

Thorell, M. 2003. Forest conservation strategy in southern Sweden: the role of small reserves and buffer zones.

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Abstract. Nature reserves are cornerstones in forest conservation, providing space for animals, plants, and habitats that are in need of protection. In highly fragmented landscapes such as southern Sweden, forest reserves are usually small, implying a high proportion of edge habitat, and possibly a high risk of local species extinction. In conservation biology, buffer zones (with conservation management and involvement of stakeholders) are recommended near reserves to reinforce their protection. Although temperate forest is of conservation concern, few studies have evaluated the role of small reserves and buffer zones. Here I examine small forest reserves in southern Sweden, and in particular potential buffer zones (around reserves that lack such zones).

To test the hypothesis that habitat quality per unit area is relatively high in small conservation forests in fragmented landscapes, structures important for forest biodiversity were quantified in the field for 49 randomly selected reserves (size 5–225 ha). The densities of large trees, and dead trees (snags and logs) decreased significantly with increasing reserve size, suggesting relatively high conservation values in small reserves. The mean size of woodland key habitats (where red-listed species can be expected) was 1.6 ha. In addition, a survey of the literature indicated that species richness for vascular plants, birds and beetles is not impoverished in small temperate semi-natural forests, compared to larger forests.

The possibility of reinforced protection by buffer zones was evaluated by studying 200 m wide potential buffer zones around the 49 reserves. On average, 37% of the surveyed forest in the reserves was southern deciduous forest, compared to 17% in the potential buffers, and 5% in other non-protected forest. Similar gradients were found for densities of large trees, and dead trees. These indicators of conservation value also correlated positively between reserves and their matched potential buffers.

To evaluate the possible involvement of stakeholders 33 non-industrial private forest owners (NIPFs) in 17 potential buffer zones were interviewed. For the NIPFs, the economic importance of the forest increased with increasing forest area of their property; for 52% of the NIPFs the forest was of high economic importance. The NIPFs tended to emphasize their own role in forest conservation. They were weakly positive to conservation, but disliked a reserve on their land. If forest protection should increase on their land, the NIPFs preferred buffer zones over reserves (when buffers assume retained land rights but reserves did not).

To estimate the influence of land use on conservation values in forest reserves and potential buffers, local comprehensive plans in 53 randomly selected potential buffers and matched control buffers were studied ($n = 32$ municipalities). The results indicate higher variation among conservation values and land use in potential buffers than among control buffers. Both area of national importance for conservation and area for exploitation occurred more often in potential buffers than in controls. In a questionnaire to the municipalities, conflicts with conservation were reported for 36% of the potential buffers. For 74% of the potential buffers around reserves no changes were foreseen in the next comprehensive plans. Around a few reserves, increased restrictions (conservation purposes) or enlargement of reserve were planned. If forest protection should increase in the municipality, buffer zone and enlargement of reserve was of equal interest among the municipalities; few respondents preferred the establishment of a new reserve elsewhere.

In highly fragmented landscapes both large and small forest reserves are needed to protect biodiversity. This thesis suggest that buffer zones are motivated from a conservation point of view around many small forest reserves in southern Sweden. NIPFs owning forest in the immediate surroundings of these reserves support to some extent the establishment of buffers on their land. Also, municipalities support buffer zones as a complementary strategy for forest conservation in southern Sweden. However, if buffer zones are implemented around small forest reserves, there is a need for a flexible approach concerning the design, involvement of stakeholders and what legal instruments to use.