

2015 Swiss Needle Cast Aerial Survey

Alan Kanaskie and Danny Norlander

Oregon Department of Forestry

July 31, 2015

Survey procedures:

The observation plane flew at 1,500 to 2,000 feet above the terrain, following north-south lines separated by 2 miles. Observers looked for areas of Douglas-fir forest with obvious yellow to yellow-brown foliage, a symptom of Swiss needle cast (SNC). Patches of forest with these symptoms (patches are referred to as polygons) were sketched onto computer touch-screens displaying topographic maps or ortho-photos and the position of the aircraft. Each polygon was classified for degree of discoloration as either "S" (severe) or "M" (moderate). Polygons classified as "S" had very sparse crowns and brownish foliage, while those classified as "M" were predominantly yellow to yellow-brown foliage with slightly denser crowns than those classified as "S". The survey area extended from the Columbia River in Oregon south to the California border, and from the coastline eastward until obvious symptoms were no longer visible. We also surveyed a portion of the west slope of the Cascade Range in 2015, from Lane County north through Clackamas County.

Results:

The survey was flown on May 18, 20, 27, 28, 29 and June 3 & 4, 2015, and covered 3,692,653 acres in the Coast Range and 638,000 acres in the Cascade Range (figure 1). Bud break was earlier than normal because of unusually warm weather, but the survey was delayed until much later than planned because of technical and administrative difficulties related to the aircraft. Despite this, symptoms remained visible to observers well after bud-break and into June. The delay may have been fortuitous because symptom development earlier in the year was poor, probably related to the unusually mild weather of early 2015 (although we don't understand the relationship).

The survey showed an increase in the area of forest with symptoms of Swiss needle cast compared to the previous 5 years, reaching an all-time high for the sixth year in a row. In the Coast Range we mapped 589,851 acres of Douglas-fir forest with obvious symptoms of Swiss needle cast (figure 2). As has been the case for the past several years, the easternmost area with obvious SNC symptoms was approximately 28 miles inland from the coast in the Highway 20 corridor, but most of the area with symptoms occurred within 18 miles of the coast. Figures 3 and 4 show the trend in damage from 1996 through 2015.

In 2015, as in 2014, we extended the survey south through Curry County to the California border even though few symptoms typically are observed south of Port Orford in northern Curry County. In Curry County we mapped only 80 polygons representing 4,319 acres with symptoms, most of them in the Port-Orford area.

In the partial survey of the Cascades Range (Lane, Linn, Marion, and Clackamas Counties), we mapped 3,186 acres with moderate Swiss needle cast symptoms. Limited ground truthing suggested that in some cases the symptoms may have been caused by something other than SNC.

The Swiss needle cast aerial survey provides a conservative estimate of damage because observers can map only those areas where disease symptoms have developed enough to be visible from the air. We know Swiss needle cast occurs throughout the survey area, but discoloration often is not severe enough to enable aerial detection. The total area of forest affected by Swiss needle cast is far greater than indicated by the aerial survey. The aerial survey does, however, provide a reasonable depiction of the extent of moderate and severe damage, and coarsely documents trends in damage over time.

Acknowledgements:

The survey was conducted by the Oregon Department of Forestry Forest Health and Air Operations sections, and was funded by the Oregon State University Swiss Needle Cast Cooperative, the USDA Forest Service Forest, and the Oregon Department of Forestry. Steve Larsen (ODF) and Dan McCarron piloted the plane. Danny Norlander (ODF) is the survey coordinator and primary observer. Other aerial observers were Bob Schroeter (USFS Region 6 FHP), Zack Heath (USFS), Wyatt Williams (ODF) and Christine Buhl (ODF).

Additional Notes:

We appreciate any information regarding the accuracy or usefulness of the maps. If you have a chance to look at some of the mapped areas on the ground, please let us know what you observe. Please call Alan Kanaskie (503-945-7397) or Danny Norlander (503-945-7395) if you have questions, suggestions, or comments.

The GIS data and a .pdf file can be accessed via the ODF web page at:

