

Deadwood and old-growth stands are essential for birds

Deadwood and old-growth stands are critical resources for a wide variety of species groups. Both have become more abundant in forests of marginal economic importance. Not surprisingly, birds that rely on deadwood and old growth show positive population trends. However, in lowland forests especially, there is a lack of deadwood and old-growth stands as well as forest reserves.

Deadwood refers to dead tree material in various forms: standing and lying trees or parts of trees, but also root plates or tree stumps¹⁴. The main processes that create deadwood are ageing, windthrow, fire, and fungal or insect infestations. In most forests, ageing is the driving force. Deadwood is therefore much more abundant in old-growth stands than in young forests. Veteran trees with thick trunks and branches and large crowns are another particularly valuable feature.

The decay of deadwood is caused mainly by fungi and insects: after the bark of a dead tree falls off, the hard wood gradually softens until it turns into humus. The speed of this process depends on the tree species, humidity, exposure to wind and sun, summer temperatures and contact with ground vegetation or the damp forest floor¹⁴.

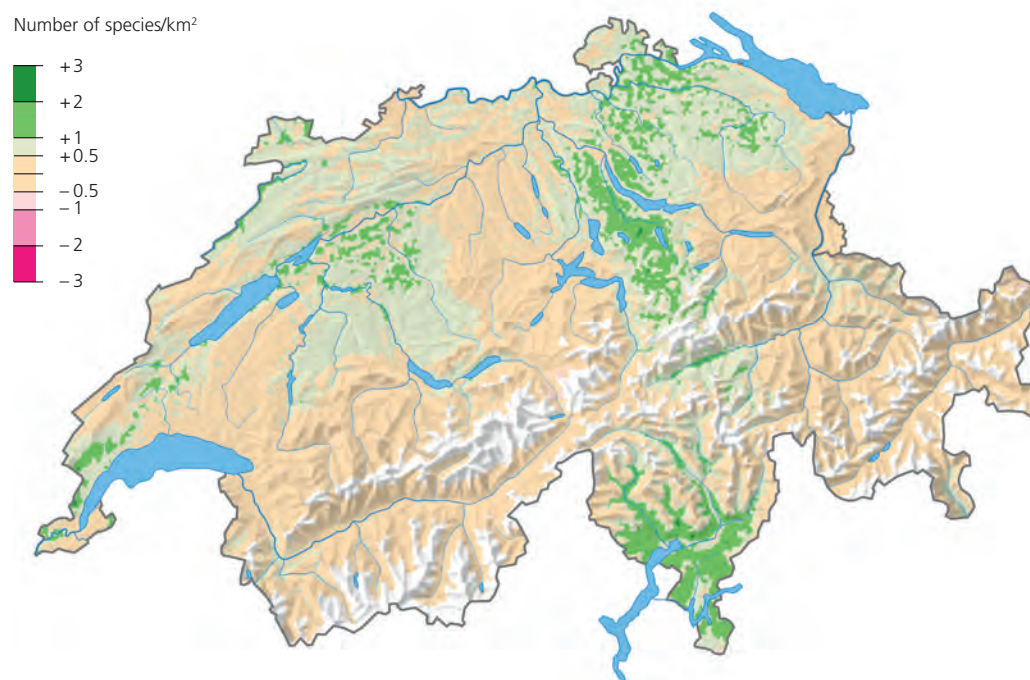
Habitat for numerous specialised organisms

Deadwood takes a variety of forms that change continuously throughout the process of decay, offering countless cavities that provide habitat for an equally large number of specialised organisms^{7, 17}. About a quarter of our native woodland species need deadwood, including more than 1700 beetles and over 2700 species of macrofungi⁸.

Without the influence of major events such as fire or storms, the creation of deadwood is a slow process¹⁸, and large amounts take a long time to form. In cultivated forests, where timber is regularly removed, the quantity of deadwood amounts to a few m³/ha and is thus much smaller than in unexploited forests, where the volume of deadwood can reach 200 m³/ha and make up almost half a forest's total timber volume^{2, 9, 15}. Because there are very few unmanaged forests in Europe following centuries of more or less intensive silviculture, many organisms that live in deadwood, especially insects, have become rare and are considered threatened^{11, 16}.

