forest conditions, or indicators can be used as targets for specific objectives. When an indicator is used to set objectives, or as a target, it is referred to as a management control. Some examples of indicators and management controls include the amount of deciduous wood available for harvest, harvest block sizes, or the amount of different forest types present on the forest (such as deciduous vs. coniferous, or old vs. young).

What is an Indicator?

Indicators are forest attributes that are measured to ensure agreement between planned objectives and what actually happens on the ground. Indicators should respond directly or indirectly to management actions and should be measurable. Indicators play an important role in the evaluation of scenarios and the selection of a set of management strategies that will ensure the values of the public, as well as the forest ecosystem, are maintained into the future. Results from the computer modeling are displayed in terms of the set of indicators LP is monitoring and reflects the effects of management decisions on the indicators.

What is a Scenario?

A scenario defines a proposed management strategy in terms of specific policies or practices. When forest modelers talk about scenarios, they refer to a complete plan of actions in the forest, and predict how the forest will respond to those actions. These responses (model results) show what is likely to happen if a certain management strategy is followed. Forest management scenarios are complex. The computer model is supported by science-based estimates of forest growth and development, including how the forest changes over time and the new forest regenerates. These scenarios enable LP to communicate ideas about possible future forest conditions to the public and the government, and to estimate the benefits and potential effects of each alternative approach relative to each other.

Workshop Scenarios

An introductory session of the Round 1 Workshop consisted of background presentations and the introduction of three draft scenarios to demonstrate the scenario planning process and the use of management controls and indicators.

Scenario A: the management controls used in this scenario reflect current practices in terms of harvest block size, percentage of watersheds that can be harvested, and harvest volumes (about 350,000 m^3 of hardwood each year and 200,000 m^3 of softwood). A modified clear cut harvest, which ensures that wildlife trees and patches are maintained within the harvested area, with natural regeneration, was the principle silviculture system.

Scenario B: this scenario included the management controls of Scenario A but increased planting, increased harvest block sizes, managed the forest so a continuous supply of harvestable trees is available, doubled the number of wildlife trees left within harvest blocks and employed understory protection and alternatives to modified clearcutting.

Scenario C: this scenario featured three zones of management, protected areas that exclude harvesting (20%), intensive areas (20%) that use current harvest practices described in Scenario A, and extensive areas (60%) that use management practices to promote biodiversity, similar to Scenario B.

The entire package of indicators and management controls defines a forest management scenario. Please see LP Newsletter Volume 3, Issue 1 for a discussion on scenario planning; the LP Swan Valley webpage also provides an excellent review of scenario planning, along with all of the Round 1 Workshop material: www.swanvalleyforest.ca/scenarioplanning/scenario_intro.html.

Analysis of Scenarios

The results of each simulation produced by the Patchworks computer simulation tool (see previous issue) consists of dozens of graphs and tables showing how indicators are expected to change as a result of management over time. The analysis found few differences between the 3 scenarios for most of the forest indicators including habitat supply predictions for 17 selected wildlife species. These indicators of forest condition enable planners to examine trends, evaluate the effects of management strategies and options, and compare scenarios. Many examples of the results for these draft scenarios were presented to the group at the workshop.

