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FOREST INVENTORY FOR SUPPORTING PLANT BIODIVERSITY ASSESSMENT

ForestBIOTA data on deadwood monitoring in Europe

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Abstract

Deadwood is a key ecological factor in forest ecosystems. Its occurrence is fundamental since it represents a microhabitat for hundreds of species of invertebrates, fungi, bryophytes, lichens, amphibians, small mammals and birds. In recent years, deadwood has been recognized as a relevant indicator for the assessment and monitoring of forest biodiversity. In this paper the methodology for surveying woody necromass proposed by the ForestBIOTA project under Regulation (EC) No 2152/2003 (Forest Focus) is described. The amount of deadwood found on 91 Intensive Monitoring Level II plot of the EU and ICP Forest condition monitoring programme range from 0 to 258 $m^3\ ha^{-1}$. In the examined areas, total deadwood volume does not differ significantly among forest types, due to the high intra-type variability. On the other hand, its distribution between coarse and fine necromass and among necromass components is highly dependent on forest types.

Key words: *Coarse necromass, biodiversity, deadwood, fine woody necromass, forest inventory, forest monitoring*

Introduction

Deadwood is an important component of forest biodiversity. Woody necromass, which consists of standing or uprooted dead trees, lying trunks, rotting root systems and old, decaying hollow trees, represents a microhabitat for many species of invertebrates, fungi, bryophytes, lichens, amphibians, small mammals and birds (Harmon et al., 1986; Raymond & Hardy, 1991; Mikusinski & Angelstam, 1997; Siitonen, 2001, Ódor & Standovár, 2001; Humphrey et al., 2002; Mason, 2003; Humphrey et al., 2004). Deadwood also acts as carbon sinks (Freedman et al., 1996; Harmon 2001), it is an important water-storing element during dry periods (Maser & Trappe, 1984) and it increases the overall productivity of the forest (Stevens, 1997). Furthermore, deadwood favours the connection between herbivores and detritivores in the process of decomposition of organic matter and the formation of humus, enhancing natural forest regeneration (Falinski, 1986; Kimmins 1998). Over the long term it also represents a stable source of mineral elements in the soil (Hagan & Grove, 1999), since decomposing tree trunks are true slow-releasing fertilizers (Carey, 1980; Schaetzl et al., 1989).

In managed forests, the amount of deadwood is usually much lower than in forests left to evolve naturally. It has been estimated that only 2–30% of the deadwood found in unmanaged forests occurs in managed ones (Guby & Dobbertin, 1996; Green & Peterken, 1997; Kirby et al., 1998; Jonsson, 2000, Ódor & Standovár, 2001). In managed stands, deadwood is often removed to avoid the outbreak of insect populations that could damage living trees, to remove all physical obstacles to silvicultural activity, or to reduce the risk of forest fires (Montes & Cañellas, 2006). Moreover, the number of old big trees in forest is usually low, because classical forest management is based on rotations shorter than species' longevity (Nocentini, 2003; Hahn & Christensen, 2004).

Some biodiversity-oriented management practices have been proposed to increase the quantity of deadwood; these include, prolonging the rotation period, leaving dead trees in the forest or creating

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