

# National Strategy for Thriving Wetlands





# Contents

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Introduction	4
Purpose	5
Background	5
The Strategy and the Environmental Quality Objective	6
Basic Elements of the Strategy	8
Wetlands and Landscapes	10
Sustainable Use of Wetlands	12
Conservation of Wetlands	16
Restoration and Establishment of Wetlands	18
Knowledge and Information	24
Sweden's International Responsibilities	27
Strategy for Thriving Wetlands – Roles and Responsibilities	28

## Photographers:

*Tore Hagman/N:* p 1/ Red cottage at Lake Hornborga, p 18/ Wetland at Broddetorp farm, p 21 photo 2/ Farm pond, p 27/ Cow grazing in the shallow waters of Lake Hornborga.

*Jan Töve/N:* p 2/ Daybreak at Lake Hornborga, p 6 photo 1/ Morning at the Botten mire, p 7 photo 2/ Alder swamp with Tufted Sedge, p 21 photo 1/ Hay-making at the mire, p 21 photo 3/ Shoveler on grazed shoreline meadow, p 24/ Vasikkavuoma hay-making marsh, p 28 photo 1/ On a hike among Fragrant Orchids.

*Jan Elmelid/N:* p 4/ Wood Sandpiper.

*Torbjörn Lilja/N:* p 6 photo 2/ Barn for hay-making in Tornedalen, p 26 photo 2/ Cranberry in bloom.

*Jonas Forsberg/N:* p 6 photo 3/ Whooping Swans at Lake Tysslingen, p 13 photo 1/ Road along autumn mire.

*Lennart Mathiasson/N:* p 7 photo 1/ Autumn mire at Tönningfloarna.

*Peter Lilja/N:* p 7 photo 3/ A well-camouflaged Common Tree Frog.

*J-P Lahall:* p 8 photo 1/ Sunrise at forest lake.

*Andy Horner/N:* p 8 photo 2/ Drosera sp. In close-up.

*Sture Bäck/N:* p 10/ Meandering stream in the mire.

*Tor Lundberg/N:* p 12 photo 1/ Snowmobile on a snowcapped mire.

*Per-Olof Nystrand:* p 12 photo 2/ Vehicle damage on a mire in Jämtland.

*Pål-Nils Nilsson:* p 13 photo 2/ Drying peat the traditional way.

*P Roland Johansson/N:* p 16/ Bog pool at Källmossen.

*Jan Norrman/RAÄ:* p 26 photo 1/ Alluvial meadows at Pyöreänoja.

*Sixten Jonsson/N:* p 28 photo 2/ Ripe Cloudberry.



## Introduction

The Swedish Parliament has established 16 environmental quality objectives to guide Sweden towards a sustainable society. All different sectors are involved in the implementation of these objectives, aiming to solve the major environmental problems within one generation.

The environmental quality objective Thriving Wetlands sets the framework for conservation and sustainable use of wetlands. There are five interim targets dealing with the elaboration of a national strategy, protection of mires, forest roads, establishment of wetlands on agricultural land, and action programmes for threatened species. Thriving Wetlands and the interim targets are described further below.

This document constitutes a national strategy for the conservation, restoration, establishment and management of wetlands. In Sweden, the term “wetland”<sup>1</sup> applies primarily to mires, wet forests and meadows, ponds, shallow lake areas and shore environments. The strategy has been adopted jointly by the Swedish Environmental Protection Agency, the Swedish Board of Agriculture, the Swedish Forest Agency and the National Heritage Board, after consultation with the County Administrative Boards and other authorities, as well as stakeholder organisations and NGOs.

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<sup>1</sup> In Sweden, wetlands are defined as areas where water lies at or slightly above or below ground level for at least a large proportion of the year. The term “wetland” also encompasses water bodies covered with a floating raft of vegetation. Wetland vegetation is mostly hydrophilous. Thus, other aquatic environments such as lakes, rivers and streams or shallow marine waters that are considered as wetlands according to the Ramsar Convention, are not included.

The strategy provides a basis for the authorities' ongoing work with wetlands, in consultation with other interested parties. It corresponds to interim target 1 – the elaboration of a national strategy – of the environmental quality objective Thriving Wetlands.

In addition to the introduction and a review of the considerations on which it is based, the strategy document contains six sections which deal with various aspects of the use, preservation, restoration, establishment and management of wetlands. There is also an outline of the allocation of responsibility which the four concerned agencies deem appropriate for future efforts in this area.

## Purpose

The purpose of the strategy is to facilitate work relating to environmental quality objectives through year 2010, and to establish the necessary conditions for achieving the objective of Thriving Wetlands by year 2020.

The strategy is also intended to contribute to fulfilment of Sweden's obligations under the Ramsar Convention and the Convention on Biological Diversity, and to the achievement of environmental quality objectives other than Thriving Wetlands. The proposed measures also apply to the objectives entitled Zero Eutrophication, A Varied Agricultural Landscape, Flourishing Lakes and Streams, Sustainable Forests, A Rich Diversity of Plant and Animal Life, and ultimately A Balanced Marine Environment and Good-Quality Groundwater.