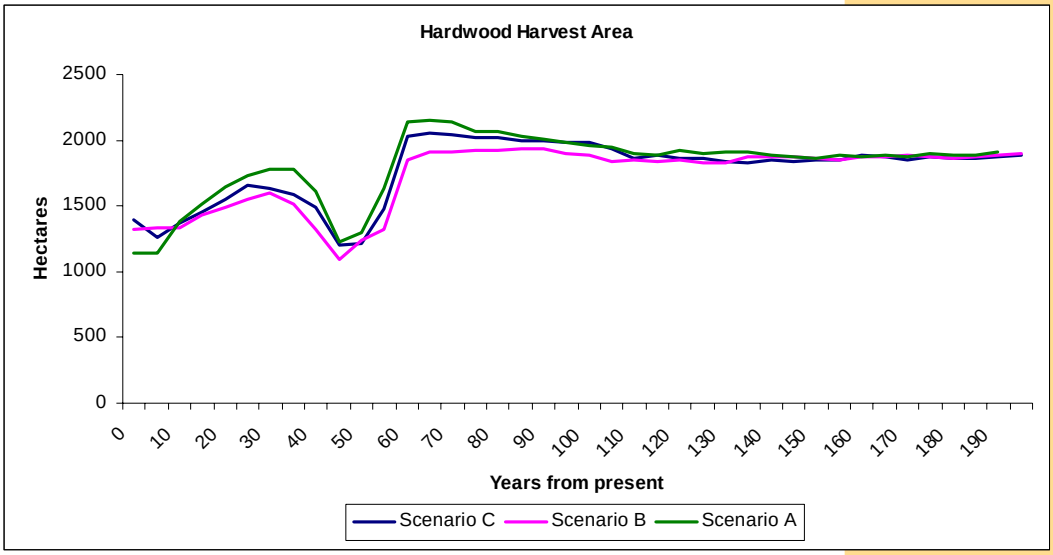


Figure 1: Predicted annual hardwood harvest area for Scenarios A, B and C.

Many of the scenario options and results of the analyses are influenced by the history of the Duck Mountains. Major fires occurred in the late 1800s and in the 1920s resulting from extended drought and human activity. For this reason, most of the forest today is 80 to 100 years old. LP and the Quota Holders harvest approximately 1% of the forest each year. Over time, in 50 or 60 years from now, the current forest (across the entire provincial forest) will change to one that has proportionately greater amounts of young forest than is present today.

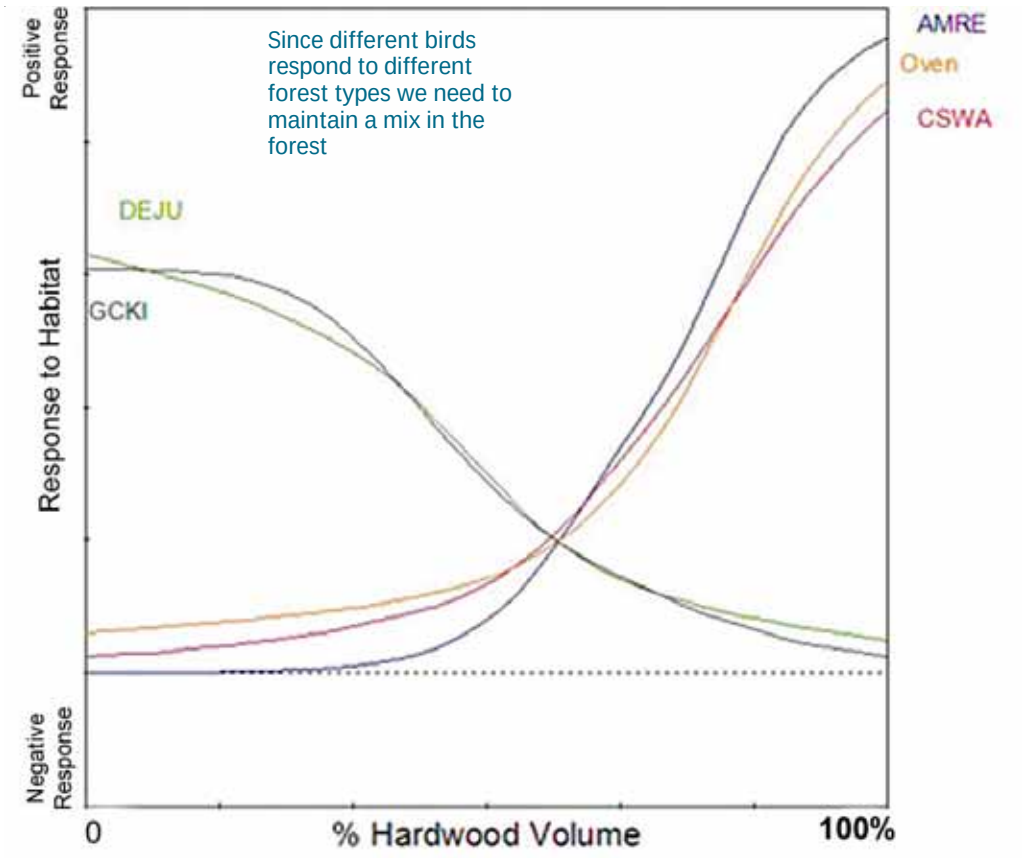
Figure 1, above, shows little differences between scenarios for the indicator hardwood harvest area. This trend was seen in all of the other indicators that were evaluated as a result of the simulations.

