

### Playing With Fire

Wildfires are enigmatic because they are beneficial to some values and threatening to others. The problem for operational planning is that the size, location, and severity of wildfires are not predictable. The best we can do is define probabilities of burning over time. Accordingly, we generated an historical burn probability table for the Hwy40 study area. For example, over the next 20 years, there is a 50% chance that at least 13,800 of the 70,000 ha would burn (in bold blue in the upper table) *under the historic fire regime scenario*.

#### Historical Probabilities of Burning in the Hwy40 Area

Probability	Minimum Number of Hectares Burnt		
	In 10 Years	In 20 Years	In 40 Years
90% chance	>180	>2,800	>10,800
75% chance	>1,100	>6,900	>19,900
50% chance	>4,500	<b>&gt;13,800</b>	>29,600
25% chance	>10,100	>20,700	>37,700
10% chance	>14,500	>24,900	>46,900

Estimating the current risk of burning is more useful, but also more difficult because human-caused ignitions *increase* fire risk, while fire control efforts *decrease* fire risk. Substantial evidence suggests that wildfire risk on current forest landscapes is lower overall than it was historically, but by how much is debatable. For the Hwy40 area we adopted a conservative estimate of reducing the area by a factor of 2 ½. Thus, over the next 20 years, there is a 50% chance of at least 5,500 ha burning under the existing scenario (bold blue in the lower table).

#### Current (Est.) Probabilities of Burning in the Hwy40 Area

Probability	Minimum Number of Hectares Burnt		
	In 10 Years	In 20 Years	In 40 Years
90% chance	>70	>1,100	>4,300
75% chance	>400	>2,800	>8,000
50% chance	>1,800	<b>&gt;5,500</b>	>11,800
25% chance	>4,000	>8,300	>15,100
10% chance	>5,800	>10,000	>19,000

Quantifying the risk of natural disturbance has facilitated the development of the Hwy40 plan in several ways. First it is an excellent way to communicate the relevance of reducing the risk of wildfire as a planning objective, and it provides some realistic expectations. For example, eliminating the chance of wildfire on forested landscapes is clearly not possible. However, it would be a considerable accomplishment if we could shift the probabilities just a single level in the adjacent table by strategically locating and

sizing disturbance events, and applying other fuel-modification tactics. Thus, a 50% chance of at least 5,500 ha burning in the next 20 years becomes only a 25% chance after the plan has been executed.

Quantifying fire risk is also a key ingredient for responsible operational planning. Regardless of whether we consider fire as a positive or negative influence, one must acknowledge that future wildfire impacts, somewhere, and to some degree, are a fact – forest fires *will* happen. Knowing this, how will they be managed such that they are consistent with strategic objectives? No one denies this is a landscape with high values, thus it may warrant unique ways of dealing with wildfire events after they occur.

Facing the reality of the risk of wildfires also inevitably leads one to adopting a broader view of sustainability. Despite our best efforts to presume and act otherwise, landscapes in this part of the world cannot be maintained in a static condition providing stable sources of habitat for individual species, wood fibre, or recreational opportunities. For instance, it may be possible to mitigate, but ultimately not prevent, the abandonment of the Hwy40 area by woodland caribou since wildfire is an unavoidable phenomenon, and caribou prefer older forest. All one can do in an operational plan is to try to maintain the high-priority values long enough - within the limits of higher-level plans - for other areas to shoulder similar responsibilities.

In the end, the quantification of wildfire risk within the Hwy40 plan can only help us make more informed and thus more responsible operational planning decisions.

For more information on the Hwy40 North Demonstration project, please contact: Dr. David Andison, Bandaloop Landscape Ecosystem Services, Tel.: (604) 939 – 0830, Email: [andison@bandaloop.ca](mailto:andison@bandaloop.ca), or visit [www.fmf.ab.ca](http://www.fmf.ab.ca)