

2014 Swiss Needle Cast Aerial Survey

Alan Kanaskie and Danny Norlander,

Oregon Department of Forestry

July 23, 2014

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. 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 middle of Humboldt County, California, and from the coastline eastward until obvious symptoms were no longer visible. We did not survey the Cascade Range in 2014, but Swiss needle cast does occur at damaging levels in some areas.

In Curry County we ground-checked a random sample of 14 polygons. Each polygon was given a plantation-level score for discoloration (1 to 4; 1 = normal green, 4 = severe yellowing) and SNC disease severity (1 to 6; 1 = healthy, 6 = severe SNC damage). A 250 foot transect was established in a representative part of each stand and 10 trees were evaluated for mid-crown foliage retention.

Results:

The survey was flown on April 29, 30, and May 1, 7, 12, 13, 14. Weather conditions and symptom development both were excellent during the survey period. The survey covered a total of 4,543,908 acres; 3,765,590 in Oregon and 778,318 in California (figure 1).

For Oregon, the 2014 survey results show an increase in the area of forest with symptoms of Swiss needle cast compared to the previous 3 years and reached an all-time high for the fourth year in a row. We mapped 524,518 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 2014. This year’s increase in SNC likely is due in part to prolonged wet weather in spring of 2013 which was very conducive to infection, and the near perfect conditions for symptom development and detection in 2014.

Usually the survey stops in northern Curry County because few symptoms have been observed south of there. In 2014, we extended the survey south through Curry County into Del Norte County and the northern half of Humboldt County in California. In Curry County we mapped 96 polygons representing 7,362 acres with symptoms. In California we mapped only 3 polygons (94 acres total): two just south of the Oregon border and one in northern Humboldt County.

The Humboldt County polygon was ground-checked and the yellowing was not due to Swiss needle cast (Zach Heath, USFS, personal communication). The two Del Norte County polygons were not ground-checked, but photographs taken from the survey plane suggested a rather weak SNC signature.

Swiss needle cast was present at all 14 of the Curry County ground-check polygons. Mean foliage retention ranged from 2.0 to 4.2 annual compliments with a mean of 2.7. Stand color ratings were either 2 or 3, with a mean of 2.4. Mean stand SNC rating was 2.6, ranging from 2 to 3. It is unlikely that SNC was the cause of discoloration in the two stands with the highest foliage retention (3.7 and 4.2).

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 Health Monitoring Program, and the Oregon Department of Forestry. Steve Larsen (ODF) piloted the plane. Danny Norlander (ODF) is the survey coordinator. The aerial observers were Bob Schroeter (USFS Region 6 FHP), Rob Flowers (ODF) and Bob Noyes (USFS).