Analysis of Scenarios, continued...

The computer model results did not show strong differences between scenarios because the effects of the management controls, such as larger harvest blocks and retention of wildlife habitat within blocks, are relatively small. The seral class targets (seral class refers to the age of different types of forest) were easy to achieve in all scenarios due to the size and shape of the parks and protected areas. The forest within all three scenarios changes from an older forest to a younger forest over a 50 year period (see page 7). This would also occur naturally, even without harvesting, as old stands age and are replaced by younger stands over time (through natural forest growth and development, or as influenced by natural disturbances such as fire or blow down). Similarly, some indicators for biodiversity increase over time while others decrease, yet overall biodiversity (both plant and animal) remains well represented across the landscape. The figures on page 6 illustrate how a higher harvest rate (left) creates more young forest sooner than a slow harvest rate (right).

Additional analysis of potential future forest conditions resulting from the Patchworks simulations also found few differences between scenarios. Since the conservation of biodiversity is an important aspect of sustainable forest management, LP wanted to assess the ability of each of the scenarios to provide biodiversity in the future. A unique biodiversity assessment tool was developed using the bird data collected by LP in the Duck Mountains over the last 10 years. This tool, called the Spatial Landscape Assessment Model, assesses the availability of bird habitat in the future forest based on LP's management scenarios. Bird species, because of the different types of habitat they use, and their easily identifiable calls, make useful biodiversity indicators.

Figure 2 (below): Graphical depiction of how different bird species respond to different habitat. DEJU is Dark-eyed Junco, GCKI - Golden Crowned Kinglet, CSWA - Chestnut-sided Warbler, Oven - Ovenbird, AMRE - American Redstart.



American Redstarts like lots of hardwood

Ovenbirds also prefer hardwoods

Golden Crowned Kinglets don't like large amounts of hardwood

Figure 2 (previous page) illustrates how different bird species to different habitats, as reflected by the amount of hardwood in the stand. In this case, we see how American Redstarts respond positively to the high percentage of hardwood trees (aspen) whereas Golden Crowned Kinglets respond negatively to large amounts of hardwood.

Another external assessment tool used to evaluate the effects of different management scenarios on the aquatic systems of the forest is called WRENss. WRENss stands for Water Resource Evaluation Non-point sources model. It assesses the potential for changes to annual water yield in streams and rivers draining the Duck Mountains as a result of LPs forest management practices. The analysis, conducted at several different scales (ie. analysis included considerations for watersheds of different sizes – Figure 3) showed small differences between scenarios. Some watersheds had higher water yield increases than others but all were within acceptable ranges according to hydrologist Dr. Richard Rothwell. It is important to note that natural variation in peak flow and water yield occurs in forested systems due to changes in precipitation amounts and timing of events from year to year. WRENss analysis assists LP in predicting the effects forest management activities may have on water yield so that potential negative effects can be minimized.