Suggestions for future approaches to achieve Thriving Wetlands will be developed further during 2007 as a basis for the in-depth evaluation of the environmental quality objective.

## Background

Wetlands perform many important ecological and water-conserving functions and contain a significant portion of Sweden's biological diversity. For thousands of years, they have had great importance for how humans have altered landscapes for both economic and social purposes. The location and growth of settlements have to a large extent been related to water and wetlands. Wetlands still comprise an important economic resource from the standpoint of forestry and other activities.

With over nine million hectares of wetlands – roughly one-fifth of the total land area – Sweden is one of the countries of the world in which wetlands are proportionally most abundant. It is estimated that around one-fourth of the country's original wetland area has disappeared as a result of drainage and cultivation, primarily for farming and forestry purposes. The greater portion of the remaining wetlands has been influenced in varying degree by human activities.

The pressure on wetlands remains, especially in certain regions, but there has been no comprehensive analysis of changes in total wetland area at the na-



tional level. The discontinuation of grazing and haymaking poses a serious threat to the preservation of valuable natural and cultural heritage features of Sweden's agricultural landscape. In some regions of the country, precipitation of nitrogen compounds has led to changes in wetland vegetation.

## The Strategy and the Environmental Quality Objective

### Environmental quality objective: Thriving Wetlands

The ecological and water-conserving function of wetlands in the landscape must be maintained and valuable wetlands preserved for the future.

#### **Interim target 1: Strategy for protection and management**

A national strategy for the protection and management of wetlands and wet woodlands will be drawn up by 2005.

#### **Interim target 2: Mire Protection Plan**

By 2010 long-term protection will be provided for all the wetland areas listed in the Mire Protection Plan for Sweden.

#### **Interim target 3: Forest roads**

By 2006 forest roads will not be built over wetlands with significant natural or cultural assets or in such a way as to adversely affect such wetlands.

#### **Interim target 4: Wetlands on agricultural land**

At least 12,000 hectares of wetlands and ponds will be established or restored on agricultural land by 2010.



#### Interim target 5: Action programmes for threatened species

By 2005 action programmes will have been prepared and introduced for threatened species that are in need of targeted measures.

It is the position of the government that the environmental quality objective involves the preservation of biodiversity and valuable cultural heritage features in various types of wetland throughout the country, and also that wetlands as far as possible should be protected against exploitation. In the process of developing the strategy, the objective of Thriving Wetlands has been interpreted to include, among other things, the following aspects:

**Ecological functions.** Wetlands are required in sufficient amount and variety to ensure the survival and dispersal of wetland species within their natural ranges. The specific structures and functions of various wetland habitats shall serve to ensure the long-term survival of representative species.

**Water-conserving functions.** The capacity of wetlands to retain and filter water, even out water flows and modulate local climate needs to be strengthened.

**Preserving valuable wetlands for future generations.** The natural and cultural assets of the most valuable wetlands, and the long-term maintenance of their functions, shall be ensured through a combination of legal protection, management, voluntary commitments and sustainable use.

The above-noted ecological and water-conserving functions are also impor-



tant for the use of wetlands as a natural resource, and for the regulation of greenhouse gases.

Preserving the functions of wetlands requires both conservation measures and greater efforts to ensure that wetlands are utilized in a sustainable manner. In order to achieve the objective of Thriving Wetlands, it is also important to re-establish wetlands and their functions in the landscape. The emphasis of the wetlands strategy is laid on those areas and activities that are relevant to the interim targets which require increased measures during the next few years.

Interim Target 4 includes the establishment and restoration of wetlands in agricultural landscapes, to be carried out during 2000-2010. As this target is deemed to be the most difficult to fulfil, extensive efforts are required to strengthen and improve the necessary measures. Implementation of measures on behalf of endangered species (Interim Target 5) need to be co-ordinated with other conservation measures such as management of protected areas; but that is something which is not considered in any great detail in this strategy.

## Basic Elements of the Strategy

Conservation, use and restoration of wetlands is performed in light of the landscape perspective

The biodiversity and valuable cultural features associated with Sweden's various types of wetlands are to be preserved and enhanced. This is to be



accomplished by means of long-term legal protection, restrictive granting of permits and exemptions, environmental consideration, and careful restoration of wetlands. This will also result in improved prerequisites in favour of endangered species. A far-sighted and co-ordinated approach will be applied to the conservation, restoration, establishment and management of wetlands. For that work to be cost-efficient, there is a need for planning of landscapes as a whole, door-to-door activities, co-ordination, and counselling. Opportunities to preserve or restore wetlands within the context of the EU Water Framework Directive should be taken advantage of.

#### The wetland area will not be reduced

Exploitation of wetlands should be avoided as far as possible; the need for compensatory measures shall be taken into consideration. Priority should be given to restoration and establishment of wetlands in areas where many wetlands have disappeared or been subjected to encroachments.

#### Wetlands with high nature conservation and cultural heritage values and wetlands with intact hydrology are conserved

High nature conservation values can consist of unexploited and undisturbed conditions, great variety of species and habitats, or rare flora and fauna. High cultural heritage values include inter alia continuity in traditional mowing and grazing, and preserved physical remains and features which define the character of the landscape. Increased emphasis is placed on the protection and re-establishment of the ecological, hydrological and hydrochemical functions of wetlands within their respective landscapes, where greatest consideration is accorded to the most endangered wetland types.

