

# White-backed woodpecker habitat restoration in Sweden suffers from data deficit

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A literature review conducted on the habitat requirements of the white-backed woodpecker (*Dendrocopos leucotos*) in Sweden has demonstrated a surprising lack of scientific knowledge regarding the species' habitat needs. Once found throughout most of sub-montane Sweden, the species underwent a rapid decline over the course of the last century – a direct consequence of forest management methods implemented in the 1950s. By replacing natural forests with monoculture stands of spruce or pine and actively removing deadwood, these management methods have eliminated suitable habitat nationwide and created a landscape in which the white-backed woodpecker cannot survive. Today, only a handful of these birds remain in the wild. In response, the Swedish Environmental Protection Agency established an Action Plan in 2005 for the conservation of the species and restoration of its habitat. Despite ensuing forest restoration efforts (entailing the clearing of conifers and creation of deadwood) across four provinces, and the release of 88 total captive-bred woodpeckers into the wild (as of 2014), white-backed populations have failed to recover.

This thesis sought to discover why restoration efforts have thus far had seemingly little effect on the recovery of the white-backed woodpecker in Sweden, particularly when the species persists in Norway, Finland, central Europe, Russia and Japan. Although the scientific community is in general agreement over the strong dependence of the white-backed on dead and decaying wood as both feeding and nesting substrate, no clear consensus could be found on the exact quantities of dead or decaying wood required to support a viable population in a given area. Observations of the white-backed are reported in forests containing anywhere from 10 to nearly 100 ha/m<sup>3</sup>. Complicating matters, the measurement units used to quantify deadwood often vary between studies, making comparisons between those studies difficult. Although it is challenging to acquire meaningful observations from the limited white-backed population in Sweden, no recent reports at all could be found on how the species forages in or moves about the modern landscape. Current restoration recommendations have consequently suffered, and the Action Plan lacks hard quantitative goals to guide restoration efforts.

Given the gaps in scientific knowledge of the species' exact habitat requirements (e.g. deadwood quantities and decay classes, tree species composition), this thesis presents a number of proposals for species recovery and habitat restoration plans. First, population tracking and methodical surveys of occupied forests should be conducted to understand how the species is using the landscape. Second, deadwood volumes should be increased throughout the landscape – not just in designated white-backed habitats. Third, a shift in focus from restoration of isolated habitats (e.g. 100 ha patches) to restoration at the landscape scale (e.g. 100 km<sup>2</sup> area) should be made. Additionally, two novel approaches to Swedish forest restoration could be considered: the creation of a single large reserve in central Sweden that would be capable of supporting a viable population; and alternatively, the centralization of restoration into core areas (e.g. pre-existing nature reserves) surrounded by “dynamic reserves” that would be transient in both time and space – an intriguing idea discussed in the literature with the capacity to appeal to most stakeholders. Although some good restoration work has begun, research must continue to hone efforts in the creation of quality habitat if the white-backed woodpecker population is to recover in Sweden.