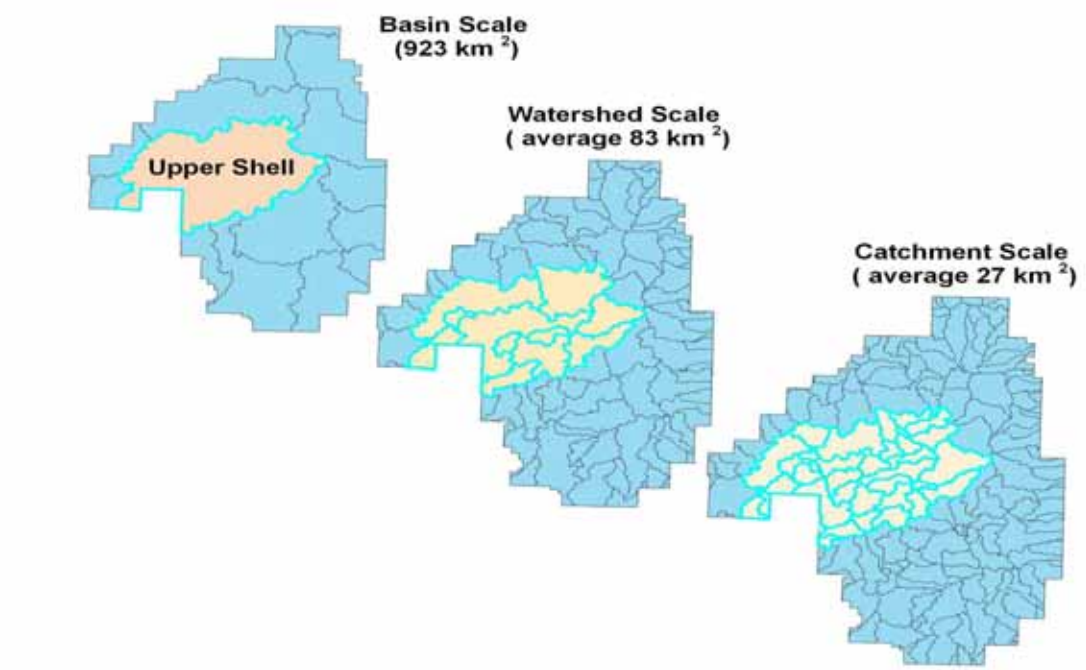


Figure 3: Basin, watershed and catchment scales for water yield analysis. Catchments are the smallest size unit for analysis, which are nested within the watershed scale (medium level) contained within the Upper Shell Basin (largest analysis unit).

Results of Sensitivity Tests

A sensitivity test is an analysis method that examines the relative change in results based on small changes in targets or strategies that are put into the model. Sensitivity Analysis offers a way to test the risks or potential variations in results associated with the change in targets or strategies. For example, analysis has been completed on “rate of harvest”. To conduct this analysis, each scenario was tested at reduced and increased harvest levels over the long term to test sustainability under these different levels of harvest.

If the rate of harvest is high, some species’ habitat may be reduced, while others increase. On the other hand, if the harvest rate is low, social and economic benefits are impacted. Forest management is all about finding acceptable trade offs among many values, which sometimes conflict. It is impossible to manage for all values in all places, so we try to find the best way to balance management activities to provide multiple benefits (including hunting, recreation, water quality, logging, etc.) where there is potential to do so.

Results of Sensitivity Tests, continued...