#### Subsidiarity and local community participation are guiding principles for working with wetlands

Nature and cultural heritage preservation measures should be planned and implemented with the greatest possible support and participation of local communities. Ultimately, those who are affected by decisions or measures should also be provided with opportunities to participate in such processes. This may involve anchoring strategies and programmes with stakeholders, or establishment of local and regional forums with representatives of affected and interested parties. Spreading knowledge about the history, functions and ecosystem services of wetlands among those who are directly affected at the local level is a prerequisite for fulfilling the environmental quality objective.



## Wetlands and Landscapes

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The ecological and water-conserving functions of a wetland both influence and are influenced by the surrounding landscape. Many wetland species are dependent on adjacent ecosystems during various stages of their life-cycle. The landscapes of today have been formed over a long period of time, and wetlands have always played a significant role in the lives of human beings. Often found in or near wetlands are traces of human activity which testify to their significance. The landscape features and cultural remains which are or have been related to the use of wetlands are included within the scope of this strategy.

One way to evaluate a landscape as a whole, or the general impression of it, is to adopt a landscape perspective. This includes an understanding of how the landscape has been used in the past and is being used today. Within such a perspective, all components of the landscape are considered. These may include the range and distribution of species, traces of past human activity, structures, substrates, ongoing processes dating from various periods, and current uses of wetland resources. A comprehensive landscape perspective can be helpful in the further development of existing forms of national and regional aid schemes, finding optimal locations for the establishment of new wetlands, devising a priority list for sites to be protected or restored, and adapting measures to local conditions.

A landscape perspective is essential for taking geographical differences and human influences into account when priorities are established. By

planning on the basis of landscape ecology, especially valuable core areas can be preserved and strengthened, fragmentation can be prevented, and the hydrological functions of wetlands be taken into account. Planning facilitates the co-ordination of measures for maximum cost-efficiency.

The EU Water Framework Directive concerns management of water resources based on a river basin perspective. That work should be co-ordinated with other comprehensive ecological planning, for example the regional landscape strategies. To achieve good water status in accordance with the directive, it may be necessary to protect, restore and, in some cases, establish new wetlands. In order to ensure that various types of wetland are represented, co-ordination between adjoining river basins is important. One possible approach for activities related to the framework directive is to integrate the planning of wetland restoration into the design of programmes of measures to achieve good status of waters.

## Measures

- Regional landscape strategies or corresponding planning processes should be drawn on in the establishment and restoration of wetlands, and in efforts to balance the various interests involved. Likewise, such strategies or processes should form the basis of conservation measures and increased consideration to the natural and historical environment by the various interests that lay claim to use wetlands, for example as basic data in the early stages of consultation processes.
- A pilot project, based on ecological landscape planning with an emphasis on aquatic environments, should be carried out.
- Restoration and establishment of wetlands should be considered as measures to help fulfil the objectives of the Water Framework Directive.



## Sustainable Use of Wetlands

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Utilization of wetlands should be based on the principle of sustainable use, and conform to the Ramsar Convention's central pillar of wise use. When planning any form of exploitation, the values of wetlands should be assessed within a regional or biogeographical perspective. In areas where the hydrology of a large portion of wetlands has been affected by human activities, additional impacts should only be permitted if there is an overriding public interest and the possibilities of compensatory measures shall be taken into account. It is important that evaluation and prioritization of valuable natural and cultural heritage features in the landscape are conducted at an early stage of the consultation process. The expert advice, supervision and monitoring efforts of public agencies are important. Further, sustainable use of wetlands in agricultural landscapes often requires active measures such as haymaking and grazing.

Wetlands offer good opportunities for hunting, fishing and other forms of outdoor recreation. This is useful in gaining support for nature conservation and cultural heritage preservation efforts. Hunting may have a disrupting effect by making it impossible for wetland birds to use important stop-over sites, among other things. Properly organized, however, hunting can often take place without significant disturbance to wetland birds.

Wetlands with very high nature conservation and cultural heritage values (those in category 1 of the national wetland or wetland forest inventories) should be preserved. Wetlands with high nature conservation and



cultural heritage values (category 2 of the national wetland or wetland forest inventory) should as far as possible be protected from encroachments.

## Measures

### Permits

- When processing applications for permits and exemptions concerning wetlands with high values or wetlands with intact hydrology, responsible authorities should be restrictive in allowing activities that may have negative impacts.
- As a condition of any permit for activities which may cause damage to wetlands with high nature conservation values, the granting authority should require compensatory measures according to Chapter 16, Section 9, of the Swedish Environmental Code.
- It should be investigated whether or not to establish a system for payment of compensation to be used as a condition of permits to encroach upon wetlands. The inquiry should also study the possibility of co-ordinating such a system with the existing fund for community indemnity fees for compensating exploitation of rivers and lakes.

