

Insects and Disease

Introduction

Monitoring for insect and disease conditions on the Superior National Forest (SNF) is critical to anticipating and mitigating insect and disease outbreaks. Assessing insect and disease infestations and trends is a multi-agency effort due to the extensive mixed ownership in northeastern Minnesota. For the past fifteen years, monitoring has been a collaborative effort between the Minnesota Department of Natural Resources (MN DNR) Forest Health and Resource Assessment Units and the Forest Service, State and Private Forestry division.

Monitoring Question

To what extent is Forest management managing undesirable occurrences of fire, insect, and disease outbreaks?

[Forest Plan direction](#) for Insect and Disease are identified in the CFR and the Forest-wide Management Direction. 36 CFR 219.12 (k)(5)(iv). Destructive insects and disease organisms do not increase to potentially damaging levels following management activities. O-ID-1. Increase the amount of forest restored to or maintained in a healthy condition to reduce risk and damage from fires, insects and diseases. D-ID-2. Integrated pest management approaches are used to avoid epidemics and infestation of undesirable native or non-native invasive species.

The monitoring question and associated forest plan direction were selected because monitoring for Insect and Disease is a requirement of the Forest Plan. Monitoring for insect and disease conditions on the Forest is critical to anticipating and mitigating insect and disease outbreaks.

The units of measure chosen were: (1) Acres of SNF inventoried for insect and disease and (2) Acres of SNF insect and disease populations treated. The units of comparison include (1) Existing populations contained and (2) new infestations reduced or eliminated.

These units of measure and comparison were selected because they allow us to make a direct comparison to forest plan direction and enable us to monitor and assess the achievement of forest plan objectives over time.

Monitoring Methods

Methods include annual aerial surveys, trapping (gypsy moth and emerald ash borer), and public education. Results are generally available in the fall.

Results and Implications

Spruce Budworm

Spruce budworm, a native insect, continues to defoliate fir and spruce in northeastern Minnesota. Spruce budworm infestations have been continuously mapped since 1954. Over this 55-year period, an annual average of 220,000 acres of defoliation has occurred across all ownerships. Multi-storied stands of balsam fir and white and black spruce, which are favored by spruce budworm, are widespread across the SNF.

While remaining relatively static between 2001 and 2005, a significant increase was observed in 2006 and continued in 2007 with infestations on the SNF concentrated in central St. Louis County on the Laurentian and LaCroix Ranger Districts (Figure 4.1). The acres defoliated during 2009 was approximately 60,700 acres, an increase of 32% over the 41,200 acres of new defoliation in 2008. The acres defoliated during 2009 were noted across all ownerships, but noticeably centered in the upper central portion of St. Louis County. Within the SNF, an estimated 5 percent of the 2009 infestation occurred inside the Boundary Waters Canoe Area Wilderness (BWCAW).

Direct treatment of spruce budworm infestation continues to be limited due to the presence of the insect in mixed ownership patterns and within the BWCAW. The SNF is proactive, however, in treating current vegetation to lessen its future susceptibility to spruce budworm.

Gypsy Moth

Gypsy moth, an invasive insect, catch levels increased in 2008 with most of the activity occurring along the North Shore (Gunflint and Tofte Ranger Districts). Figure 4.2 shows the trapping intensities by county. Since 2004, trap catches have increased by 15x to 50x in Cook and Lake counties.

During 2009 approximately 71,000 acres, of which 8,500 occurred on SNF land, were treated near Lake Superior with pheromone flakes. In addition, approximately 700 acres of non-SNF lands in northeastern and southeastern Minnesota were treated with a biological control bacteria *Bacillus thuringiensis* (Btk). While follow-up surveys were planned in 2009, conclusive results will not be known for one to two years after the treatments. No egg masses were present along the North Shore as of 2009.

Larch beetle

These insects attack tamarack trees. The 2002-2003 and 2006-2007 droughts may have been a factor in weakening the trees and making them susceptible to attack.

Emerald Ash Borer

This insect was recently found in St Paul and is near the state border in far southeast Minnesota. The mortality rate of an infested tree is 100 percent. Approximately 19,000 acres of the SNF contain black and green ash, particularly in the western portion. The SNF has cooperated with the MN DNR and State Department of Agriculture with an educational program.

