

Wind mortality in a natural deciduous forest - Draved Forest, Denmark

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Draved Forest is a species rich mixed, deciduous forest in southern Denmark. Parts of the forest have been left unmanaged since 1948, and those parts can be described as 'near-natural'. In a unique long-term study, more than 4000 trees have been monitored between 1948-2001 in those parts of the forest. All trees greater than 100 mm dbh (diameter at breast height) were mapped and recorded at 10 year intervals. Dbh was measured and a crown classification was made. In case of tree death, the cause of mortality was noted. In 1999 the most powerful hurricane ever recorded in Denmark caused great destruction of forest volume over large parts of Denmark. With the long-term monitoring in Draved Forest we had the chance to assess differing causes of tree mortality over a 50 year time period in an unmanaged, near-natural forest and compare long-term mortality with the single storm event of 1999. Species-specific mortality characteristics and the changing effects of tree size and growth rate on mortality through time were investigated.

Storm was found to be the major mortality factor affecting large trees in this forest, even in the long-term. Individual species showed different mortality patterns. *Betula pubescens* died more often and *Fagus sylvatica* less often than would be expected from their abundance. *Betula pubescens*, *Fagus sylvatica* and *Tilia cordata* were mainly wind-thrown, whereas for *Alnus glutinosa* and *Fraxinus excelsior*, only half of the mortality was due to wind damage. Competition was the main mortality factor for smaller, slow growing trees. Increased mortality of trees with larger dbh, the creation of multi-tree gaps and the recruitment in gaps after wind damage contributed to a significant change in forest structure.