### Notification

- A notification requirement for clearing ditches and natural watercourses should be considered. The purpose of such a requirement would be to avoid problems of unintentional land drainage such as increased dimensions of

the ditch or clearing when a new natural state<sup>2</sup> has occurred. A notification requirement would provide increased opportunities for advice and inspection, and could help to ensure greater compliance with the regulations that apply. The notification process would also provide opportunities to monitor the extent and quality of clearing measures.

### Forestry

- Before forestry procedures are decided upon and carried out in wetland forest, the forest should generally be classified according to the criteria of the Swedish Forest Agency's wetland forest inventory (Skogsstyrelsen Meddelande 3-1999).
- Environmental goals<sup>3</sup> should be established for wetland forest with high nature conservation values (inventory categories 1 and 2), and they should either be set aside from forestry or be given an adapted management. Many sites in category 1 are unspoiled wetland forests. Unless they need to be managed in order to preserve cultural heritage features, such areas should be allowed to develop naturally in order to retain or, over a long period, develop the character of pristine forest. Sites in categories 1 and 2 should be classified as NS or NO-stands. Forestry measures which result in drastic changes in the hydrological conditions or biological composition of wetland forest should not be used in such areas. In most cases, extensive forestry activities which retain forest continuity can be accepted in wetland forests of category 2.
- Other wetland forests (categories 3 and 4) should be managed and utilized with methods that are suited to the stand site. The environmental consideration applied in the forestry sector in connection with regeneration felling is also valuable.

### Forest Roads

- Construction of new forest roads has decreased. But due to inadequate planning and co-ordination, too many roads are sometimes built in relation to the total area to be served. Financial support for planning and co-ordination among forest owners is therefore urgent.

<sup>2</sup> According to the Swedish EPA's general guidelines 96:3 on land drainage, clearing of ditches when a new natural state has occurred is considered as land drainage. A new natural state is when flora and fauna, or the natural environment in general, has changed since the last clearing, and when repeated clearing or drainage ditching would lead to the disappearance of this natural state.

<sup>3</sup> The Swedish Forest Agency has elaborated the Green Forest management plan, where forest stands are divided into four classes based on the stands production and environmental values: PG - production goals with general environmental considerations; PF - production goals with reinforced considerations; NS - environmental goals with adapted management; NO - environmental goals with undisturbed forest.

### Damage from off-road vehicles

- Damage to wetlands caused by off-road vehicles can have very negative effects on their hydrology, which is a problem especially in forestry. In order to avoid such damage, vehicles should if possible be operated on frozen ground, and efforts to educate vehicle operators and felling planners should be increased.
- There is a trend of increasing damage from off-road driving on snowless ground, especially in the mountain areas. It is urgent that permitted use of off-road vehicles, in connection with reindeer herding for example, is conducted in a manner which minimizes damage. One useful approach might be to identify suitable vehicle routes in consultation with the County Administrative Board.

### Mire protection plan and peat extraction

- All mires included in Sweden's Mire Protection Plan shall be exempted from peat extraction. The same applies to mires of great nature conservation and cultural heritage values, and to those in which the hydrology remains largely intact. Mires that have been heavily affected by, for example, ditching or incomplete previous harvesting of peat should primarily qualify for peat extraction.

### Liming

- The guidelines in the Swedish Environmental Protection Agency's handbook on liming should be followed. Among other things, this means that highly valuable wetlands should not be treated with lime, and that liming of previously un-limed wetlands should be avoided. If wet woodlands are limed, measures should be planned with great care.

### Outdoor recreation, hunting and fishing

- In order to reduce the risk of disturbance in bird-rich areas, visitor traffic should be channelled, a practice that has been shown to have positive effects. Hunting should be conducted so as to minimize its impact on wetland birds. With regard to fishing, the Swedish National Board of Fisheries' strategy for introduction and transfer of fish should be followed, and no fish should be introduced in waters that are naturally devoid of fish.
- Damage to wetlands caused by off-road vehicles on snowless ground remains for a long time. The question of whether County Administrative Boards should be empowered to restrict currently permitted off-road driving, for example in connection with the collection of felled game, should be investigated.



## Conservation of Wetlands

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In this context, long-term protection of wetlands refers to such areas that are legally protected as national parks, nature and cultural reserves, habitat protection areas, permanent ancient remains, Natura 2000 sites with established management plans, and nature conservation agreements (according to § 3, Part 7 of the Swedish Code of Land Laws). In the work of legal protection, the sites included in the Mire Protection Plan and the Natura 2000 network have priority. In particular, the threats and management needs of individual sites shall be taken into account. Rich fens are among the habitat types that require special attention in this regard.

The baseline inventory of protected areas and Natura 2000 sites being conducted during 2004-2008 will provide information on e.g. distribution and extent of various types of wetland. Based on the inventory data, the need for restoration and management in national parks, nature reserves and Natura 2000 sites can be analysed. This should be the basis for priorities and long-term cost estimates in the planning of conservation measures in protected wetlands.

