

Appendix B2 Natural Range of Variability

The steps followed to arrive at Natural Range of Variability (NRV) came principally from the description of the recent analysis completed on the east slope of the Cascade Range (Hessburg et al. 1999). Available data regarding seral stages over time are confined to the last 400 years. Because the fire return interval on the west slope of the Cascades is so long (approximately 200-300 years), there is little information that can be used to establish a pattern in which we have confidence. The method we used replaces time with space by comparing multiple watersheds over the same time frame. The theory is that sampling spatial patterns of vegetation with similar environment and disturbance factors reveals probable temporal patterns. Potential inadequacies of this method include insufficient time depth, incompatible disturbance and climate regimes, environments that are not homogeneous, and convergent environmental histories.

We chose two watersheds on the north half of the Forest to compare with the Sauk Basin (within which the White Chuck River is located). Seral stages by vegetation zone on these watersheds came from the Subregional Ecological Assessment for the Mt. Baker-Snoqualmie National Forest (USDA Forest Service, 1993), as subsequently refined by the Forest's Ecologists. We chose the two watersheds based on the similarity of area in the major potential vegetation zones, and climate as classified by ecozones (Henderson et al., 1992). All the watersheds chosen were in ecozones 10 and 11. The analysis land units were USGS Hydrologic Unit Codes (HUCs); large watersheds or groups of smaller watersheds. For this analysis we chose the following: Nooksack (HUC #17110004), and Upper Skagit (HUC #17110005).

For each HUC, we entered percent of each seral stage by vegetation zone into an Excel spreadsheet at each point where there was a change in proportions of seral stages. This gave us six to eight historic compositions of seral stages in each vegetation zone.

In an effort to eliminate possibly undesirable extreme values resulting from rare events, we chose the median 80 percent range of the values. Because of the manner in which the values were distributed, the 20 percent removed were the extreme low and extreme high values for each set. The remaining values gave us the ranges against which we compared the current condition in the White Chuck River basin.

To arrive at the current condition in the White Chuck basin, we first used stand year of origin. Year of origin was a function of either fire history or harvest history. Seral stage varied by Vegetation Zone. Stands develop and mature at different rates depending on Vegetation Zone as well as more specific environmental conditions within zones. Seral stage was based on the values in the following table.

Vegetation Zone	Early seral	Mid seral	Late seral single-story	Late seral multi-story
Western hemlock	0-22	23-180	181-407	>407
Pacific silver fir	0-40	41-306	307-507	>507
Mountain hemlock	0-40	41-306	307-507	>507