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>

Oregon Swiss Needle Cast Aerial Survey 2014

Legend

Survey flight date

april 29

april 30

may 01

may 07

may 12

may 13

may 14

Swiss Needle Cast
survey boundary

2 mile survey grid

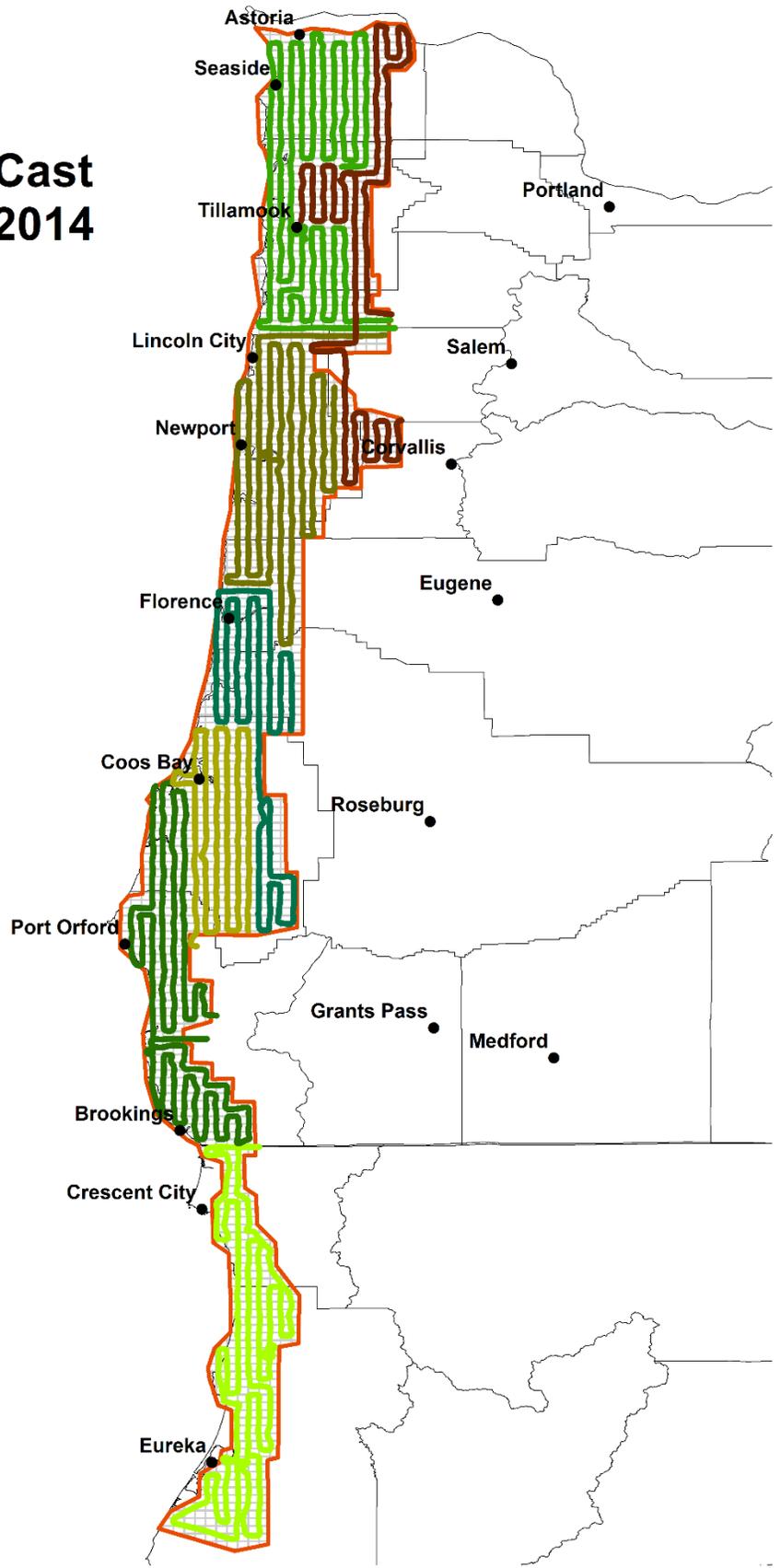


Figure 1. Area surveyed for Swiss needle cast symptoms, 2014.