The need to exempt wet woodlands with high conservation values from logging by means of formal protection and voluntary set-aside is addressed by interim target 1 of the environmental quality objective Sustainable Forests. The formal protection referred to in interim target 1 will be specified by the County Administrative Boards and the Swedish Forest Agency, in the county-by-county strategies for protection of forests. Nature reserves,



habitat protection areas, nature conservation agreements and voluntary set-aside are the instruments that should be used to exempt relevant areas from forestry.

## Measures

### Protection

- All Ramsar sites should be given priority in the ongoing work of preservation by including them on the list of areas of unspoiled nature in accordance with Chapter 7, Section 27, Part 1 of the Swedish Environmental Code.
- The Swedish Environmental Protection Agency conducts a review of the Mire Protection Plan in co-operation with the County Administrative Boards during 2006.
- In order to achieve Interim Target 2, long-term protection shall be accorded no later than 2010 to the mires included in the 1994 Mire Protection Plan, and to the mires which replace those removed from the plan during the ongoing review. Protection of additional mires designated in the revised plan should be implemented by 2015.

### Knowledge

- New estimates of the extent and distribution of various wetland types should be made in order to determine whether the long-term protected wetlands comprise a representative sample.
- Guidelines for the consideration and prioritization of valuable cultural heritage features in connection with conservation of wetlands should be developed, among other things in order to improve maintenance of historical remains, including such heritage elements as barns, hay-drying racks and fences.
- The work of preserving and restoring grazing land and hay meadows in accordance with the environmental quality objective A Varied Agricultural Landscape is a prerequisite for achieving the objective of Thriving Wetlands. Agri-environmental measures for such areas is very important. Since moist and wet grasslands can require a relatively great deal of management, it is important that higher support continues to be paid for the maintenance of valuable meadows and grazing lands. There is also a need for the continuation of advisory services for the restoration and management of meadows and grazing land.



## Restoration and Establishment of Wetlands

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### Definitions

**Establishment:** Creating a wetland on land that is otherwise not regarded as wetland. Re-establishment involves measures for that purpose on land which has previously been a wetland or lake. New establishment involves measures on land which has not previously been a wetland or lake. The measures employed include filling in ditches, damming and digging.

**Restoration/Rehabilitation:** Improving existing wetland by means of changes to hydrology and/or removal of vegetation. Changes to hydrology may include filling in ditches, damming and digging.

The need for restoration and establishment of wetlands is judged to be greatest in agricultural landscapes. Such measures are also needed in mires, wet woodlands and other wetland habitats. In agricultural landscapes, there is a need for restoration and establishment of both aquatic habitats and of traditionally grazed and mowed wetlands. Active restoration measures in wet woodland is deemed to be of lower priority, but the need for restoration requires to be investigated. The need for restoration of mires is judged to be great, but the knowledge concerning hydrological restoration techniques needs to be strengthened.

Achieving the environmental quality objective requires, among other things, the restoration and establishment of wetlands to such a degree that sufficient habitat is provided to ensure the survival and distribution pos-

sibilities of wetland species within their natural ranges.

Another purpose of restoring and establishing wetlands is to retain plant nutrients and thus help to fulfil the environmental quality objective Zero Eutrophication. The Swedish Board of Agriculture has calculated that, assuming 175 kilograms of nitrogen per hectare are removed annually, 12,000 hectares of wetlands will have to be established by 2020 in order to reach the overall goal for nitrogen retention.

In total, 3,600 hectares of wetland were established or restored in agricultural landscapes during 2000-2004. If that rate continues, the total by year 2010 will be around 8,000 hectares, which is far short of the national objective of 12,000 hectares. Studies of wetlands established with state financing indicate that their quality and cost-efficiency with regard to the retention of plant nutrients would increase if there were better possibilities for directing the location of such wetlands.

#### Preconditions for fulfilling interim target 4 and other objectives related to rehabilitation

- Increased pace in implementation of measures.
- Greater emphasis on restoration of existing wetlands and on careful re-establishment of wetlands, with long-term management in mind.
- Better conditions for high rate of plant nutrient retention and for biodiversity through direction of wetland placement and an increased number of larger projects.
- Greater consideration to valuable cultural features in the landscape. This means harmonizing placement, design and management of wetlands with the landscape to the greatest possible extent, and avoiding measures that damage or alter historical remains or landscape features.
- Increased co-ordination between the interests of fishery and nature conservation in the planning of measures.

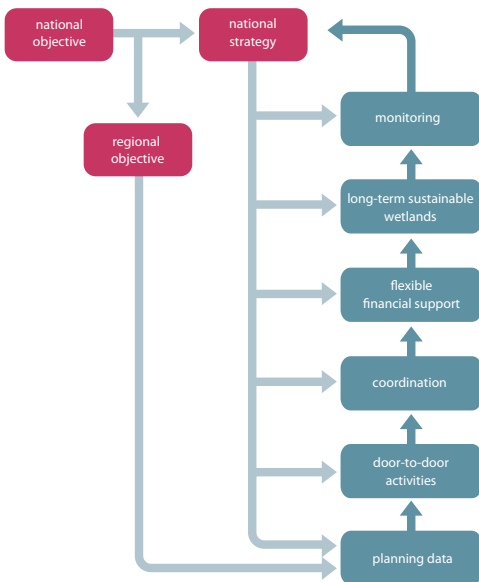


Figure 1. The wetland chain. In order to fulfil the targets for total area and high quality of restored and established wetlands, all links in the chain need to be developed and to be available.

