

Summary

Sweden's environmental policy is guided by 16 environmental quality objectives, covering the entire environmental policy field, from climate change and acidification to chemicals and the urban environment. The overarching 'generation goal' is to 'hand over to the next generation a society in which the major environmental problems have been solved, without increasing environmental and health problems outside Sweden's borders'.⁴

Since 70 per cent of Sweden's land surface is covered by forest, the environmental quality objective that entirely focuses on the forested landscape – 'Sustainable forests' (*Levande skogar*) – is crucial for achieving the generation goal. In this report, the preconditions for achieving this objective cost-efficiently are analysed.

Modern forestry is in many ways a success story. It has made it possible to simultaneously increase both the extraction of wood and the remaining stock of growing trees.

However, the negative environmental impact of modern forestry is obvious. When strongly diversified natural forests are replaced by homogeneous and biologically poor production-oriented forests, the necessary living conditions for many species disappear. The supply of partly or completely dead trees and dead wood – crucial for many forest species – is diminishing. Some species, like moose or raspberry, can benefit, but many more are losers. The transformation affects everything from wood fungi, lichens and mosses to insects, birds and mammals.

This trend was apparent as early as the 1980s and 1990s, in connection with the adoption in 1992 of the UN Convention on Biological Diversity, CBD. One outcome of the discussion was the

⁴ https://www.miljomal.se/Global/24_las_mer/broschyter/2016/Swedens-environmental-objectives.pdf

adoption in 1993 by the Riksdag (Swedish Parliament) of a new Forestry Act, which in an introductory article highlights that, in forestry, preserving the biodiversity of forests shall have the same importance as the high and sustainable production of timber.

When the Riksdag adopted the new environmental quality objectives in 1998, the aim of the Forestry Act was further clarified in the objective ‘Sustainable forests’ (*Levande skogar*):

‘The value of forests and forest land for biological production must be protected, at the same time as biological diversity and cultural heritage and recreational assets are safeguarded.’

Repeated evaluations of the new policy have identified several long-term, positive consequences on biodiversity. The amount of forest land under formal protection has increased, as has the amount of dead wood in the landscape. Other parameters have shown a less positive development. One example is that the share of sensitive biotopes that show a ‘strong negative impact’ from felling is growing. Overall, both the Swedish Forest Agency and the Swedish Species Information Centre (*Artdatabanken*) at the Swedish University of Agricultural Sciences conclude that there is still a long way to go before the environmental quality objective can be achieved, and it is not even clear whether developments are moving in the right direction.

Environmental aspects in forestry policy

Efforts to limit or neutralise the negative environmental impact of forestry can be described as being based on two pillars:

- One is that the Government ensures that more areas are given formal protection, mainly as nature reserves or habitat protection areas (*biotopskyddsområden*). This is achieved either by the state buying the land or, increasingly commonly, compensation being given to landowners for limiting their possibilities to harvest wood. The costs are covered by the government budget.
- The other is that the legislation is based on the assumption that landowners, on their own initiative, will exempt a share of their estates from commercial forestry, but also adapt the

forestry on managed land in ways that limit the negative impact on biodiversity. This policy is based on the principle of ‘freedom under responsibility’, which means that responsibility for the overall adaptation of forestry on managed land lies with the landowner and should not be enforced by the authorities. This explains why the Forestry Act (at least as it is applied by the responsible authorities) offers limited possibilities to make specific demands on landowners – this goes in particular for larger forest owners.

In the absence of mandatory requirements, the voluntary certification systems play a major role. By certifying the forest, the landowner promises to go further in their adaptation of management than is required by the legislation, including exempting a share of the forest (in particular ‘key biotopes’) from forestry. In return, the harvested timber – and the products made from it – may be labelled with the certification scheme logo, which is considered to give advantages on the market. At present, two thirds of managed forests are covered by at least one of the two established certification schemes: the Forest Stewardship Council (FSC) and the Programme for Endorsement of Forest Certification (PEFC).

To achieve the objective, at least 20 per cent of biotopes need to be protected

Both Swedish and international research shows that at least 20 per cent of the biotopes in the forest need to be found in a more or less unaffected state if the environmental quality objective is to be achieved.

An expert report from the Environmental Advisory Council in 1997 showed that at least half of that requirement (8–16 per cent – more in southern Sweden, less in the north) could only be fulfilled by exempting sufficiently large, representative and well-connected areas from forestry and protecting them as nature reserves.

The additional protection was assumed to be possible by adapting forestry in managed areas. This could be done by leaving or creating dead wood in connection with fellings, exempting areas along wetlands, lakes and watercourses from fellings, preserving the spontaneous mixture of tree species, and saving minor areas of great

biological value. In general, the forestry methods used should mimic the natural disturbance regimes (mainly recurrent fires) that renew most forest biotopes under natural conditions.

Choice of strategy strongly affects costs

A prerequisite for the minimum level of 8–16 per cent as nature reserves to be sufficient is that the protected areas are well-chosen, sufficiently large and sufficiently well-connected. Another prerequisite is that the adaptation of forestry in the managed areas is sufficiently extensive and of adequate quality. If any of these factors fail, larger areas need to be permanently protected in reserves.

From a conservation point of view, it is of minor importance whether society chooses a strategy that results in a need to protect larger areas in nature reserves than the abovementioned 8–16 per cent, or a strategy where the estimated minimum level is sufficient. In contrast, the choice of strategy will have a strong impact on the amounts of timber that can be extracted from the forest, and thus also on the socio-economic cost of achieving the environmental quality objective.

