

**2010 Eastern Spruce Budworm Overwintering Populations
and 2011 Defoliation Forecast for the “Built up” Area of the
Town of Waskesiu, Prince Albert National Park,
Saskatchewan**

Prepared for

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Introduction

Eastern spruce budworm (SBW) (*Choristoneura fumiferana* Clem.) has been a prominent forest defoliator in Saskatchewan over the last 15 years. From the early 1980s to 1997, moderate to severe defoliation caused by SBW was usually less than 100,000 ha (Figure 1). The total area of defoliation climbed to 669,000 ha of moderate to severe defoliation in 2002, at the peak of the current outbreak. Since 2002, the area defoliated by SBW has steadily decreased, due mostly to declining populations in Lac La Ronge Provincial Park, Prince Albert National Park (PANP) and northeastern Saskatchewan in the Deschambault and Amisk Lakes area. In 2010, the amount of moderate and severe defoliation totaled 85,466 ha.

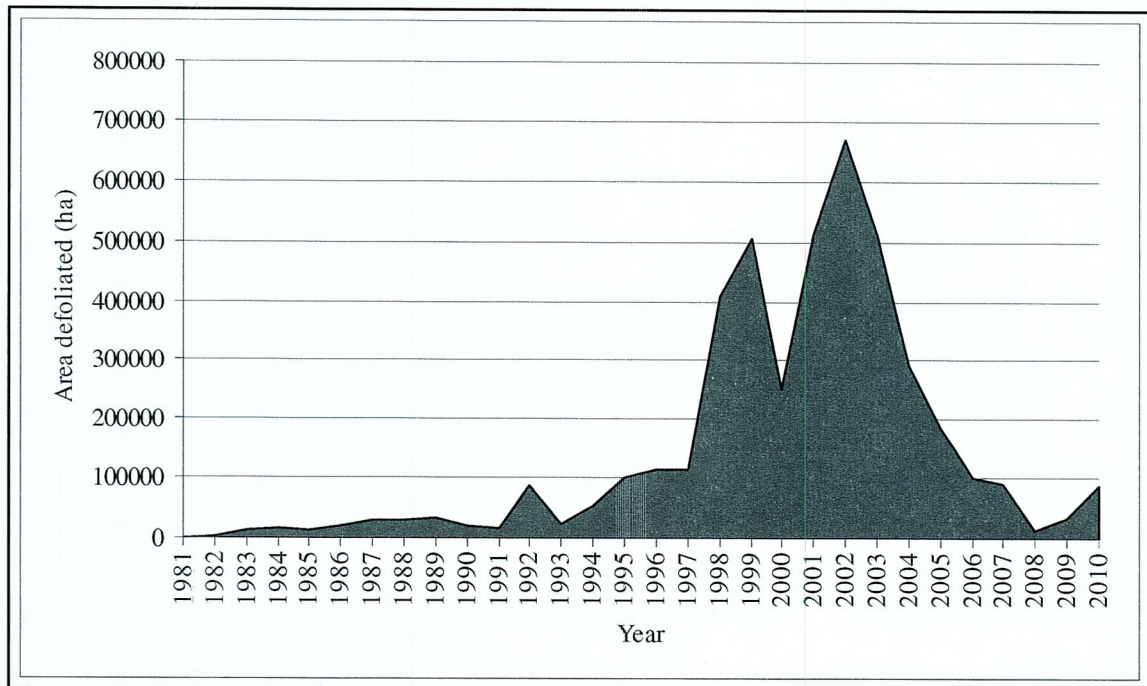


Figure 1. Area of moderate to severe defoliation caused by the eastern spruce budworm in Saskatchewan from 1981 to 2010.

In 2010, Waskesiu Seasonal Residents Association Inc. contracted BioForest Technologies Inc. (BioForest) to perform a SBW overwintering second instar larval (L_2) survey to estimate SBW populations and forecast defoliation for 2011 in the “built up” area of the Town of Waskesiu Lake. This report summarizes the results of the 2010 L_2 survey and presents the 2011 defoliation forecasts.

Methods

White spruce branch sampling was conducted by two experienced BioForest staff on January 25th 2011, at two locations in proximity to white spruce health plots 9 and 10 as monitored and reported by Parks Canada in their update to Waskesiu Community

Counsel, October 25th, 2010. The sample locations were selected at random but an effort was made to distribute the sample locations to provide an estimate of SBW populations throughout the “built up” area of the Town of Waskesiu Lake.

At each location, a mid-crown branch-tip measuring 45 cm was collected from each of six, randomly selected, co-dominant white spruce trees, to determine the density of overwintering budworm larvae (L_2 's per 10 m² of foliage). Each branch was rated for current (2010) host shoot defoliation and measured for width. The branches were cut into medium size pieces and placed in labeled paper bags. The paper bags were put into a breathable burlap sac and the burlap sac was closed with a piece of flagging tape that was labelled with the plot number or name. The samples were transported to the Great Lakes Forest Centre in Sault Ste. Marie, Ontario, where BioForest conducted larval extractions using a sodium hydroxide (NaOH) washing method.

The number of overwintering L_2 's per branch was recorded and the density of L_2 's per 10 m² of foliage was calculated. An average L_2 's per 10 m² of foliage was calculated for each location. A 2011 defoliation forecast of light, moderate, or severe was assigned to each of the locations sampled. A light (<35%) defoliation forecast is predicted when there are <189 $L_2/10m^2$ of foliage. A moderate (35%-70%) defoliation forecast is assigned when there are 189-540 $L_2/10m^2$ of foliage. A severe (>70%) defoliation forecast is predicted when there are >540 $L_2/10m^2$ of foliage.

Results

Laboratory L_2 extraction results indicate that, in 2011, severe defoliation will occur at both of the locations sampled (Table 1).

Plot #	BRANCH NUMBER - SBW $L_2/10m^2$						SBW $L_2/10m^2$			Avg. 2010 Defoliation	2011 Defoliation Forecast
	1	2	3	4	5	6	Min.	Max.	Avg.		
WSHP-09	10686	618	2483	7040	2717	2751	618	10686	4343	64	Severe
WSHP-10	1010	3652	1112	1872	1796	1072	1010	3652	1752	76	Severe

Table 1. 2010 average defoliation and 2011 defoliation forecast for each sample location in the “built up” area of the Town of Waskesiu Lake.

Discussion

Assuming there is not an unforeseen weather event such as a late spring frost or snowfall that causes premature larval mortality severe defoliation of white spruce trees will occur in the “built up” area of the Town of Waskesiu. As a result of a severe defoliation event white spruce tree health will decline. In addition and depending on SBW populations on a given tree there is a possibility that SBW feeding will result in white spruce sustaining bare tops.

It is also possible that SBW populations in the “built up” area will expand to other areas of the Townsite in 2011, however the level of expansion cannot be determined at this time.

Recommendation

BioForest recommends that annual SBW L₂ sampling be conducted in the “built” up and “peripheral” areas of the Town of Waskesiu to monitor SBW populations annually. This is particularly important as SBW populations continue to persist elsewhere in PANP and there is a probability that the Townsite will be re-infested as a result of a moth flight(s) from surrounding infested forests.