## A procedure for restoring and establishing wetlands

### Priorities

- At the national level, priority is given to the wetland types that are most threatened and to those which have disappeared to the greatest extent.
- Measures should be concentrated to regions where many wetlands have been lost.
- Within regions, priority should be given to types of wetland whose total area has greatly diminished.
- Restoration and management of traditionally mowed areas is particularly important, as the total area of such land has been greatly reduced.

All measures are connected with a “wetland chain” (see Figure 1) whose purpose is to provide a rational working procedure that will result in high-quality wetlands. The procedure facilitates the balancing of various interests, and makes it possible to direct measures to areas where optimal gain can be achieved. State-financed development of regional landscape strategies and planning of wetlands within a landscape perspective are important components. With increased resources for door-to-door activities, co-ordination and flexible financial support, local participation can be taken care of and stimulated.

This working procedure, which places a strong emphasis on strategic planning, also makes it possible to adopt a comprehensive approach which takes ecological, water-conserving and cultural heritage aspects into account, along with needs for land and water use and recreation.

### Measures

#### Planning

- The County Administrative Boards should compile data to be used as a basis for planning of establishment and restoration of wetlands. The data can be used to identify areas that are especially significant for rehabilitation of wetlands, and to provide a basis for meeting various objectives and interests. The planning should be done in consultation with water authorities, municipalities and other parties involved. It should also be integrated into other forms of landscape planning, nature conservation, cultural heritage conservation, and planning of water resources. The planning data can be included in the regional landscape strategies developed by County Administrative Boards in accordance with the government bill 2004/05:150. Planning data should be compiled during 2007-2008, as it is essential to the other links in the wetlands chain.



- The Swedish Environmental Protection Agency will, in co-operation with other authorities concerned, develop guidelines on planning establishment and restoration of wetlands.
- Fisheries conservation measures should be incorporated into the work of rehabilitating wetlands, inter alia through ecological landscape planning.

#### Development of methods

- Various restoration methods should be tested and evaluated in pilot projects in various types of mires and wet woodland in order to provide a basis for e.g. calculation of costs.

#### Financing and compensation

- In order to fulfil the area target with high quality wetlands, there is a need for increased budget allocations to the Agro-environmental and Rural Development Programme (ARD), or supplementary national funds. Resources are also needed to evaluate the effectiveness of measures, among other things in order to assess the need for changes in economical instruments.
- A large portion of the wetland chain should be financed through the ARD Programme, which should receive supplementary national funds via the municipalities, for example in connection with local conserva-

tion projects. This is an urgent matter, since the municipalities are important actors in the planning of land use and of water resources. It is also important for sustaining the interest in wetlands that many municipalities have developed in connection with local investment programmes (LIP). In some cases, measures can also be financed with funds allocated for protected areas and endangered species; but this applies primarily to measures that do not fit within the framework of the ARD Programme.

- Door-to-door activities and co-ordination can be included in the ARD Programme and also financed with national funding administered by municipalities. It should be possible to provide compensation via the ARD Programme for establishment, restoration and management of wetlands throughout the country, and should in some cases apply to measures in areas beyond the margins of agricultural land. Compensation to those who own and use the land needs to be flexible with regard to levels of support and eligible costs.
- The support system should be designed to satisfy the particular needs of various regions, for example the need for establishment of new wetlands in southern Sweden and for the restoration of hay marshes in the northern part of the country.

#### Legal aspects

- In order to promote the re-establishment and restoration of aquatic habitats, it may be necessary to clarify the importance of the environmental quality objectives in connection with implementation of the Environmental Code. It is important to indicate how environmental benefits should be assessed and weighed against e.g. economic interests and potential damage to fisheries. Guidelines on the co-ordination of fishery conservation measures with the re-establishment of wetlands should be developed.
- The environmental quality objectives should be taken into account in permit application procedures concerning water operations for the purpose of establishing and restoring wetlands in aquatic habitats in which hydrological conditions have been strongly affected by human activity. The Environmental Code should be applied in the assessment of costs and benefits so that benefits to nature and cultural heritage are also taken into account.
- In order to ensure the functions and values of restored and newly established wetlands over the long term, supervisory authorities should be restrictive in permitting activities with potentially negative impacts on wetlands.

- Changes in drainage enterprises are often legally complicated, posing an obstacle to the re-establishment of wetlands. However, the thousands of drainage enterprises in Sweden comprise a potential means of restoring wetlands. The question of whether legal and administrative regulations need to be changed, in order to facilitate the conversion of drainage enterprises into projects for the restoration and establishment of wetlands, should be investigated.
- The Swedish Environmental Protection Agency has been directed by the government to study the possibility of using nature conservation agreements in other biotopes than forest. It should be considered whether or not such agreements may serve as an appropriate complement to the wetland measures of the ARD Programme, and include measures that cannot be financed with ARD funds.
- The Swedish Environmental Protection Agency has proposed that shore environments and aquatic habitats with populations of endangered or near threatened species, or which are essential to the survival of certain species, may qualify for designation as habitat protection areas by County Administrative Boards or the Forest Agency. The proposal is currently being reviewed by the Government Offices. In this context, it is desirable to consider the question of whether the instrument of habitat protection could be applied to restored and established wetlands that have come to provide habitats for endangered or near threatened species.
- The implications of the general habitat protection regulations for wetlands and small surface waters less than 1 hectare, should be investigated with regard to restored and established wetlands.



