

Additional file 1.

Identification of topic and stakeholders

A systematic review comparing the consequences for biodiversity of active management and non-intervention in forest reserves was first suggested at a seminar that Mistra EviEM arranged with stakeholders in September 2012. Among others, the seminar was attended by representatives of the Swedish Ministry of the Environment, SEPA, the Swedish Forest Agency and the Swedish University of Agricultural Sciences.

SEPA, the Swedish Forest Agency and their counterparts in other countries can be regarded as key stakeholders in this context, being responsible for issuing general regulations and advice concerning forest conservation and restoration. Regional and local environmental authorities and major forest companies are likely to find the proposed review useful too, since they are responsible for much of the practical management of forest reserves and voluntary set-asides, respectively.

A draft pilot study of the topic was compiled by Mistra EviEM during spring 2013, and comments on this draft were received from stakeholders representing universities, government agencies, non-governmental organisations and forest companies. All of the stakeholders were in favour of the proposed review, and several of them expressed enthusiasm, judging the topic to be highly interesting and very important. However, some of them also warned that the relevant scientific literature is likely to be quite limited, and that most of the existing studies have compared effects of management and non-intervention over a relatively short period.

Partly as a way of handling these problems, it was suggested (by one or several stakeholders) that

- the review should not be restricted to forest reserves (as originally proposed) but also take voluntary set-asides into account;
- the review should cover forests set aside throughout the temperate and boreal zones;
- the outcomes studied should not only include measures of biodiversity as such, but also measures of forest structure and other conditions known to influence diversity, possibly also population dynamics of individual target species;
- it could be useful to study effects not only of prescribed burning but also of wildfires.

Based on the final version of the pilot study, the Executive Committee of Mistra EviEM decided in November 2013 to initiate a systematic review of how the biodiversity of forest set-asides is affected by active management. However, the Committee recommended that a systematic map of the subject area (i.e. a systematic inventory of the available evidence) be considered as an alternative if the evidence turns out to be too heterogeneous to allow quantitative analysis of all relevant management options. A systematic map does not provide answers to the review question, but it gives an overview of the evidence base, possibly identifying subtopics that could be addressed by full systematic review but also indicating areas where more research is needed.

As originally framed, the primary question to be answered by the review read as follows:

How does active management affect biodiversity in forest reserves?

This wording may imply an attempt to explore the processes involved in various forms of management, however, whereas the review actually should restrict itself to elucidating their impacts. Moreover, since it seemed reasonable to include forest stands set aside for conservation on a voluntary basis, and also forests under restoration (rather than restricting the scope of the review to more or less untouched forest reserves), the following modified review question was approved by Mistra EviEM's Executive Committee:

What is the impact of active management on biodiversity in forests set aside for conservation or restoration?

In February 2014, prior to completion of the draft review protocol, Mistra EviEM arranged a meeting with stakeholders specifically concerned by the subject of the review. The meeting was attended by representatives of the Swedish Forest Agency, the National Property Board of Sweden, five county administrative boards, the Swedish Species Information Centre, the Swedish University of Agricultural Sciences, BirdLife Sweden, the Swedish Botanical Society, WWF Sweden and the Swedish Society for Nature Conservation.

The suggestions put forward at this stakeholder meeting included the following:

- The protection status of a studied forest area is not essential for its relevance to this review. It is sufficient that the area is not subject to large-scale forestry and that the interventions studied there could be useful as elements of the management of protected forests. Studies of urban woodlands that have been excluded from commercial forestry for the benefit of outdoor recreation rather than nature conservation could also be relevant.
- One potentially relevant intervention not mentioned in the pilot study is the reintroduction of e.g. lichen, beetle or bird species to areas from which these species have disappeared. Fences intended to enclose or exclude cervids or wild boar could also be conceivable as tools for the management of forest set-asides.
- While many studies have been made of how pyrophilous species are affected by prescribed burning, it would actually be more interesting to find out whether such species could also benefit from other kinds of active management.
- It would be valuable to clarify how the intensity and areal extent of various management practices affect target species and other aspects of biodiversity.

Several of the stakeholder suggestions were included in the draft protocol, which was then open for public review in May 2014. During this review, stakeholders suggested additional modifications, some of which have been incorporated in the final version of the protocol.