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NORTHWEST FOREST PLAN : THE FIRST TEN YEARS (1994-2003): STATUS AND TRENDS OF LATE-SUCCESSIONAL AND OLD-GROWTH FORESTS

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How many acres of late-successional and old-growth forests were there on federal lands at the start of the Northwest Forest Plan? How were they arranged on the landscape? How much was lost and gained in the first decade of the Plan? From what causes? How did the amounts and patterns of late-successional and old-growth forests differ from the expectations under the Plan?

We monitored the status and trends of late-successional and old-growth forests (“older forests”) on 24.4 million acres of land managed by the Forest Service, Bureau of Land Management, and National Park Service in the Northwest Forest Plan area between 1994 and 2003. We developed baseline maps from satellite imagery of older forest conditions at the start of the plan. We used remote sensing change detection to track losses of older forests on federally managed lands to stand-replacing harvest and wildfire between 1994 and 2003. We analyzed the amounts and spatial distribution of older forests using the mapped data. We also performed statistical analysis on inventory plot information collected on Forest Service and Bureau of Land Management lands. These analyses provided statistically rigorous estimates of older forest acres bracketed by confidence intervals. We used information on re-measured inventory plots to estimate net change in the amount of older forests on federally managed lands between 1994 and 2003.

We estimated the amount of older forest at the start of the Northwest Forest Plan corresponding to three different older forest definitions. The definitions used average tree size, canopy layering, canopy closure, and life form as defining attributes. The results ranged from 7.87 million acres (± 1.96 million acres) of federally managed lands with average tree size at least 20 inches (“Medium and Large Older Forest”), to 7.04 million acres (± 1.93 million acres) using a definition that recognizes variation in regional forest vegetation (“Older Forest with Size Indexed to Potential Natural Vegetation Zone”). 2.72 million acres (± 0.35 million acres) were in stands with average tree size 30 inches and greater, with multi-storied canopies (“Large, Multi-storied Older Forest”). At least 1.7 million acres of existing “medium and large” older forest were in fire-adapted vegetation types characterized by high fire frequency and low severity in the eastern Cascades and Klamath provinces. Up to 1 million additional older forest acres occurred in dry mixed conifer types in the western Cascades.

Our data indicated that total recruitment of “medium and large” older forest outpaced losses from all sources, resulting in a net gain between 2003 and 1994. We estimated a projected increase of about 600,000 acres of older forest in the first decade after the Plan. This was the net increase taking into account the amount of older forest removed by stand-replacing harvest and wildfire. The amount harvested by clearcutting between 1994 and 2003 was 0.2 percent of the total (17,300 acres), and the amount burned was about 1.3 percent (101,500 acres).

The initial amount, distribution, and arrangement of older forests on federally-managed lands appear to have met or exceeded Northwest Forest Plan expectations. Gains and losses during the first decade were within the range assumed by the Plan. But the large amount of older forest susceptible to catastrophic wildfire should be a concern for managers.

The monitoring design included both a map-based and plot-based approach. Older forest maps based on remote sensing allowed for a spatial assessment of landscape patterns, but map accuracy was low in some areas, especially the Eastern Cascades. The comparison of older forest estimates compiled from map and plot data can help us identify where the mapping technology and related analyses need the greatest effort to improve the accuracy of results. Remote sensing change detection was highly accurate for assessing older forest losses to catastrophic disturbance (clearcutting and stand-replacing wildfire). But technological improvements are needed to use remote sensing data for detecting less severe disturbance due to partial harvest or less severe burning. Plot data were not of sufficient resolution to allow for spatial analysis, or to identify causes of change. But estimates

made from plot data were unbiased, accurate, and precise. Future monitoring work will pursue approaches that tie the plot-based and mapped data sets plot and mapped data together more closely.

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STATUS AND TREND REPORTS

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