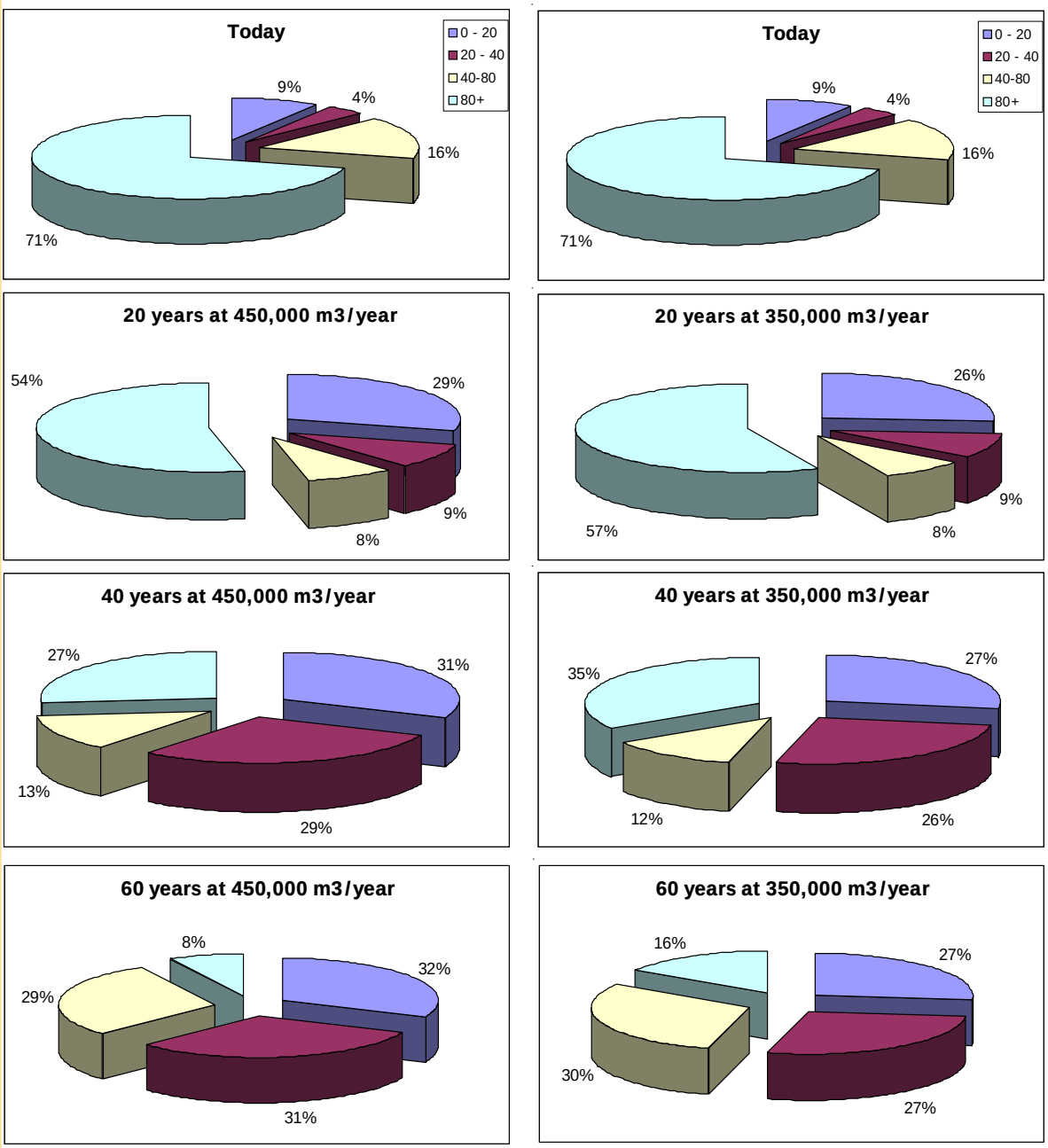
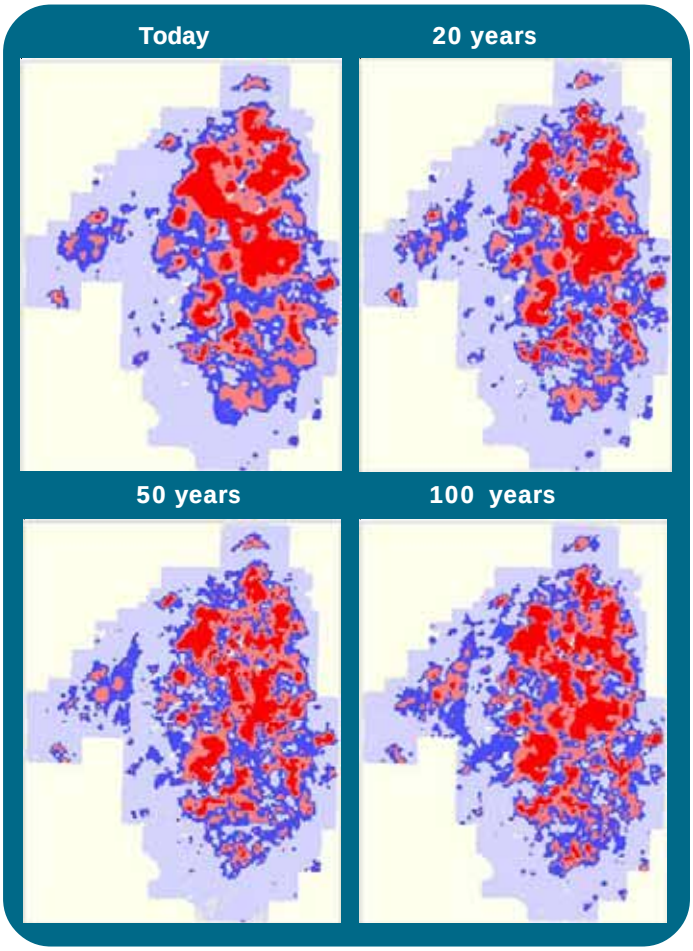