<http://www.oregon.gov/ODF/privateforests/fhMaps.shtml>

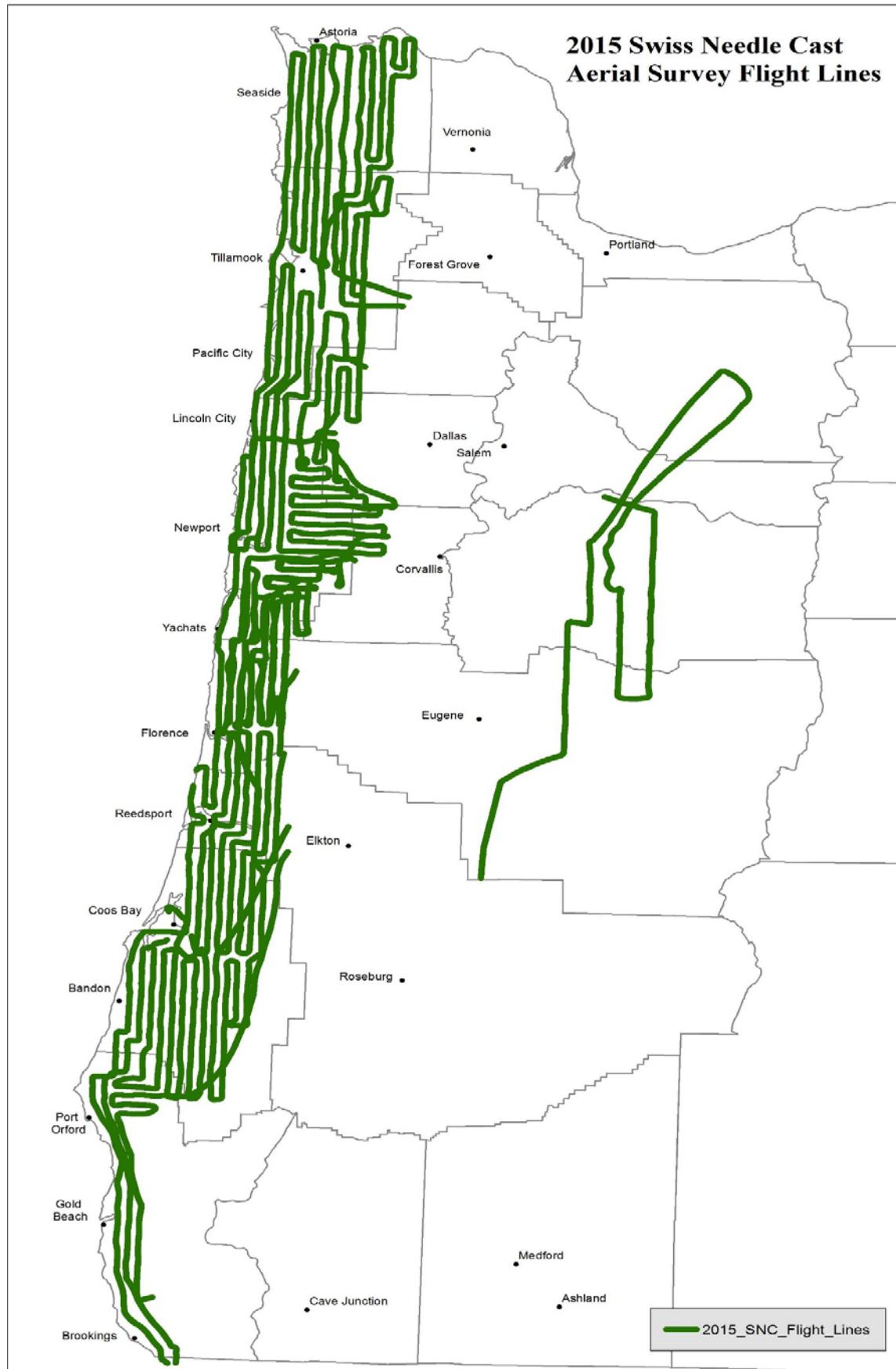


Figure 1. Area surveyed for Swiss needle cast symptoms, 2015. Flight lines are two miles apart.