## Knowledge and Information

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In the long term, it is essential to the fulfilment of several environmental quality objectives that a majority of citizens have good knowledge of, active interest in, and strong feeling for valuable natural and cultural heritage features in the landscape. Increased awareness among authorities and the general public of wetlands' various functions is likewise important for achieving the objective of Thriving Wetlands. The spread of knowledge and information is essential in this regard. Continued research and accumulation of knowledge are additional prerequisites for a successful outcome. The relevant sectors of society and voluntary organizations also have a responsibility for the accumulation and spread of the necessary knowledge for society to implement the measures required to fulfil the objectives. As part of an EU project, the County Administrative Board of Västra Götaland is studying the requirements for establishment of a wetland centre.

For wetlands to be preserved and utilized in a beneficial manner, more knowledge is required concerning the total area of wetland that has been lost, how much remains today, its distribution in terms of size categories and types of wetland habitats, where they are located, how they are used, and what valuable features they contain. There is also a need for additional knowledge about the effects of various types of use, and of restoration and establishment.



## Measures

### Follow-up and reporting

- A national system of satellite-based monitoring of wetlands, based on the Swedish Wetland Inventory, should be established. The National Inventory of Landscapes in Sweden should be further developed to supplement the remote sensing system with spot-checks. Certain species categories and habitats, such as rich fens, require special monitoring measures.
- Field-based methods that have been developed shall be used in monitoring the preservation status of Natura 2000 sites and other protected wetlands.
- A national report of the Swedish Wetland Inventory, including suggestions on how its findings can be utilized, should be produced. The inventory database is available on the Internet and will, together with digital map overlays currently being prepared, provide a key source of information for inter alia ecological landscape planning and permit application procedures.

### Compiling knowledge and spreading information

- There is a need to assemble and disseminate information and knowledge regarding which wet woodlands ought to be preserved, and how they should be utilized.
- Within the agricultural sector, there is a need for continued counselling on the restoration and management of moist and wet meadows and grazing lands.
- In order to ensure the care and protection of valuable cultural heritage on wetlands, all relevant knowledge needs to be compiled and inventories of certain wetlands need to be conducted. Available knowledge on valuable cultural heritage on and near wetlands should be compiled and analysed. The FMIS (digital Record of Archaeological Sites and Monuments) and the Forest & History Inventory should be comparatively studied with for example, the Swedish Wetland Inventory.
- It should be possible to increase the use of historical maps in planning the protection, management, restoration and establishment of wetlands and other habitat types. Analyses based on such maps can be used by a wide range of interests. Carrying out analyses of larger sections of landscape as a basis for ecological planning should be considered.



#### Research and documentation

- More research is needed to clarify the effects on flora and fauna of encroachments as well as management and restoration measures. It is also necessary to monitor the effects of various types of disturbance to wetlands, such as forest roads and clearing of ditches.
- Activities that alter the hydrology of wetlands may in some cases result in a significant net increase in releases of greenhouse gases. Drainage on a larger scale and clearing of ditches should be avoided if the risk for large net increases in greenhouse gas releases is judged to be high. There is a need for continued studies of the extent to which various wetlands take up and release greenhouse gases, and of the effects of various measures on wetlands in this regard.
- Provision for documentation of outcomes should be included in the planning of all projects for establishing, restoring and/or managing wetlands.



Due to its great wealth of wetlands, Sweden has an international responsibility to use wetlands wisely and preserve them for future generations. As a signatory of the Ramsar Convention, Sweden is committed to preserving wetland areas of exceptional value. In the international perspective, Sweden particularly has a responsibility concerning conservation of mires.

### Measures

- Additional Ramsar sites should be proposed for central and northern Sweden.
- Current guidelines for implementing the convention on Sweden's Ramsar sites should be revised.
- Knowledge concerning the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA), should be disseminated by means of an official translation of the text into Swedish.

## Sweden's International Responsibilities

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## Strategy for Thriving Wetlands – Roles and Responsibilities

In connection with the forthcoming in-depth evaluation of the national environmental quality objective, the Swedish Environmental Protection Agency, Board of Agriculture, Forest Agency and the National Heritage Board plan to cooperate on an assessment of the need for changes to the relevant legislation and, if deemed appropriate, develop proposals for specific changes. The evaluation will include consideration of the needs and possibilities for:

- facilitating the conversion of drainage enterprises to wetland re-establishment projects. Lead agency: the Environmental Protection Agency.
- clarifying the meaning of the concept “new natural state”. Lead agency: the Environmental Protection Agency.
- introducing a notification requirement for clearing of ditches. Lead agency: the Forest Agency, in consultation with the County Administrative Boards.
- use the community indemnity fees for compensating exploitation of wetlands. Lead agency: the Environmental Protection Agency, in consultation with the County Administrative Boards.