Figure 4: Projected changes in the age categories of the forest under different levels of harvest - on the left harvest levels are at 450,000 m^3 per year; on the right, harvest levels were set at 350,000 m^3 per year. This shows that a higher harvest rate converts the relatively old forest to a relatively young forest faster than the slower rate of harvest. Note that this area does not include parks, which tend to maintain older forest.

Bird Habitat as an Indicator

Figures 5 and 6 demonstrate how the availability of Ovenbird and Golden Crowned Kinglet habitat changes over time based on the Scenario B example. In the figures below, the red areas of the Duck Mountain maps indicate where there is a high probability of finding high densities of Ovenbirds (Figure 5) and Golden Crowned Kinglets (Figure 6). Ovenbirds prefer aspen in older, contiguous forest whereas the Golden Crowned Kinglet prefers older forest in spruce and mixedwood ecosites. For this reason Ovenbird habitat improves as aspen dominated areas tend to grow older and create taller trees with a more closed canopy. Ovenbird habitat becomes strongly associated with the Park and reserve areas 50 years from now, since these areas are not harvested and continue to age into older contiguous forest habitat with taller, older trees. These scenarios show how important parks and reserve areas can be for some species.

Figure 5 (right): Ovenbird Habitat. Present conditions show a strong affinity to mature forest in the aspen dominated ring around the Duck Mountains. This species does well in mature aspen dominated forest, so as time progresses, and mature aspen forest spreads throughout the Duck Mountains, the species spreads to interior areas particularly in the park areas, where mature aspen is prevalent.



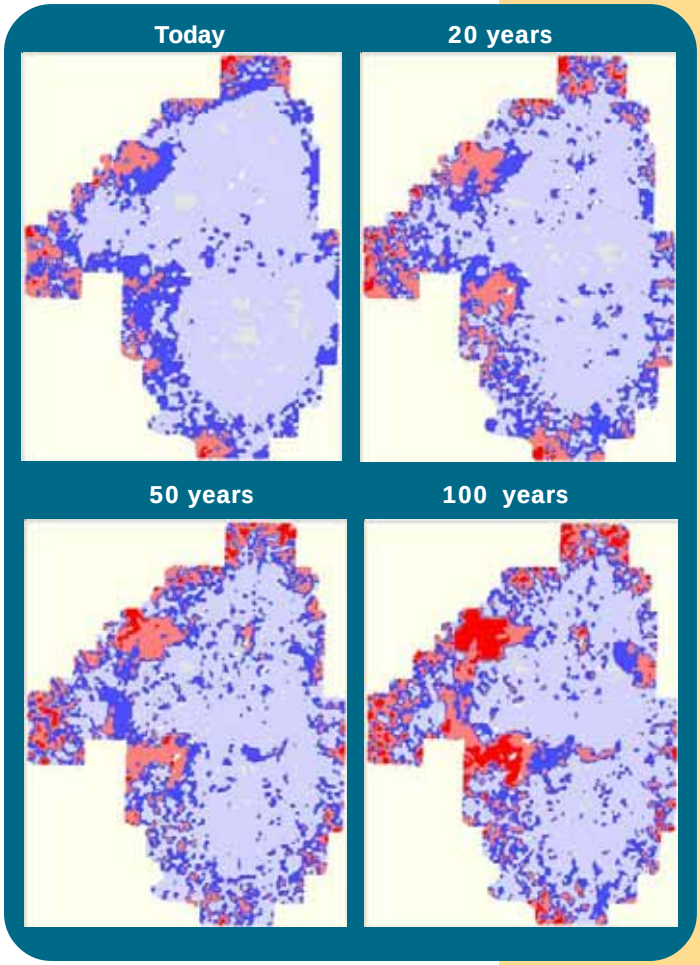


Figure 6 (left): Golden Crowned Kinglet Habitat. These birds do well in mature forest areas dominated by spruce and other conifer mixedwoods. These Kinglets also have some affinity to areas with old growth characteristics such as decaying trees (snags). Ecosite-types do not change rapidly over time, so this species tends to be more stable in its distribution than Ovenbird, which relates more directly to aspen age and height.

