Scientific Research on the Importance of Downed Woody Debris in Forest Ecosystems

"Dying and dead wood provides one of the two or three greatest resources for animal species in a natural forest…if fallen timber and slightly decayed trees are removed the whole system is gravely impoverished of perhaps more than a fifth of its fauna". (Elton 1966, p. 279)

"A newly fallen tree, for example interacts only passively with the surrounding forest because its interior is not accessible to plants and most animals. But once fungi and bacteria, which are smaller than wood fibers, gain entrance, they slowly dissolve and enter the wood cells. And wood-boring beetles and termites chew their way through the wood fibers. Meanwhile, many other organisms, such as plant roots, mites, collembolans, amphibians, and small mammals, must await the creation of the internal spaces before they can enter. The flow of plant and animal populations, air, water, and nutrients between a fallen tree and its surroundings increases as the aging process continues". (Maser and Trappe, 1984 p. 12)

"As a fallen tree decomposes, it creates a gradually changing myriad of internal and external habitats. Plant and animal communities within a fallen tree are very different from those outside, but both progress through a series of orderly changes. As a fallen tree decomposes, its internal structure becomes simpler, whereas the structure of the plant community surrounding the fallen tree becomes more complex". (Maser and Trappe, 1984 p. 36)

"Machine entry in a stand reduces diversity because heavy equipment fragments and scatters class IV and V rotten wood. Class I and II trees may be salvaged or cut for firewood; class III trees that hang together and are not removed as salvage or firewood tend to become bunched or aligned along the direction of skidding. Habitat diversity declines to a fraction of what had been available; probably fewer kinds of organisms can thrive. Further, because woody substrates serve as long-term soil organic material and nutrient reservoirs, increasingly intensive timber management, coupled with shorter rotations, could significantly alter the role of decaying wood in the nutrient cycling processes." (Maser and Trappe, 1984 p. 48)

Recently downed tree proposed for salvage along Forest Road 395.

"Salvage logging following wind disturbance may have serious long-term implications." (Cooper-Ellis et. al, 1999 p. 2683)

"[o]ur results indicate that the downed and damaged trees play an important role in forest recovery and ecosystem resilience. Logging kills the aboveground portions of the trees, eliminates leaf and woody biomass, decreases evapotranspiration, scarifies the soil surface, increases isolation, and damages many soil and organic structures created by disturbance. These impacts reduce biotic control over microenvironments, increase the potential for biogeochemical and hydrological change and nutrient loss, enhance the role of seedling establishment in regeneration, and promote compositional change. Thus, the potential exists to convert the damaged area from a relatively intact system to a strongly modified site in which ecosystem control is reduced…retention of the residual biotic structure in the disturbed forest yields a stronger degree of control, with very different vegetational consequences." (Cooper-Ellis et.al, 1999 p. 2693)

(left) Recently cut black cherry at Timberline ATV Salvage Sale. (right) Dead and downed American Beech tree that is further along in decomposition process.