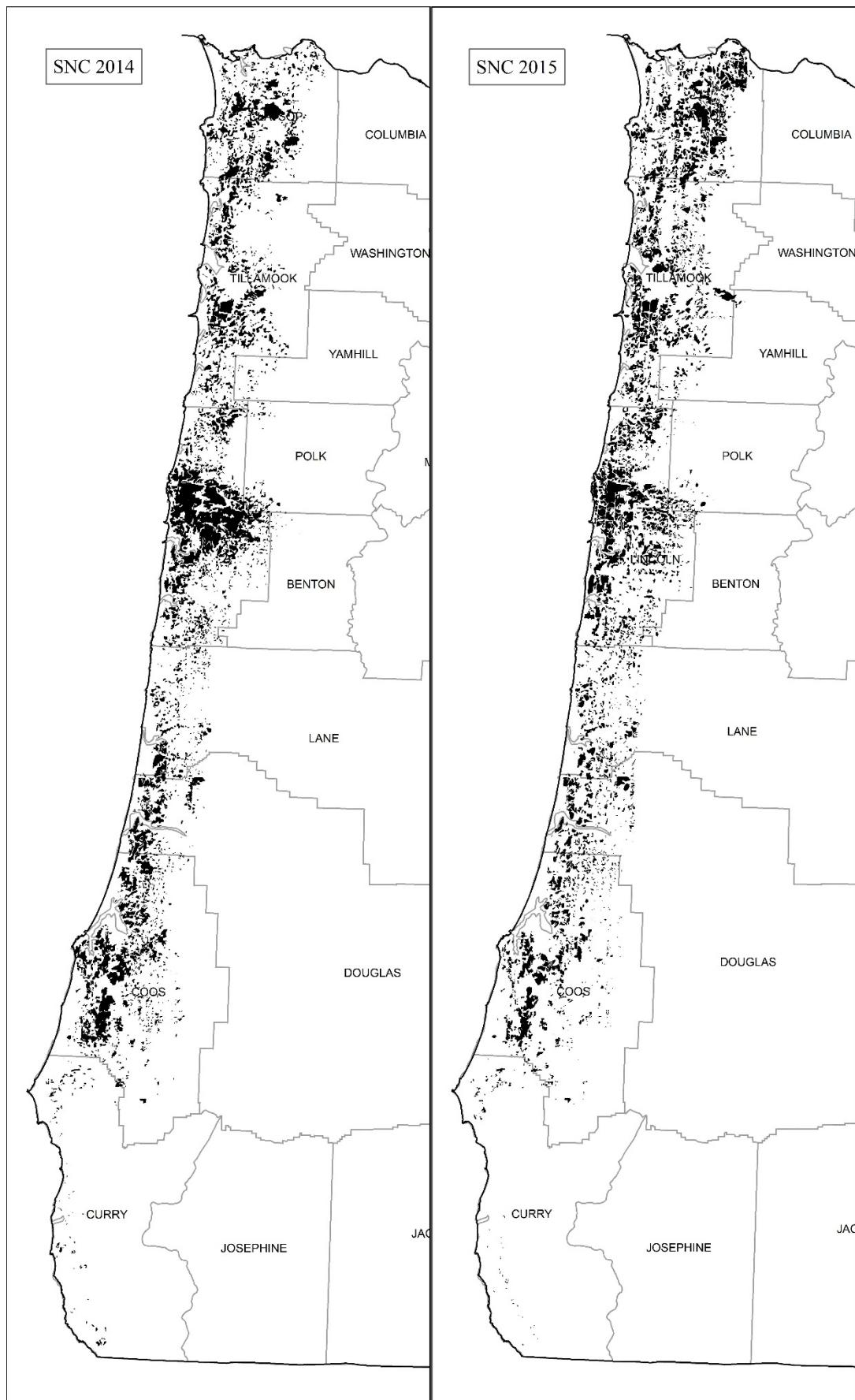


Figure 2. Areas of Douglas-fir forest with symptoms of Swiss Needle Cast detected in the 2014 and 2015 aerial surveys, Coast Range, Oregon.