Participant Input

At the Round 1 workshop, an afternoon breakout session was organized to discuss specific indicators and associated forest values that participants were interested in. Among the proposed indicators and values discussed were: the maintenance of current levels of biodiversity, water quality and riparian management issues, job opportunities, and the effects of different block arrangements and sizes. Participants were also asked to suggest other indicators of interest that could be included in the analysis. Several indicators were discussed, including road densities, due to the related effects of new access on moose and elk hunting and long term populations. Road density will be included in future analyses and discussed further at the next stakeholder workshop.

The graph below shows results from Patchworks analysis of road densities. Planners ran the model overnight and presented these results on the following day. Figure 7 below shows total active road length over time. The road length metric does not apply to a small area, but to the Duck Mountains as a whole.

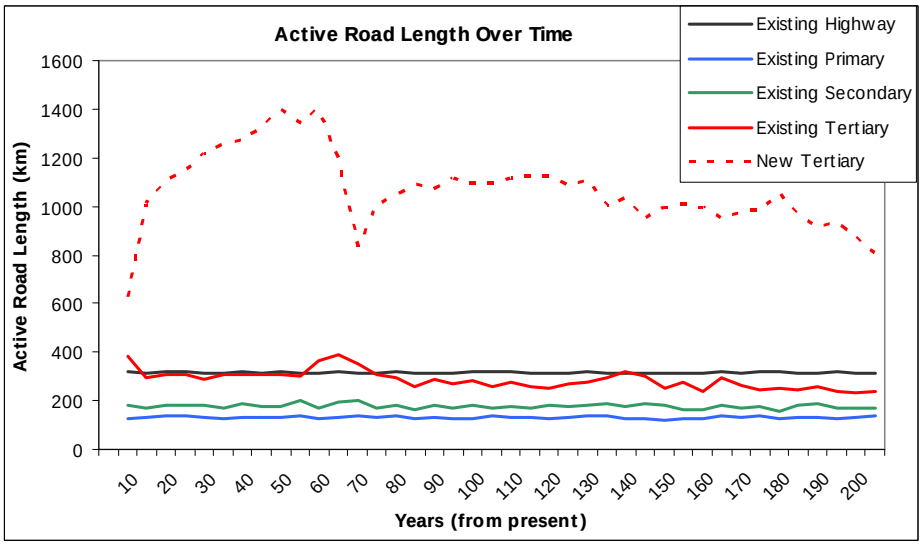


Figure 7: Active road length over time. Note that this projection does not consider the loss of roads through decommissioning and natural abandonment, which will reduce the amount of existing tertiary roads on the landscape as new roads are built, thereby maintaining an approximately constant area in tertiary roads over the planning period.

Other analysis suggests that larger harvest blocks enable lower road densities in the future, and that volumes and current levels of biodiversity can be maintained over a range of harvest block sizes.

A complete package of material about the Round 1 Scenario Planning Workshop, including the posters, has been made available to the public for review and downloading on our website at

http://www.swanvalleyforest.ca/scenarioplanning/Round1.html

Another benefit of the workshop was the opportunity for participants to ask specific questions of LP and their plan advisors. Some questions dealt with current LP operations and government policy, others related to general ideas about future analysis and plans, and some were very specific questions about outcomes or concerns related to specific components of forest management. Many of these questions were answered during the workshop, although some questions will be answered when the analysis is complete.

LP planners will continue to refine the management scenarios with information from this and other workshops, continue the scenario analysis with assistance from various computer models, and will bring more information to the second round workshop and public open houses in the fall of 2005. As always, LP welcomes your questions or concerns about current and future operations and plans. You can direct your questions to LP by mail, phone, fax or email.

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