Important for many species of birds

Deadwood is also of great importance for several bird species. Dead trunks and large branches enable or facilitate the excavation of nesting cavities for woodpeckers, Crested Tit, Alpine and Willow Tit, and other cavity nesters. Natural cavities or cracks and hollows beneath dead, protruding pieces of bark are excellent nesting sites for species like the Eurasian Treecreeper. Dead and dying wood provides habitat for arthropods and their larvae, which several species of woodpecker feed on. The Black Woodpecker, for instance, likes to feed on carpenter ants, whose nests are close to the ground in spruce trees with rotting trunks. The Three-toed



Distribution change since 1993–1996 of eight common species that require deadwood and old-growth stands (Eurasian Green Woodpecker, Black Woodpecker, Great Spotted Woodpecker, Middle Spotted Woodpecker, Lesser Spotted Woodpecker, Crested Tit, Alpine and Willow Tit, Eurasian Treecreeper). The map combines the distribution change maps of all eight species.



Lying deadwood is extremely important for regeneration, especially in mountain forests. Young trees emerge from this decaying spruce trunk, where the snow melts earlier in spring than on the surrounding ground.



Old forests rich in deadwood are necessary to support specialised species, but are absent in many parts of the country, especially in easily accessible areas of the Central Plateau and Jura.

Woodpecker is a specialist feeder with a preference for bark beetles and longhorn beetles¹². The White-backed Woodpecker relies to a particular degree on large quantities of deadwood due to its preference for saproxylic insect larvae. Two typical habitats of the White-backed Woodpecker in northern Grisons contained 107 and 163 m³ of deadwood per hectare, respectively⁴.

The volume of deadwood in Swiss forests more than doubled between 1993–1995 and 2009–2013, increasing from 11 to 26 m³/ha on average^{1,3}, a development that at least partly explains the population increases of several bird species that rely on deadwood¹⁰. In the lower-lying, easily accessible woods of the Central Plateau and the Jura, however, the average volume of deadwood is still well below 20 m³/ha. The need for improvements, such as the creation of natural forest reserves where interventions are kept to a minimum and the forest is left to natural succession, is all the more urgent in these areas⁶.

Urgent need to promote deadwood and old growth

The shortage of old-growth stands and therefore dead and old wood is considered one of the greatest ecological deficits of managed forests. Accordingly, promoting deadwood and old-growth stands is an important federal objective, especially on the Central Plateau and in the Jura⁸. Natural forest reserves are at the forefront of this strategy and are to become core areas for deadwood-dependent species. However, due to the limited mobility of many saproxylic organisms, there would be little connectivity between populations in geographically dispersed forest reserves. Deadwood and old growth therefore need to be protected in the managed forests that lie between forest reserves by promoting old-growth patches and habitat trees, which are left standing until they decay⁸.

The target values of 25 m³/ha in the Pre-Alps and Alps and 20 m³/ha on the Central Plateau, in the Jura and the southern

Alps⁸ will presumably benefit most species of birds that depend on old and decaying wood. For the Three-toed Woodpecker, for example, a threshold value of at least 15 m³/ha on at least 100 ha of forest was calculated⁵. This value is already reached in most woodlands of the Pre-Alps and Alps today^{8,13}. The population of the Three-toed Woodpecker has indeed responded with increasing numbers in the past 15 years or so, and trends are equally positive for most other birds that depend on deadwood and old-growth stands. For the White-backed Woodpecker, however, these threshold values are insufficient. The species will only be able to spread in the long term if much larger areas of forest at low altitudes are left unmanaged for long periods of time, so that large quantities of deadwood and old growth can accumulate, or if old and dead trees are left much more frequently in managed forests. Many other specialists of deadwood stand to benefit from these measures as well.

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¹ Abegg et al. (2014a–d); ² Albrecht et al. (1988); ³ Brändli et al. (2015a–d); ⁴ Bühler (2009); ⁵ Bütler et al. (2004); ⁶ Bütler et al. (2006); ⁷ Harmon et al. (1986); ⁸ Imesch et al. (2015a–b); ⁹ Mayer et al. (1979); ¹⁰ Mollet et al. (2009); ¹¹ Monnerat et al. (2016a–c); ¹² Pechacek & Kristin (2004); ¹³ Rigling & Schaffer (2015a–d); ¹⁴ Scherzinger (1996); ¹⁵ Siitonen et al. (2000); ¹⁶ Speight (1989); ¹⁷ Vallauri et al. (2003); ¹⁸ Vandekerckhove et al. (2009)