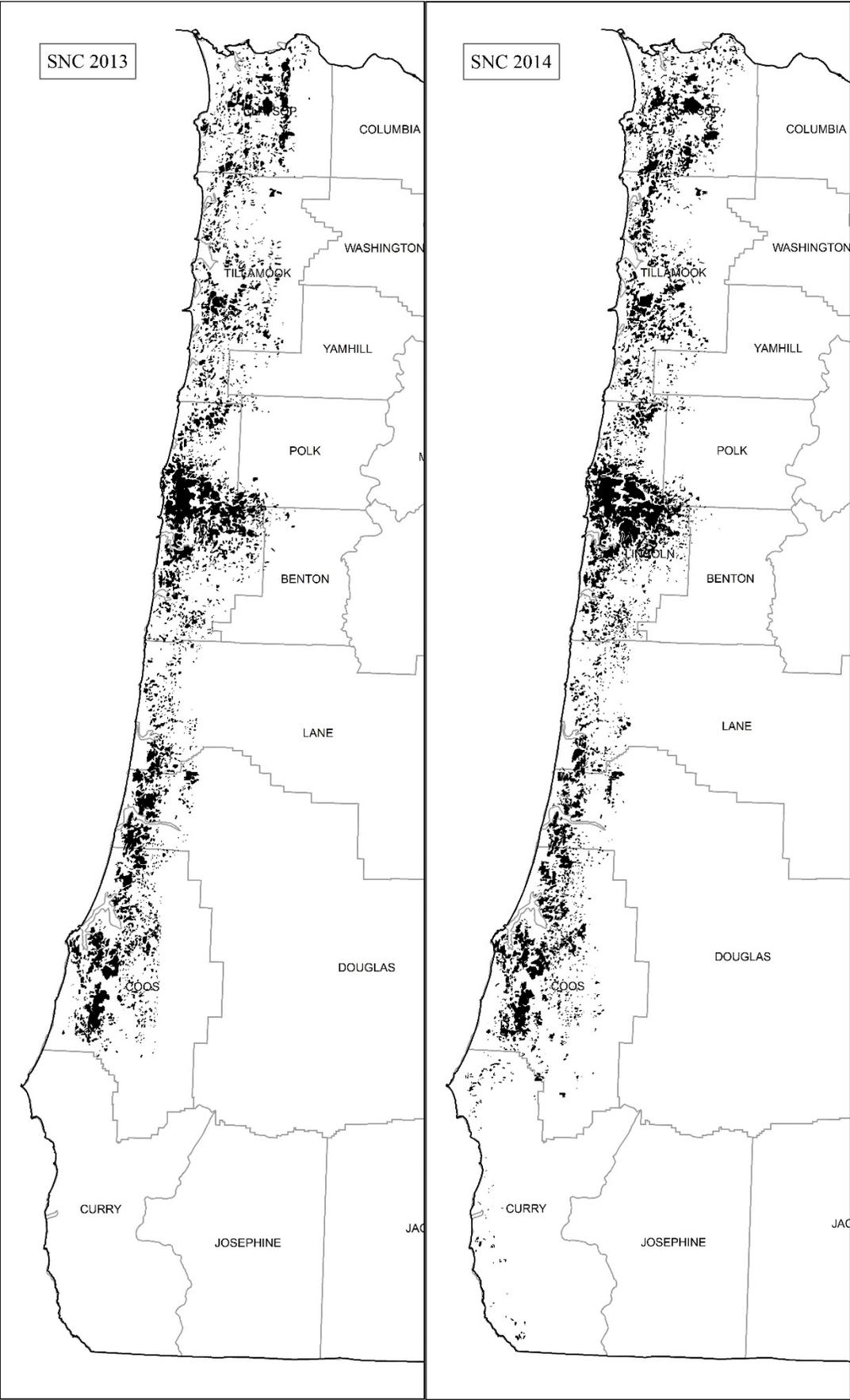


Figure 2. Areas of Douglas-fir forest with symptoms of Swiss Needle Cast detected in the 2013 and 2014 aerial surveys.