Figure 4.1. Infestation centers of spruce budworm in northeastern Minnesota.

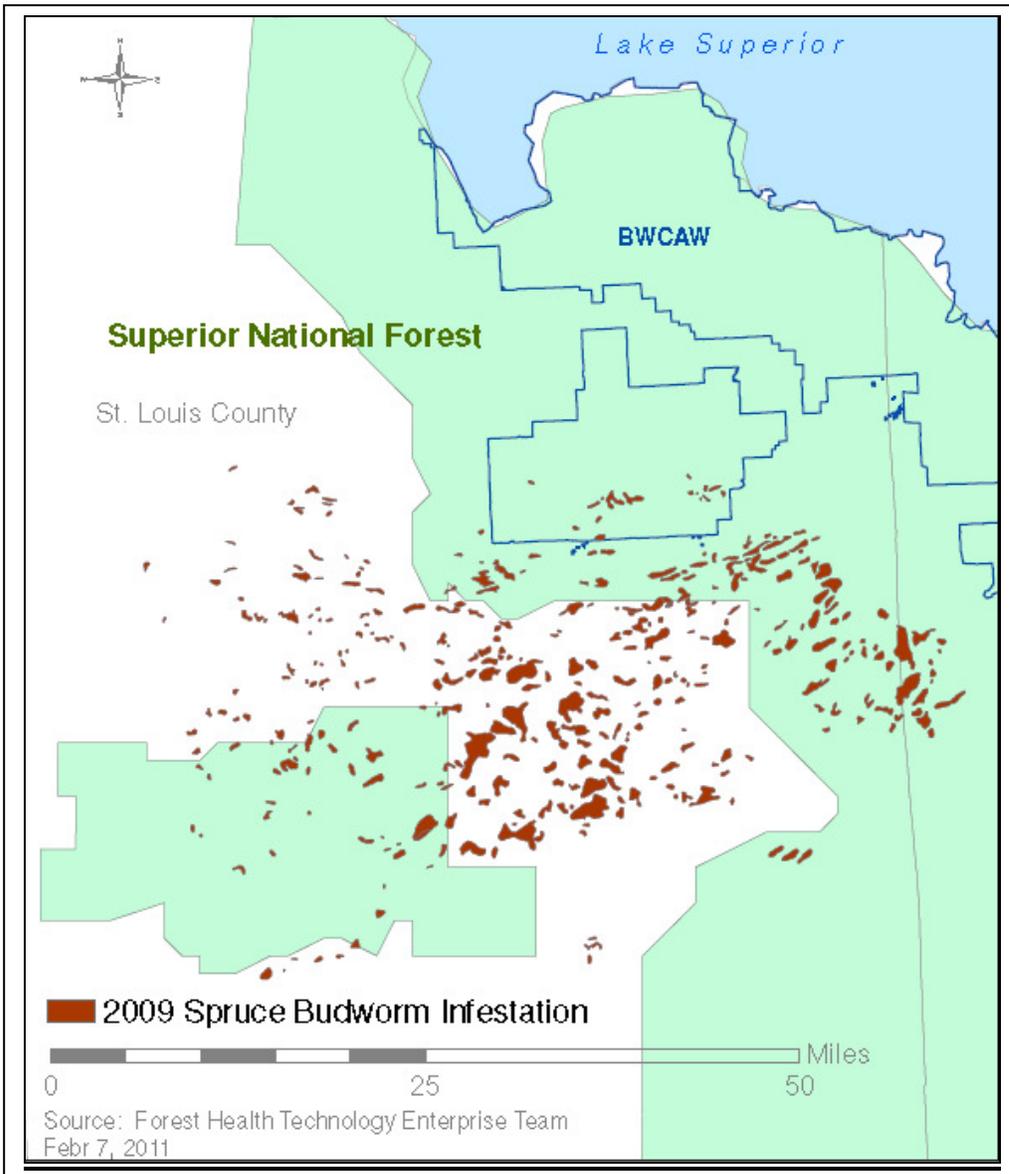


Figure 4.2 Minnesota's North Shore Gypsy Moth 2008 survey.