**The Swedish Environmental Protection Agency** is responsible for:

- developing proposals for principles concerning measures to compensate for disturbances to wetlands; in co-operation with Banverket (the

national rail traffic authority), the Swedish Road Administration and the County Administrative Boards.

- investigating the implications of general habitat protection for wetlands and small surface waters less than 1 hectare, with regard to restored and newly established wetlands.
- revising the guidelines for Sweden's Ramsar sites.
- proposing additional Ramsar sites, primarily in central and northern Sweden; in co-operation with the County Administrative Boards.
- revising the Mire Protection Plan during 2006; in co-operation with the County Administrative Boards.
- developing more precise information about the total area of various wetland habitats in Sweden, as a basis for determining if the wetlands that have long-term protection constitute a representative sample.
- based on the base-line inventory of protected areas to be conducted during 2004–2008, analysing the need for restoration and management of national parks, nature reserves and Natura 2000 sites.
- organizing a pilot project based on ecological landscape planning, with a focus on aquatic habitats and involving a broad range of interests.
- developing guidelines for co-ordinating fisheries conservation measures with the re-establishment of wetlands; in co-operation with the Swedish Board of Fisheries.
- developing guidelines for how the planning of restoration and establishment of wetlands should be conducted at the regional level and be co-ordinated with other planning activities; in co-operation with the Swedish Board of Agriculture, the National Heritage Board and the County Administrative Boards.
- together with the County Administrative Boards concerned, initiating pilot projects for the restoration of mires and, in consultation with the Swedish Forest Agency, initiating pilot projects for the restoration of wet woodlands.

**The Swedish Forest Agency** is responsible for:

- contributing to the forthcoming in-depth evaluation of the national environmental quality objective with an assessment of the need for restoration of wet woodlands.
- initiating pilot projects for the restoration of wet woodlands.
- striving to reduce the negative effects of forestry activities on wetlands, lakes and watercourses, by means of information, counselling and supervision.
- participating in the monitoring of the effects of forest roads on wetlands.

**The Swedish Board of Agriculture** is responsible for :

- providing counselling to landowners with regard to restoration, establishment and management of wetlands, within the framework of the Agro-Environmental and Rural Development Program.
- developing guidelines for how the planning of restoration and establishment of wetlands should be conducted at the regional level and be co-ordinated with other planning activities; in co-operation with the Swedish Environmental Protection Agency, the National Heritage Board and the County Administrative Boards.

**The National Heritage Board** is responsible for:

- developing guidelines for surveying the cultural heritage values of wetlands and for the prioritizing of these values in connection with conservation of, and impacts on, wetlands.
- developing guidelines for how the planning of restoration and establishment of wetlands should be conducted at the regional level and be co-ordinated with other planning activities; in co-operation with the Swedish Environmental Protection Agency, the Swedish Board of Agriculture and the County Administrative Boards.

**The County Administrative Boards**

- should compile data to be used as a basis for planning of restoration and establishment of wetlands.
- are responsible for the protection and management of e.g. valuable wetlands.
- implement the protection of wetlands designated by the Mire Protection Plan
- distribute funds from the Agro-Environmental and Rural Development Program for restoration, establishment and management of wetlands.

**The water authorities**

- should, in their management plans, take into account the potentials of wetlands in efforts to fulfil quality objectives for water bodies.

**Banverket (the national rail traffic authority) & the Swedish Road Administration**

- co-operate with the Environmental Protection Agency in developing principles for compensation measures.
- develop goals and criteria for measures to avoid damage to wetlands.

**The Swedish Board of Fisheries**

- participate in the development of guidelines on how fisheries conservation measures can be co-ordinated with and integrated into the work of re-establishing wetlands.
- participate in the planning of restoration and establishment of wetlands at the regional level.

**Municipalities**

- plan for good management of wetland resources and make use of available funding for wetland conservation measures.
- contribute to effective public information on the value of wetlands.

**Non-profit organizations**

- conduct information campaigns about wetlands, their values and wise usage; and also participate via foundation activities, financial support and lobbying.

**Owners and users of land, and drainage enterprises**

- decide whether land uses shall be altered or adjusted in order to help fulfil the objective of Thriving Wetlands, and participate in a dialogue on such matters with public authorities and other interested parties.

# National strategy for Thriving Wetlands

The Swedish environmental quality objective Thriving Wetlands states that *“The ecological and water-conserving function of wetlands in the landscape must be maintained and valuable wetlands preserved for the future”*. With the aim to establish the necessary conditions for achieving the objective, a common approach has been adopted by the Swedish Environmental Protection Agency, the Swedish Board of Agriculture, the Swedish Forest Agency and the National Heritage Board.

This strategy document deals with the sustainable use, conservation, restoration, establishment and management of wetlands in Sweden. The primary purpose is that it shall serve as a foundation for decisions concerning wetland resources on a national, regional and local level. The strategy will thereby contribute to the fulfilment of Sweden’s obligations under the Ramsar Convention and the Convention on Biological Diversity.