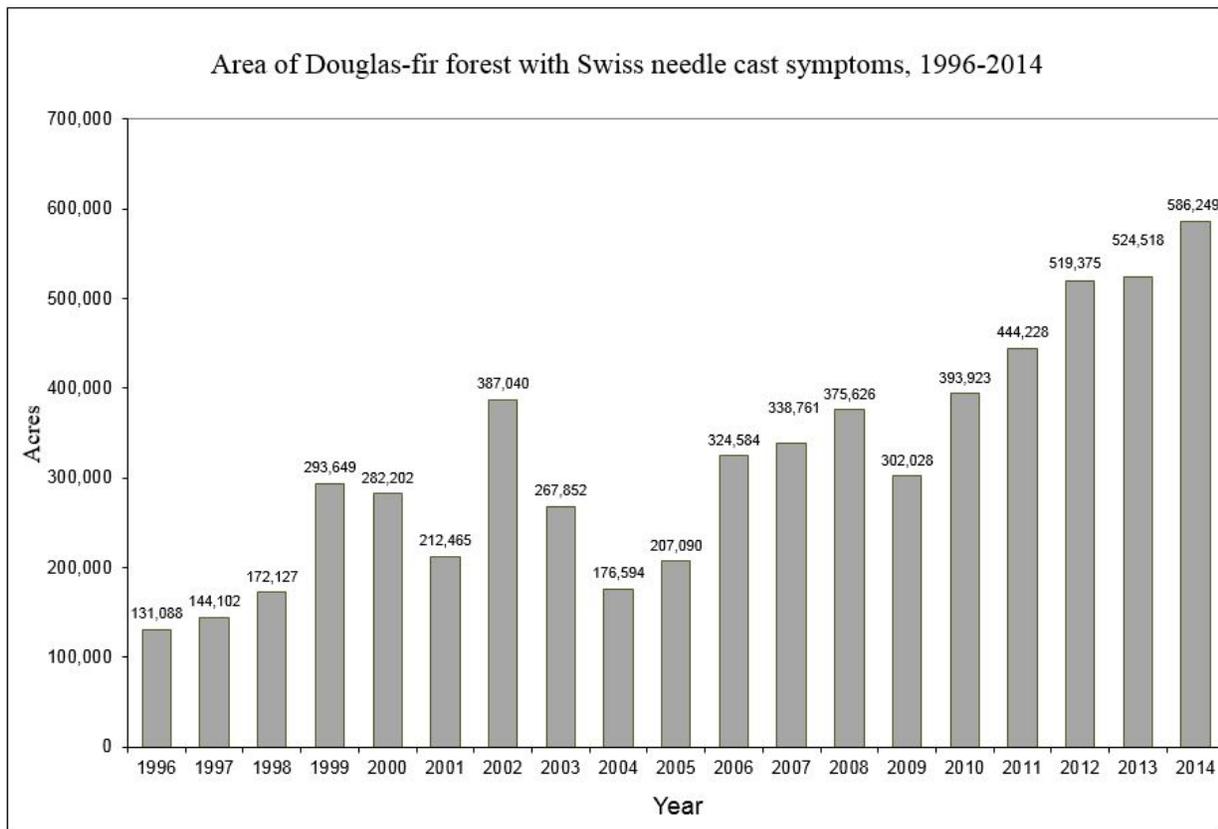


Figure 3. Area of Douglas-fir forest in western Oregon with symptoms of Swiss needle cast detected during aerial surveys conducted in April-June, 1996-2014 (2008 area estimated from partial survey consisting of 3 sample blocks).

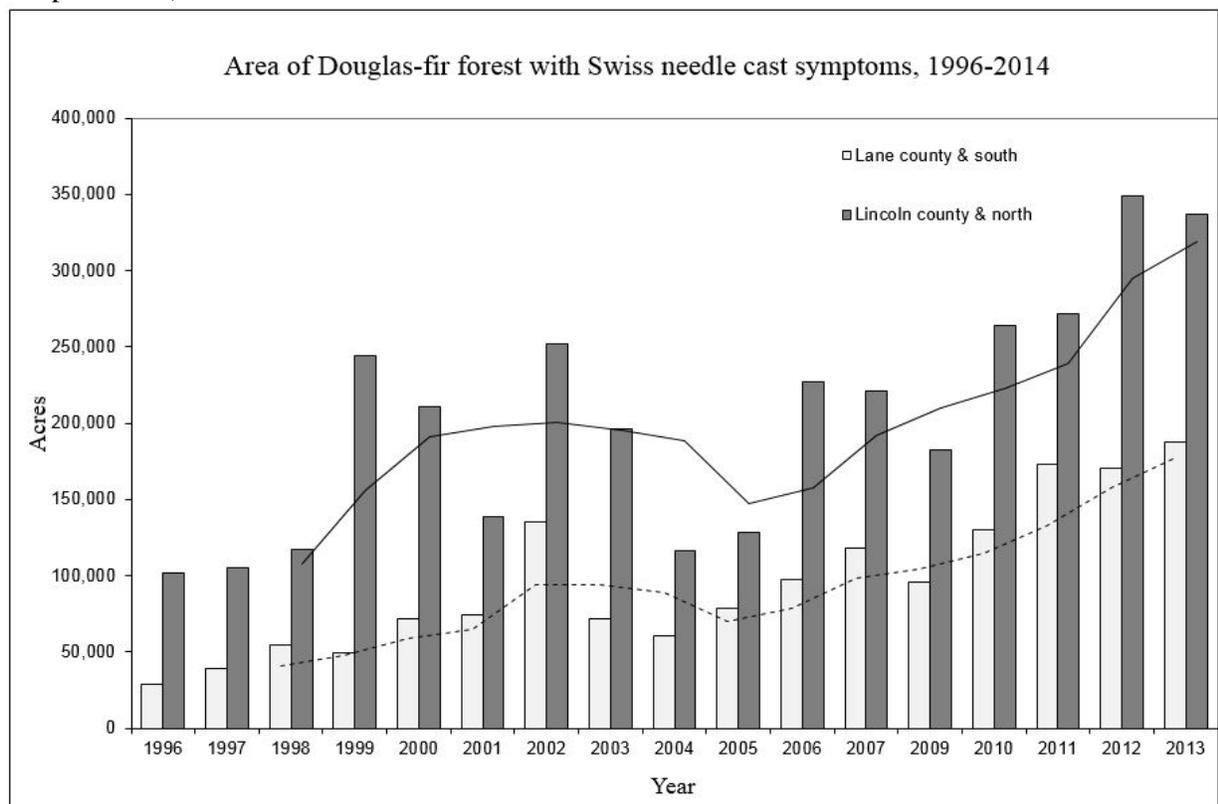


Figure 4. Area of Douglas-fir forest in western Oregon with symptoms of Swiss needle cast detected during aerial surveys conducted in April-June, 1996-2014; north and south halves of survey area (2008 area estimated from partial survey consisting of 3 sample blocks).