In the report it is estimated that the loss of extractable timber can be limited to 20 million m³ per year (equalling 17.5 per cent of annual growth) if the need to establish nature reserves is limited to 8–16 per cent of the productive (growth above 1 m³/ha/yr) forested area.

Expressed as net present value of a persistent, stable annual net revenue, this corresponds to a socio-economic cost of SEK 120–200 billion.

Lack of incentives

‘Freedom under responsibility’ means that government policy does not provide any incentives – either positive or negative – that can contribute to the achievement of the environmental quality objective. Instead, the development is dependent partly on the private commitment of landowners and partly on the certification schemes, thus the market. One example of the latter is that the

application of the FSC set of rules has caused a very controversial de facto stop to almost all logging activities in ‘key biotopes’.

Large climate benefit if the forest environmental quality objective is achieved

A positive side-effect of achieving the forest environmental quality objective is that large amounts of carbon dioxide will be stored permanently in the forest landscape, partly because larger areas will be exempted from felling and partly because the amount of dead wood will grow outside the nature reserves as well. Over a longer period (>100 years) an estimated 1.2–1.3 billion tons of CO₂ will be permanently accumulated in the forests. The socio-economic value of this storage is at least equivalent to the cost of the unavoidable loss of wood harvest potential. Thus, it seems possible to achieve the environmental quality objective of ‘Sustainable forests’ (*Levande skogar*) at a low or even negative socio-economic cost.

Proposals for action to achieve the environmental quality objective ‘Sustainable forests’ (Levande skogar)

1. Concretise in numbers, also on regional level, the long-term content of the environmental quality objective. The Riksdag and the Government have to clarify the total areas that need to be protected in different parts of the country and the volumes of dead wood needed long-term, etc. The present vagueness concerning the long-term goals causes an uncertainty that inhibits efforts and paves the way for conflicts. A new national ‘deficit analysis’ of biodiversity in the Swedish forest landscape is needed to provide a good basis for such decisions.

2. Reintroduce a requirement for forest owners to maintain up-to-date forestry and environmental documentation (SMÖR 2.0) on their holdings. To enable landowners and the authorities – in interaction and with a regional perspective – to promote development that limits the conflicts between production and environmental targets, there is a need for improved, uniform, digitalised documentation. SMÖR (‘forestry and environmental

documentation'), which was mandatory during the period 1999–2007, should be re-introduced in a modernised form. More comprehensive forestry plans (more extensive than *SMÖR*) are already mandatory in the two thirds of forest area already under certification.

3. Use forestry methods that mimic natural disturbances (fires, storms, etc). Improve quality and ensure that greater consideration is given to the natural environment in managed areas. The report discusses three alternative ways forward ranked according to their potential to help achieve the environmental quality objective in a cost-effective manner:

Alternative A: Raise 'the tolerance threshold'. The present interpretation of the legislation made by the authorities is that for smaller fellings, landowners can be required to give consideration to the natural environment (including leaving harvestable trees) to the extent that this corresponds to up to 10 per cent of the value of the entire felling. The 10 per cent 'tolerance threshold' should be applied to all fellings, not only minor ones (typically carried out by minor landowners). Such a change would radically improve the preconditions for a dialogue between the Forestry Service and landowners/entrepreneurs respectively in order to ensure consideration is given to the natural environment in a locally adapted and efficient manner.

Alternative B: Strengthen the FSC certification scheme through public procurement and increased transparency. Two thirds of Sweden's forested area is already certified by at least one of the certifying schemes, FSC or PEFC. States, regions and municipalities should contribute to strengthening the position, primarily of FSC, by certifying their own forest properties and requiring FSC certification in procurement, for building permits and for larger energy plants, for example. This alternative implies a high degree of transparency concerning felling permits, forestry plans (in addition to *SMÖR 2.0*) etc., plus public support to actors that scrutinise certification rule compliance. The FSC requirements need to be strengthened and open for local adaptations.

Alternative C: Include further detailed, mandatory requirements in the Forestry Act. If the number of mandatory requirements in the Forestry Act is expanded, there would be greater

scope for the authorities to make additional, locally adapted requirements demanding that consideration be given to the natural environment (up to the ‘tolerance threshold’).

4. Use carbon sequestration in the reserves as a means to solve the compensation issue. Forests that are permanently exempted from forestry will for many decades store increasing amounts of carbon dioxide in the growing stock of wood. If landowners are given the possibility to be rewarded for this climate benefit – for instance through the EU Emissions Trading System or the new Swedish emission reduction obligation – the need for public money to finance the protection of valuable forests would be reduced. Such a system must be designed such that Sweden’s contribution to global climate policy efforts, through a combination of emissions reductions and carbon sequestration, is greater than if the present policy continues, which only focuses on emissions reductions and has no incentives for carbon sequestration in forests.

5. Make the entire forestry industry partly responsible for the financing of the nature reserve network. At present, forestry and the wood-based industry have no incentive to contribute to achieving the environmental quality objective at as low a socio-economic cost as possible. To change this, a ‘conservation charge’ should be introduced on roundwood delivered to larger wood-consuming plants (sawmills, pulp industries, energy plants). The revenues would be transferred to a fund, which would also receive resources from the Government. The assets of the fund would be used to compensate landowners when forest areas are given legal protection as nature reserves or habitat protection areas. The forestry industry should be given some influence on how the fund resources are used. When the environmental quality objective is achieved, both the charge and the fund would be discontinued. With the charge, the environmental costs caused by forestry would be mirrored in the price of wood-based products.