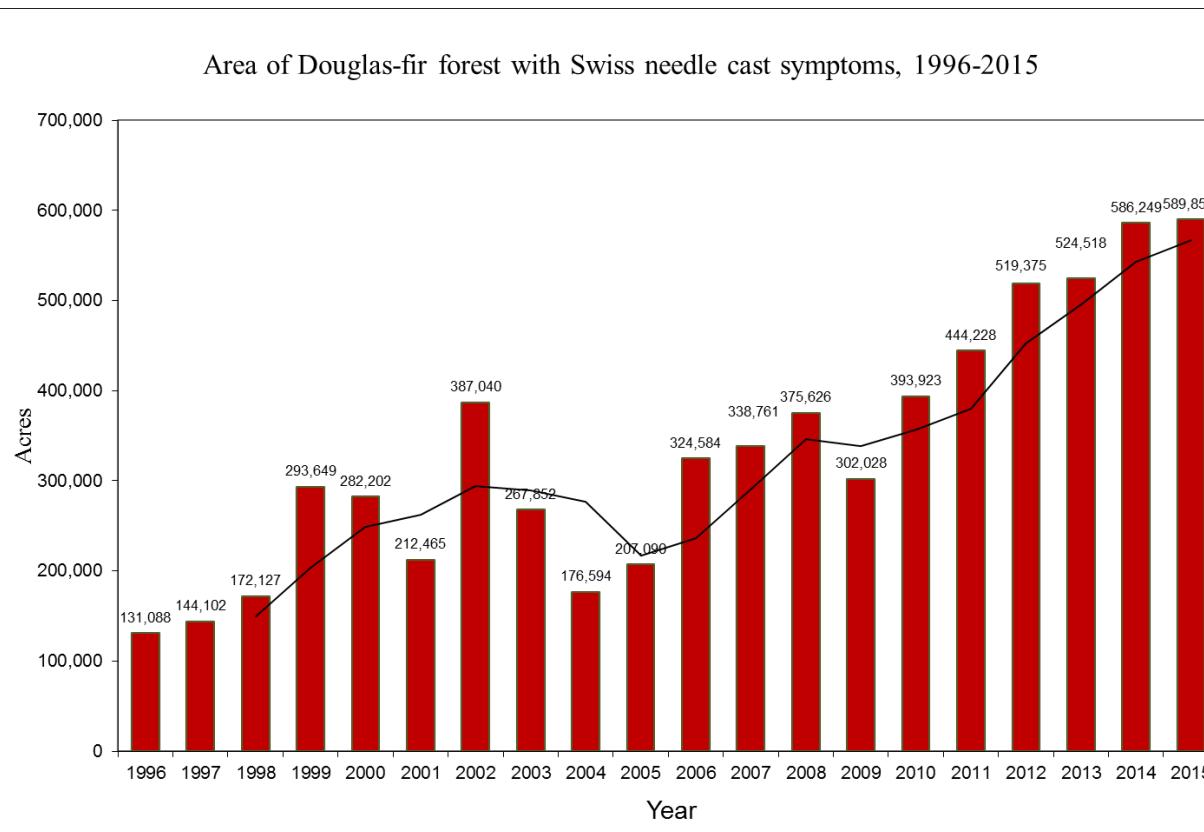


Figure 3. Area of Douglas-fir forest in western Oregon with symptoms of Swiss needle cast detected during aerial surveys conducted in April-June, 1996-2015 (2008 area estimated from partial survey consisting of 3 sample blocks). Coast Range, Oregon

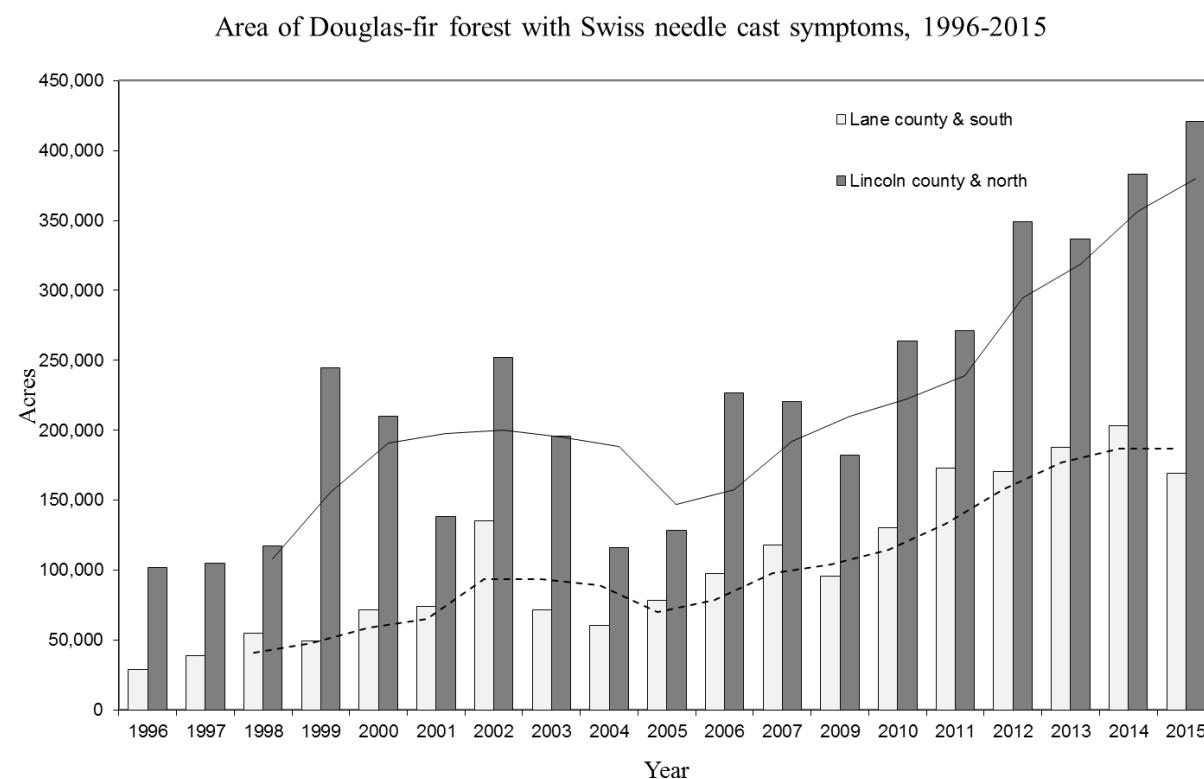


Figure 4. Area of Douglas-fir forest in western Oregon with symptoms of Swiss needle cast detected during aerial surveys conducted in April-June, 1996-2015; north and south halves of survey area (2008 area estimated from partial survey consisting of 3 sample blocks). Coast Range, Oregon.